1-1-2001

Financial intermediation and economic performance in Zimbabwe

Gift Chirozva
Edith Cowan University

Recommended Citation

FINANCIAL INTERMEDIATION AND

ECONOMIC PERFORMANCE IN ZIMBABWE

By

Gift CHIROZVA   Mbus (Finance) *ECowan*

A Thesis Submitted in Partial Fulfillment of the Requirements for the

Award of Master of Business - Finance

At the Faculty of Business and Public Management,

Edith Cowan University, Perth, WA, Australia

Date of submission: December 2001

USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

ABSTRACT

Financial literature is replete with theoretical and empirical evidence suggesting financial development has a causal effect on economic growth. Yet there is no consensus on the finance-growth nexus. The direction of causality is still controversial. In fact, classical economists argue that financial factors are neutral and hence cannot have real effects. Critics argue the traditional methods of identifying long run economic relationships fail to address the methodological conflict between equilibrium implied by theory and the disequilibria in the data. The rise of new representation techniques such as the General Methods of Moments (GMM) and vector autoregression [VAR] brought with them empirical flexibility, which facilitates the re-examination of several theories. VAR characterization permits the economic system to determine the behavior of macroeconomic variables simultaneously. The endogenous growth theoretical literature gives credibility to system-wide VAR financial models.

This research is both critical (in its search for a common framework to inform debate on Zimbabwe) and positive (to the extent it undertakes an empirical investigation.) Empirically, the study examines the nature and intensity of links between financial intermediation and economic performance in a small developing economy. A Vector Autoregressive [VAR] framework is applied to model and estimate the temporal and dynamic relationships between financial aggregates and economic activity. Cointegration among the variables is examined to determine the degree of heterogeneity and coevolution. The general impulse response function [GIRF] and variance decomposition [VDC] analytical techniques are applied to throw light on the speed and direction of the causal links and the persistence of shocks over time.

Branches of financial theory, e.g. agency risk, corporate governance and information asymmetry have taught us economic activity does not take place in a vacuum or perfect market. To put this research into perspective, the study critically examines the evolution of Zimbabwean institutional structures in

3

search of a new conceptual framework with potential to inform debate. The works of Levine (1997, 1998) LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997,1998, 2000), Beck, Levine and Loayza (2000), Kane (1981, 1983, 2000) Jensen and Meckling (1976) and Stiglitz (1989) give considerable prominence to governance and institutional design. Allen and Gale (1994, p10) emphasized that institutional settings underlie the process of financial innovation. In fact, Schumpeter (1954, p12) exalts history, statistics and "theory" as the three pillars of economic analysis. Stiglitz (1989, p199) agrees that particular localized historical events could have permanent effects. More recently, Beck, Demirgüç-Kunt and Levine (2001) summarized the theory and provided an empirical examination of the links between laws, politics and finance.

DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

(i)   incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education;

(ii)   contain any material previously published or written by another person except where due reference is made in the text; or

(iii)   contain any defamatory material.

Signature

Date   24 December 2001

5

ACKNOWLEDGMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

GLOSSARY OF MAJOR TERMS AND CONCEPTS

Cointegration exists if, and only if, there is a weighted combination of integrated variables that is driven by common trends. (See Verbeek 2000 Ch. 9)

Corporate governance collectively refers to the internal and external management of non-trading risk and competing interests within institutions. Most problems emanate from the separation of ownership from management and information asymmetries.

Economic development, in Kindleberger and Herrick's (1977, p1) view, includes improvements in material and general welfare; the eradication of mass poverty with its correlates of illiteracy, disease, and early death; shifts from agricultural toward industrial activities; promotion of high employment; and greater participation in economic decision making process and otherwise.

Economic growth is usually measured by the rise in GDP or GDP per capita over time. The growth rate depicts the rate of change over two time periods.

Financial intermediation is the process of mobilizing financial assets from many depositors (or savers) and the conduct of separate and independent contractual transactions with borrowers. Financial intermediaries "go between" economic units with surplus financial assets and borrowers in need of financial resources for investment and / or other transactions.

Underdevelopment denotes poorly developed and undiversified economic sectors; over reliance on production of primary products; as well as economic domination by external market forces. Mass poverty; foreign currency shortages; debt and balance of payment crisis are also common features.

Vector autoregression is a multivariate econometric process, which estimates the temporal fluctuations and dynamic interdependence among current and past realisations of variables in a time series vector up to a specified lag length.

MAIN ACRONYMS AND ABBREVIATIONS

CIC – Currency in Circulation

CMB – Commercial Banks

CMLA – Commercial Banks Loans And Advances

CPI – Consumer Price Index

DFI – Development Financial Institutions

DH – Discount Houses

DMB – Deposit Money Banks

FH – Finance Houses

FSB – Fiscal Balance

GDP – Gross Domestic Product

INS – Insurance Companies

LQL – Liquid Liabilities

MB – Merchant Banks

MDC – Movement for Democratic Change

NBFI – Non Bank Financial Institutions

NCD – Negotiable Certificates of Deposits

OBI – Other Banking Institutions

POIVAD – Patronage, Ostracism, Impunity, Violence And Demise

POSB – Post Office Saving Bank

PCDMB – Private Sector Credit by DMB

PSC – Private Sector Credit

RBZ – Reserve Bank of Zimbabwe

SMC – Stock Market Capitalisation

TB – Treasury Bills

ZANU PF – Zimbabwe African National Union (Patriotic Front)

ZAPU – Zimbabwe African People's Union

ZDB – Zimbabwe Development Bank

ZSE – Zimbabwe Stock Exchange

ZW or ZWE – Zimbabwe, formerly Rhodesia prior to 1980

HRE – Harare, capital city of Zimbabwe formerly Salisbury

Economists and politicians from all nations rich and poor, capitalist, socialist and mixed, have worshipped at the shrine of economic growth

Michael Todaro (1994, p99), *Economic Development*, Longman.

For as long as we are unable to put our arguments into figures, the voice of our science, although occasionally it may help dispel errors, will never be heard by practical men."

Schumpeter (1933, p12), Econometrica, (first issue).

1. INTRODUCTION

*Economists and politicians from all nations rich and poor, capitalist, socialist
and mixed, have worshipped at the shrine of economic growth,*

Michael Todaro, (1994, p99)

There is a growing theoretical and empirical interest in the pedagogic
value of financial aggregates in relation to economic growth. In fact, financial
aggregates constitute the core of observational data collected all over the world.
Three competing but not necessarily mutually exclusive hypotheses can be
identified in the literature. Firstly classical economists argue finance has no real
effect; it actually follows income. Secondly many financial economists find fi-
nance has a causal effect on growth. The third view either takes causality to be
mutual or argues that finance is detrimental to growth. The continual emergence
of new and more sophisticated techniques, as well as broad datasets, facilitates
a rich reappraisal of this unsettled debate. This study therefore examines
whether financial intermediation aggregates contain statistically significant in-
formation about economic performance or movements in real income.

Recent evidence from Latin America and South East Asia demonstrates
that a financial crisis can arise from (1) a currency crisis, (2) banking crisis (3)
debt crisis or (4) stock market crashes. Most empirical studies are myopic in
orientation hence the necessities for a broader focus. Researchers of different
persuasions either exclusively focus on banking aggregates or stock market ac-
tivity. Financial intermediation literature is preoccupied with the size, organisa-
tion and stability of the banking sector. Empirical research in financial markets is
preoccupied with the predictability of stock prices. Mills (1993, p3) cautions:

> We should avoid giving the impression that the only financial time
> series of interest are stock prices. There are financial markets
> other than those for stocks, most notably for bonds and foreign
> currency, but there also exist the various futures and commodity
> markets all of which provide interesting and important series to
> analyse.

It is important to stress that the financial sector consists of banks, non-bank financial institutions (NBFIs) and equity markets. Beck, Demirgüç-Kunt, and Levine (1999, p2) note that banking sector development and stock market development both "exert a causal impact on economic growth." Conventionally financial development is measured in terms of size, activity and efficiency.

This thesis systematically relates economic performance to long run development in banks, NBFI, and the stock exchange in a Zimbabwean context. The study amalgamates indicators such as size, activity, and efficiency from various sources such as Beck, Demirgüç-Kunt, and Levine (1999), Lynch (1993, 1994), Levine (1998), and Rousseau P. L. and Wachtel P. (1998). Demirgüç-Kunt, and Levine (1999, p3) regard a country's financial system to be underdeveloped "if it has below median values of <u>both</u> bank and market developments" on a global scale. In practical terms both the claims of Deposit Money Banks (DMB) on private sector to GDP and the total value of securities traded to GDP are less than the global mean. Generally, the classification produces three categories of financial structure viz. (a) underdeveloped, (b) bank based and (c) market based. Due to practical complications Table 1 portrays four types of financial structure to distinguish the relative strengths of markets and institutions in less sophisticated financial systems.

Financial intermediation should be of major concern given the current emphasis on the importance of private sector participation in economic development. This process was further strengthened by the demise of most command economies at the end of the Cold War. Hellwig (1991), cited in Freixas and Rochet (1997, p7) stresses that banks exert a fundamental influence on capital allocation, risk sharing and economic growth. Jayaraman (1996, p 1), citing Killick (1993) adds:

> The ... private sector cannot function unless there is a well-lubricated financial system in place because, unlike the public sector, it cannot raise resources through taxation or from money creation. It must save or borrow to invest and the financial sector facilitates these tasks.

Policy makers and applied economists additionally believe fluctuations in financial variables have real effects both in the short run (stabilization) and in the long run (growth) and hence warrant close attention. Multinational entities

Table 1

Country Classification of Financial Structure

Financially underdeveloped economies		Financially developed countries	
Country name	Structure Index	Country name	Structure Index
Bank-based economies		**Bank-based economies**	
Bangladesh	-0.90	Panama	-0.92
Nepal	-0.87	Tunisia	-0.88
Egypt	-0.82	Cyprus	-0.77
Costa Rica	-0.79	Portugal	-0.75
Barbados	-0.78	Austria	-0.73
Honduras	-0.75	Belgium	-0.66
Trinidad & Tobago	-0.74	Italy	-0.57
Mauritius	-0.70	Finland	-0.53
Kenya	-0.69	Norway	-0.33
Ecuador	-0.56	New Zealand	-0.29
Sri Lanka	-0.54	Japan	-0.19
Indonesia	-0.50	France	-0.17
Colombia	-0.47	Jordan	-0.14
Pakistan	-0.38	Germany	-0.10
Zimbabwe	-0.34	Israel	-0.06
Greece	-0.34	Spain	0.02
Argentina	-0.25		
Venezuela	-0.15	Group mean	-0.44
India	-0.14		
Ireland	-0.06	**Market-based economies**	
		Netherlands	0.11
Group mean	-0.54	Thailand	0.39
		Canada	0.41
Market-based economies		Australia	0.50
Denmark	0.15	South Africa	0.83
Peru	0.16	Korea	0.89
Chile	0.25	Sweden	0.91
Jamaica	0.28	Great Britain	0.92
Brazil	0.65	Singapore	1.18
Mexico	0.68	United States	1.96
Philippines	0.71	Switzerland	2.03
Turkey	1.23	Hong Kong	2.10
		Malaysia	2.93
Group mean	0.52	Group mean	1.17
Financially underdeveloped countries	-0.24	Financially developed countries	0.28
Overall mean	0.03		

Source: Demirgüç-Kunt A, and Levine R (1999) Table 12.The conglomerate financial structure index is constructed from means adjusted average measures of (a) size-[Capitalization vs. Banks] , (b) activity- [Trading Vs Bank Credit], and (c) efficiency - [Trading vs. Overhead.] A higher relative degree of stock market development in relation to the banking system development results in a higher the structure value. Entries arranged in ascending order of sophistication. The index is however not foolproof.

16

such as the International Monetary Fund (IMF) and The World Bank now routinely include financial liberalization in any serious economic structural adjustment program. Recent projects focussing on financial structure and economic development at the World Bank (Feb 2000) demonstrate the degree of importance the institution attaches to the topic. Mark Gertler (1988, p560), and Freixas and Rochet (1997, p176) concur that policymakers give close attention to financial markets and institutions because they affect real output both in the short run and in the long run. This draws attention to the services financial intermediaries provide to the economy and how they are organized.

Theories of financial intermediation put greater emphasis on the "specialness", information services, liquidity, and economic importance of banks. As instanced by Allen and Gale (1997) the intermediary role of financial markets (eg. stock) is also stressed. The prominence of banks is also highlighted in periods of crises such as the Great Depression that coincided with the collapse of 40% banks and disappearance of 44 % of demand deposits in the US, observed Hixon (1993, p1). According to Friedman and Schwartz (1963) bank failures attenuated the severity of the depression. In all economies financial intermediaries play a vital role in the payment system, liquidity services, asset transformation, risk management, and information services. Financial intermediaries increase productivity by lowering transaction costs; mitigate moral hazard and opportunism; and support commitment through delegation. I discuss the details later on under the literature review.

The opening quotation from Todaro (1994, p99) emphasizes that economic growth is a universal concern for all peoples. Owoye (1997, p71) points out that fluctuations in GDP data depicts "the success or failure of current macroeconomic policies..." Owoye, like Schumpeter (1933) argues that knowledge about the informational content and the predictive power of financial aggregates helps authorities and policymakers to optimise economic decisions. Such information invariably assists authorities in selecting appropriate policy targets. This thesis contributes to increasing scholarly output on financial institutions, capital markets and economic growth. It improves communication between the academic community, financial economists and policymakers. I agree with Bowbrick (1988, p56) that accurate economic analysis can make a difference between life and death among less sophisticated communities.

17

1.1 Background

The role of financial development in economic growth has attracted considerable theoretical and empirical interest in recent years. To put this research into perspective I begin with a brief glance at the overall landscape. This serves to highlight the direction of major studies in this important field.

Martin and Win (1996, p19) suggest that the contribution of the financial sector can be examined at three closely-knit levels:

(I) At a macroeconomic level a positive correlation with economic growth is expected. The contribution of the financial system is affected by its efficiency as measured by "liquidity, volatility, transaction costs and transparency..." (p 5). Poor performance by financial intermediaries retards economic activity.

(II) By quantifying the direct benefits of the financial system. This involves estimation of the value added to jobs, services and products generated by the financial sector. A detailed quantification of processes, service flow, revenues and transaction costs is required to make an accurate assessment. A structural (production) or functional (intermediation) view of the financial system may be used. The perspective of financial structure adopted influences details of what to include in the analysis.

(III) By examining the indirect benefits of the market. Financial development comes with both general and institution-specific benefits to the economy. The general functions provided by financial intermediaries are economies of scale and scope in information services, liquidity services, consumption smoothing, transactions cost, and risk reduction services. Other institution-specific functions include credit allocation; the payment system; money supply transmission; and credit substitution. The actual range of services provided depends on the sophistication and regulation of the financial system in a particular economy.

In practice, level II is difficult to calibrate while paucity of detailed transactions data handicap empirical research. As a result, research grapples with methodological and measurement issues. Apart from Martin and Win (1996), and Brealey and Soria (1993) cited by the former authors, not much research is on record. The nearest studies deal with frontier analysis, also known as x-

18

efficiency. Berger and Humphrey (1997) survey this literature and conclude that various efficiency methods do not lead to identical results because of methodological differences. According to them frontier analysis benchmarks "the relative performance of production units" and evaluates how close they "are to a 'best-practice' frontier" (p4). A parametric or nonparametric representation may be applied depending on assumptions imposed on data, the functional form, and the degree of efficiency. Parametric efficiency analysis specifies a deterministic functional form whereas nonparametric approaches presuppose less structure but do not model random errors. In both approaches some input and output definitional concepts remain controversial. Berger and Humphrey (1997, p32) note:

> The asset, user cost, and value-added methods of assigning financial goods to input and output categories all agree that loans and other major assets of financial institutions should count as outputs. However, there is a longstanding controversy whether deposits should count as inputs or outputs. Deposits have input characteristics because they are paid for in part by interest payments and the funds raised provide the institution with raw material of ingestible funds. However, deposits also have output characteristics because they are associated with a substantial amount of liquidity, safekeeping, and payments services provided to depositors.

The dilemma is resolved by stripping deposits into input (interest paid) and output (amount of deposits) characteristics. Similarly the definition of money supply also wrestles with the categorization of various deposits. Regulatory differences also make cross-country comparisons very difficult.

In the view of Freixas and Rochet (1997, p8) there are five issues at the macroeconomic level that require attention: -

(a)   the transmission channel of monetary policy.

(b)   the fragility of the monetary policy

(c)   the existence of financial cycles

(d)   the real effect (corporate investment) of financial intermediation , and

(e)   the impact of financial intermediation on economic growth.

19

These subsections are major research areas in their own right. Kuh and Meyer (1963) and Elliot (1973), for instance, analyse financial factors in corporate investment. Financial fragility, recessions and crises feature prominently in the works of Kindleberger (1978,1996) and Minsky (1972, 1996).[a] Comparative studies between bank-based and market-based financial system received a fair share of attention but are no longer informative, Levine (2000).

My thesis is restricted to (e) because economic well-being has a universal appeal. It motivates most economic transactions. Indeed Lewis (1995, p18) cited in Martin and Win (1996, p7) reiterates that the financial services industry is the major engine of economic growth. Prior studies directed at the relationship between financial development and economic growth include Schumpeter ([1911] 1936), Gurley and Shaw (1955, 1960), Goldsmith (1969), McKinnon (1973), Shaw (1973), Levine (1991, 1997, 1998) and Beck, Levine and Loayza (2000.)

It was earlier noted that the contribution of the financial sector is affected by the efficiency of the financial intermediaries, characterized by the system's liquidity, volatility, transaction costs and transparency. Financial intermediaries provide economies of scale and scope in addition to acquiring information, mobilising and allocating resources, managing risk, and exerting corporate control. Martin and Win (1996, p12) note that absence of financial intermediaries in the risk management process inhibits economic activity in the same way that the absence of financial intermediaries may inhibit economic activity. Reduction in the level of intermediation activity and liquidity will reduce the contribution of the financial markets to the economy. High transaction and information costs retard economic growth by lowering productivity.

The World Bank (1989, p26) notes that resource accumulation has not predicted growth in the Malthusian context. "In 1870, Australia, a country rich in natural resources, had twice the per capita income of Switzerland, which has few; today Switzerland's per capita income exceeds Australia's by more than half." The report notes that the success of Hong Kong, Japan, South Korea and Singapore does not resemble their resource endowment.

---

[a] Details of these citations and those in the next paragraph are fully discussed under the literature review.

20

In this thesis I posit that the operations of financial intermediaries have a direct impact on overall economic performance. Typical literature and research characterise economic development as a process amenable to sound and proper management and policies. There is no single measure of development because structural issues such as extent of poverty, income distribution, social and political change, literacy, leisure and economic well being come into play.

The financial level of analysis generally equates development to the increase in GDP per capita over time. The economic growth rate is given by the rate of change in GDP per capita over two periods in time. Strictly speaking, there is a distinction between economic development and economic growth. Positive growth rates derived from the GDP indicate economic growth but not necessarily economic development. A growing economy may remain underdeveloped if other indicators highlighted supra are not improving. Conventionally, GDP is accepted as a measure of national income (Y) and economic size while GDP per capita is the most popular proxy for average human welfare. The rate of change in GDP per capita (GY), depicts the speed and direction of changes in wellbeing. For record and research purposes these proxies are measurable and expressible in pure mathematical form, and assist in the statistical testing of theories.

Increased interest in economic growth and development literature has led to a proliferation of empirical work and theories. Michael Todaro, (1997, p70) who interprets development as a "multidimensional process" summarises development literature into five competing categories. These are (a) the linear stages of growth model; (b) theories and patterns of structural change; (c) the international dependence revolution; (d) the neoclassical, free market counter-revolution; and (e) the endogenous theory of economic growth. Most theories concentrate on capital formation, a term used to describe increases in net investment in capital assets.

Kindleberger and Herrick (1977, pp 179-89) adopt a leaner classification for economic development theories. This comprises neoclassical, radical or Marxist, and structuralist categories. Adam and O'Connell (1997) identify three policy phases categorised as the "capital shortage" diagnosis (1970s), "policy failure" diagnosis (1980s), and the "institutional" failure of the 1990s.

21

1.2 Research Objectives

This thesis examines the nature and intensity of links between measures of financial sophistication and economic performance in Zimbabwe[b] for the period between 1924 and 1998. It relates economic performance to the propagation of financial intermediation over a period of seventy-five (75) years in order to identify any coevolution and / or long-term cumulative effects. Quantitative tests were conducted to evaluate the speed and direction of causal links between financial intermediation and economic performance. A vector autoregressive [VAR] approach is applied to fulfil the purpose of this investigation. To provide a philosophical background to the empirical analysis, the thesis explores the contradictory institutional developments in Zimbabwe over the years.

1.3 Importance of study

In this subsection I briefly outline the significance of this research. Conducting this analysis is important as it helps researchers to gain insight into the finance-growth nexus. Tests were executed to determine whether stylised empirical results are valid in a small developing economy. A range of alternative indicators is applied to gain the broadest perspective and to ensure an in-depth analysis. This approach is merited by the absence of a universally acceptable yardstick of financial sophistication. An appreciation of VAR time series techniques is an added bonus meant to inspire new comers to the concepts.

Very little scholarly work of this nature, if any, has been done in Zimbabwe using the latest time series techniques. In particular both policymakers and researchers have largely ignored financial intermediation. Apart from generalised newspaper articles, detailed research on financial institutions and markets is at best very sparse, and at worst outdated and wanting of depth. In my opinion there is much room for material improvement in LDC financial markets by virtue of their relatively low level of development. In addition most clients in

---

[b] The name Zimbabwe is used to cover the entire historical period under review. Before 1980 Zimbabwe was formerly known as Rhodesia. The name Rhodesia was given Imperial sanction in 1895 as a collective name for the then two provinces of Matebeleland and Mashonaland. Prior to that present day Zambia and Zimbabwe were referred to as Northern and southern Zambezia respectively since 1886. Zambezia was declared a British sphere of influence in 1888. The name Charterland was used briefly.

22

these markets are not financially sophisticated. They stand to benefit from enlightened policy decisions and market-led innovation. Rousseau and Wachtel (1998) concur that countries in early stages of development are the most likely to benefit from financial development. While production to some extent follows consumer tastes, Schumpeter ([1911] 1936, p65) is emphatic that innovative producers could "as a rule" educate customers "to want new things." If this assumption, like the concept of supply leading finance, is valid, financial sophistication could be instrumental in promoting economic prosperity.

This endeavour will assist in comparative studies because current cross-country studies give inadequate attention to small countries. Future scholars may learn from past documented experiences. Schumpeter (1936, p83) argues acquired knowledge is communally beneficial. Even an exceptional "giant of wisdom and will" cannot be materially and mentally self-sufficient.

1.4 Theoretical value

Empirical findings on the finance and development controversy are still contradictory; and the theoretical debate is unresolved. Applying new techniques to an alternative data set sheds new light onto the course of the debate. This study makes a worthwhile contribution to the finance and growth body of knowledge. Demirgüç-Kunt, and Levine (1999, p1) point out that unresolved debate "hampers the formulation of sound policy advice." I support this view because sound economic policies require accurate judgements about causality.

For academic and empirical purposes, this work hopes to stimulate and promote intellectual curiosity in time series analysis. To this end I present in detail, the VAR methodology in a pedagogic framework accessible to beginning researchers without specialist training in advanced mathematics. Existing formal works, though shining with elegant brevity and richness to an informed ear, feel esoteric and intimidating to would be converts not yet on the road to Damascus. Stock's (1994,p2745) comprehensive survey for instance, is addressed to "graduate students and applied econometricians." Is the mathematical rigor avoidable, one may wonder? However, in econometrics, running away from mathematical terminology and parsimonious "Greek" symbolism in favour of "learning for exams" under the guise of "appreciating the concepts" is not the

solution. See Spanos (1999, pp xvii – xviii.) According to Binmore (1992, p xxvi), as cited in Spanos on the same pages, inadequate depth is tantamount to

> an unwitting conspiracy between the teacher and the student to defraud whoever is paying the fees. The teacher pretends to teach, and the student pretends to learn, material that both know in their hearts is so emasculated that it cannot be properly understood in the form in which it is presented.

Many bivariate and trivariate VAR systems are misspecified in order to accommodate small data sets and the resultant fast exhaustion of degrees of freedom. Basing policy on flawed small scale VAR modelling systems can be disastrous. Indeed Watson (1994, p2901) asserts that it is "very important" for structural analysis to take into account all "important macroeconomic shocks" active in the economic process. This thesis uses a five variable VAR model; representing core economic sectors.

One or two entirely new contributions contained herein are minor result of this thesis that requires further investigation by other interested researchers. I propose a new measure of inefficiency that regards excess liquid assets as potential indicators of disintermediation, which variable is herein termed DRIFT. In this research I interpret the institutional landscape of Zimbabwe in an entirely new POIVAD framework. The new paradigm explores how value is created and distributed among economic agents in Zimbabwe. Despite the Soviet Union's technological advancement for instance, institutional constraints retarded prospects for financial sophistication and economic prosperity. On the finance-growth nexus, I urge financial researchers to make greater use of risk adjusted time series data being generated by prudential supervision. Historical cost based variables may inflate the depth of financial intermediation. On corporate governance I suggest that future research should conduct more fieldwork.

1.5 Empirical Importance

Charemza and Deadman (1992, p xi) suggest that cointegration and vector autoregressive [VAR] modelling are "relevant for time series rather than cross-section econometrics." I agree with this conclusion, hence my focus on a single developing country. Most researchers have concentrated on more devel-

oped countries or give a cursory examination to less developed countries (LDCs) in cross-country studies. The meagre depth of such studies means that individual LDC countries cannot draw detailed policy conclusions appropriate to their structures and circumstances. Demirgüç-Kunt, and Levine (1999, p1) note that existing comparative studies of the merits of market-based and bank-based financial systems have primarily focused on four countries namely the US, UK, Japan and Germany. In their considered view, similar per capita incomes and long run growth rates shared by these countries shroud the economic importance of financial aggregates. Beck, Demirgüç-Kunt, and Levine's (1999) online "New Database" (World Bank) allows financial analysts and researchers to undertake detailed examination of financial sector development and structure "across counties and over time along many different dimensions," (p3). Unfortunately, the newly constructed data set covers an inadequate span (1975 to 1996) and a few variables on Zimbabwe. The archaeology of financial data in Zimbabwe should yield a rich treasure as the Central Statistics Office dates back to 1928. Paucity of data continues to retard research and policy analysis in LDC. This thesis therefore complements and extends the World Bank data set. Empirical findings should assist authorities in selecting appropriate policy targets.

1.6 Structure of thesis

Briefly the thesis is organized into eight major parts. Section 1 proposes the purpose of the study and its significance. The major research questions are fully defined in section 1.7. Section 2 covers the literature review, summarising the stylised facts about financial intermediation theories and the relevant findings of leading researchers in that discipline. To put my research into its proper context, background details of the Zimbabwean economic system are presented in Section 3. A new theoretical or philosophical framework, Poivad, developed herein attempts to resolve the inconsistencies and contradictory developments perversive in the Zimbabwean society. This is followed by a consideration of the evolution of the Zimbabwe financial system in Section 4. Section 4 also gives a very brief account of the structure of the Zimbabwe financial system. Chimombe (1983) and Mataruka (1999) provide full accounts on the financial structure.

25

These sources are at best general guides as the financial landscape continually changes with time. Section 5 discuses variables included in the study and data transformations. Details of the applied methodology comprise Section 6, which discusses the VAR method, its applications and criticisms. The characterisation of the functional form of the equations initiated in Section 6 extends to cointegrated VARs in Section 7. In Section 8 the results of the tests, their interpretation and evaluation are presented. After highlighting the main findings of this project, the last part of the thesis suggests directions for further research.

1.7 Problem Statement

But research questions are not written in stone. They, like the researcher asking them, evolve as the research proceeds.

Johnson, Johnson and Buse (1987, p394)

This thesis is a study of financial intermediation and economic performance. It discusses and evaluates the significance of financial intermediation on real activity. The structural impediments to efficient intermediation and consequently economic development are explored using both narrative and quantitative frameworks. The three major research questions considered in the course of this study are briefly outlined below.

Question 1: What relationship, if any, exists between financial intermediation and economic performance?

Discussion: This question looks at the economic significance of financial intermediaries. Finance theory has not has not yet resolved the issue. Classical theories ascribe no role to financial intermediaries because they owe their existence to market imperfections. Current literature suggests that banks do not just offer special services such as providing liquidity and risk management as economic agents, but could be entrepreneurs in their own right. Statistically the magnitude of parameters can shed light on whether financial intermediaries have a positive, negative or neutral effect on economic performance.

Question 2: Do financial aggregates relating to size, activity and the degree of financial sophistication contain useful information about movements in economic activity?

Discussion: Proponents of financial intermediation have almost reached a consensus that intermediaries have a positive effect on real activity. They, however, differ on the actual mechanics operating the finance and growth interaction. This thesis uses a broad array of recently developed indicators to test the direction of causality and the persistence of shocks over time.

Question 3: How relevant are institutional factors (such as governance, regulation, and societal relations) to the process of economic development in Zimbabwe?

Discussion: Economic development in the Third World has been very problematic. Adam and O'Connell (1997) note that poor economic performance was initially blamed on "capital shortage", a phase that lasted throughout the 1970s. When foreign aid and external debt failed to stimulate sustainable growth the "policy failure" diagnosis (1980s) emerged. The "institutional" failure diagnosis of the 1990s came as a result of bleak economic activity in spite of widespread liberalisation and economic structural adjustment programs. The emphasis is now on good governance, accountability, transparency and contract enforcement. As Delhaise (1998) put it, the collapse of the Asian financial system was not a surprising due to fundamental weakness. According to him, what were surprising were the panics and not the crisis. Levine (1998), La Porta et al (2000) and Zingales (2000) ably incorporate these issues into the theory of financial intermediation / finance. I provide a Zimbabwean overview knowing that Schumpeter (1954, p12) hails history, statistics and "theory" as the three pillars of economic analysis.

2. LITERATURE REVIEW

The return to new knowledge is higher, the more you already know.

Easterly W and Levine R (2000, p20)

2.1 Intellectual Origins of Financial Intermediation

Money may be the oil of commerce, but intermediaries are its engine.

Spulber (1999, p344)

Financial intermediation literature revolves around three competing hypotheses. Proponents of financial intermediation propose a positive causal effect on the financial and real sector interaction. Classical theory posits that the real sector (income) leads money, and the financial sector with the exception of money supply, is neutral. The third view regards the rapid development of the financial system as detrimental to economic prosperity.

Conceptually, the role of sundry financial variables on aggregate economic activity has always been controversial. Alexander Hamilton (1871) cited in Beck, Levine and Loayza (2000, p32) argued that "banks were the happiest engines that ever were invented" for creating economic growth. Bagehot (1873) as reflected in Becsi and Wang (1997, p50) attributed the rapid 19th century industrialisation of England to sophisticated financial intermediation. On the other hand Levine et al (2000) note that US President John Adams (1819) considered banks to be harmful to the "morality, tranquillity and even wealth" of nations. This view supported Ricardo's conception as cited in Schumpeter (1936, p98) "that 'banking operations' cannot increase a country's wealth." Ajit Singh (1997) attacks financial sophistication as a luxury developing countries can ill afford. In his view, financial liberalisation, especially the rapid expansion of stock markets brings about increased financial fragility that is detrimental to economic performance and development. Over the years financial institutions have been subjected to mechanical limits on liquidity, solvency and credit creation. A high degree of liquidity, high ratio of indebtedness, high concentration of financial assets as opposed to real assets, and close regulation distinguish financial in-

28

stitutions, Lewis (1995, pxiii). The Glass-Steagall Act (1933) and "Regulation Q" institutionalised the distrust of banks in the US. In fact the regent US Financial Modernization Act acknowledged that financial intermediation is susceptible to government intervention and distortion at both a micro and macro level.

At a macro level, Mark Gertler (1988) and Mattesini (1993) concur on the fact that theory and research on the linkages between financial and real sectors have been directed at (i) the relationship between financial development and economic growth; (ii) financial factors in corporate investment; and (iii) financial crises and business cycles. On a micro level, transaction costs, market organization and microstructure provide a valuable exposition to the understanding of financial intermediation. A new focus on information asymmetry, liquidity insurance, deposit contracts, delegated monitoring has enriched the theory of financial intermediation. Baltensperger (1980), Gertler (1988), Bhattacharya and Thakor (1992) and Thakor (1996) provide comprehensive reviews of the literature. Rapid advances in the field have taken their toll on Baltensperger. However, the emphasis on complete endogenous models remains a potent challenge. Gertler remains a valuable and very accessible review of developments before 1988. Thakor's important synthesis brings out crucial advances in the literature with a particular emphasis on financial design.

(a) Early developments to modelling financial intermediation

Early studies in financial intermediation focused on credit expansion and creation of money by banks. The existence of financial intermediaries was assumed. Edgeworth (1888), who regards probability as the "foundation of banking", formally demonstrated that banks could generate economies of scale as long as withdrawals remain stochastic events and the behaviour of depositors independent of each other. A fractional reserve banking system translates into a money multiplier process. Outside the realms of money and credit creation, finance and economics theory regarded investment as the real engine behind economic activity and the monetary system was reduced to a neutral process. Monetary neutrality refers to the irrelevance of money in aggregate economic analysis as portrayed in classical economics. Classical dichotomy is the separation of macroeconomics into real and nominal (monetary) variables.

Joseph Schumpeter ([1911] 1936) is credited with drawing closer attention to the importance of financial intermediation's influence on innovation and economic growth. His seminal work merits a closer examination because he considered the popular Keynesian role of savings and investment in "the traditional doctrine" of capital formation to overlook "essential factors", (p68) and in some cases amounting to "faulty analysis" (p71). As a result I review his work at considerable length. This is important because available financial intermediation literature reviews by Baltensperger (1980), Gertler (1988), and Thakor (1996) all do not discuss his work. Alternative references such as Levine et al (2000) do not show how his work was linked with financial intermediation.

The chief cornerstones of Schumpeter's analysis are grounded on the trinity of entrepreneurial talent, destructive innovation [or progressive differentiation], and credit funding. Innovation is the hallmark of entrepreneurial talent and economic development. Development is change. Schumpeter (1936,p67) believed that new firms are more innovative than old ones. In a competitive environment the predictable economic consequence is "the competitive elimination of the old" by drawing productive resources away from them. An important insight in Schumpeter's work is his appreciation that disposable property gives producers command over means of production. While, with hindsight, this appears to be a self-evident privilege, the insight enabled Schumpeter to emphasise the importance of credit ahead of savings. If innovators are putting together entirely new processes, and have no previous production or disposable assets to draw on, it becomes imperative that they rely on credit, fait accompli, if production is to continue. Even wealthy firms have to resort to credit if their savings are employed elsewhere and are not available for the new project. Credit also liberates individuals from reliance on inheritance and the extent of one's fortune.

I cannot put more weight on the importance of credit than Schumpeter's (1936, p70) own words when he declared "that talent in economic life 'rides to success on its debts'..." Credit enables innovative entrepreneurs to have access to existing productive resources. In market economies industrialisation cannot exist without credit (p 70). According to Schumpeter (1936, p108-9), credit granted to finance entrepreneurial activities results in an increase in real output while credit expansion to finance consumption leads to inflation.

The relationship between credit and capital is controversial. Schumpeter ([1911] 1936, p98) acknowledges J. L. Laughlin's observation that "Credit does not increase capital (that is, means of production) but mobilises it and makes it more efficient and thereby leads to an increase in product (sic)." Mises ([1912] 1934, p22)[c] reiterates that the conclusion that expansion of credit cannot form a substitute for capital cannot be disputed. Credit (or money) matters and financial intermediaries facilitate and expedite the exchange process. According to Mises (p35) the relevant exchange is that of "facilitating credit transactions ... [which is] nothing but the exchange of present goods against future goods." Financial intermediaries, such as banks, create and mobilize financial "assets" from many depositors or savers and the conduct of separate and independent contractual transactions with borrowers. In Gurley and Shaw's (1956) terminology financial intermediaries go between economic units with surplus financial assets and borrowers in need of financial resources for investment and other transactions (deficit units). Schumpeter, however, suggests banks do more than providing a link between depositors and producers. Bank contracts in competitive markets approve the nature of new real activity that can be undertaken with intermediary support. In a capitalist environment, Schumpeter (1936, p74) is unapologetic that the banking system, being "the ephor[d] of the exchange economy" "authorises people, in the name of society as it were, to" innovate. Theoretically, only the entrepreneur needs credit for innovation and economic development. Granting credit in this sense "operates as an order on the economic system" to provide the entrepreneur with productive resources" p106.

Recent advances in financial literature focusing on the links between credit and corporate governance give Schumpeter little credit than he actually deserves. The basic idea is that financial intermediaries can influence corporate governance practices within firms via precontract screening and extending monitored credit. As early as 1911, Schumpeter controversially argued that the entrepreneur does not bear risk given his reliance on credit[e]. Therefore financial intermediaries relate limits to credit extended to the borrower's productive ca-

[c] Although I have not yet read Mises' book "The Theory of Money and Credit", (which was not available to me) I am grateful to one of my anonymous examiners for bringing this point to my attention.
[d] The Cassell Dictionary (1994) defines an ephor as "one of the five magistrates chosen at Sparta and invested with the highest power, controlling even the kings."
[e] This is se'f evident if the entrepreneur is totally dependent on credit. In practice financial intermediaries insist on owner contribution to increase commitment to the project and reduce ex-post effort aversion.

pacity. The granting of credit beyond entrepreneur's ability to produce commodities results in losses to financial intermediaries, Schumpeter (1936, p114). In order to avoid "making bad commitments" banks devise rules to manage individual cases. This foreshadows concepts of monitoring, screening, adverse selection and moral hazard problems later pursued by Arrow (1974), Diamond (1984), Diamond and Dybvig (1986) and Stiglitz and Weiss (1990).

Although entrepreneurship affects class position, social history, style and values of life, Schumpeter (1936, p78) warns that it is neither a profession nor a lasting condition. This adds more weight to the need for monitoring and information gathering services provided by financial institutions in general and banks in particular. In addition to entrepreneurship not being a profession, economic talent is however scarce because innovators employ "unused productive capacity." As Schumpeter puts it, "This mental freedom [to innovate] presupposes a great surplus force over the everyday demand and is something peculiar and by nature rare", (p86). This is an important point because good economic leadership is not necessarily endowed with every talent. Good leadership should cultivate an economically conducive environment and permit all good stars to shine. Every constructive talent works for the good of all. Entrepreneurial talent thrives on competitive innovation. In turn, competitive innovation promotes prosperity.

Despite these early leads, financial variables remained on the periphery of formal economic models. Since Adam Smith [1776] economic theory considered money and financial structure to be a function of the needs of the real sector (or trade). The classical model assumes capital markets to be perfect and frictionless. Money is rendered neutral, hence has no effect on capital accumulation other than being a transaction driven medium of exchange. Other financial assets are regarded as mere claims on physical assets. As late as 1989 the World Bank (p26) was still regarding the provision of a medium of exchange as the financial system's biggest contribution to growth. The irrelevance of money in neoclassical real activity is termed monetary neutrality. Classical macroeconomic theory distinguishes between real variables and nominal variables. And the resultant separation is termed classical dichotomy. Relative prices are determined in the real sector while the general price level arises in

the monetary (nominal) sector. Therefore changes in money supply cause a rise in the relative price level but no effect on the real variables.

Taylor (2000, pp xiv and 207) regards the failure to recognise importance of money as the major failure of classical theory. Stiglitz (1993) cited in Spulber (1999, p5) argues that the Arrow-Debreu framework is tantamount to "engineering economics" preoccupied with solving maximization problems. Clarke (1986, p14) argues that money is an "important motor" for economic development:

> Money, apart from being a financial asset itself, has historically been the most tangible measure and expression of financial activity, both at the 'micro' (firm) and, more relevantly, at the 'macro' (national) level.

Joseph Schumpeter's work is also subject to controversial interpretation. Podolski (1986, Chapter 7) notes that there is a general tendency to over read Schumpeter's work. In Podolski' (1986 p181-3) view Schumpeter's work does not portray financial innovation as the principal determinant of economic evolution because in other works Schumpeter reiterated the primacy of real development "with money and finance playing an adaptive, but not, a secondary role." In this framework technological innovation spearheads real development "with social, financial and managerial invocation being a necessary by product of technological change," Podolski (1986, p182) reiterates. In my opinion, the real and financial sectors must be given equal weight because the current state of knowledge suggests that financial innovation and sophistication augments productivity in the real sector. For instance, credit creation finances the process of technological change. When credit creation is not in proportion to technological change, inflationary booms arise to the detriment of real output.

I agree with the verdict of Baltensperger (1980, p1) that financial intermediation literature "is still unsettled and rather heterogenous" because there are numerous different approaches and techniques. However, while Baltensperger suggests that existence of rival models (a) "reflects the difficult nature of the topic"; (b) a "wide range of phenomena analysed (Mattesini, p 131)"; and (c) the diverse objectives pursued by researchers, I believe that a greater part of the problem lies in terminological inconsistence and cognitive heterogeneity. The economic distinction between money and credit in financial literature is

blurred. Some researchers refer to monetary aggregates as indicators of the financial system while others have credit aggregates in mind. See Appendix 1 for details. Confusion about concepts can destroy the value of research.

(b) The Keynesian revolution

Before the Keynesian revolution, however, the business cycle theory was influenced by financial factors. The loanable funds theory of interest rates, for example, attributed business cycles to expansion or contraction of credit. Hawtrey (1919, 1928), Wicksell (1935) and Hayek (1931) all cited in both Gertler (1988, p562) and Mattesini (1993, pp 7-8) emphasized the tendency of banks to "over extend" and "over contract" credit due to imperfections in the credit and financial markets. The market anomalies and the tendency toward over-learning (overreacting) cause fluctuations in economic activity.

Irving Fisher (1933), writing in the inaugural issue of Econometrica, attributed the severity of the Great Depression to poor performance of financial markets. He outlined the theory of debt deflation - a phenomenon under which small shocks produce severe cumulative effects on highly leveraged borrowers. Real output also suffers greatly from distressed attempts to expunge indebtedness. Gertler traces Fisher's concept of debt - deflation to the works of both Veblen (1904) and Hawtrey (1926).

Subsequent to the general acceptance of Keynes's liquidity preference theory in place of the loanable funds theory, money supply replaced credit and other financial aggregates as determinants of aggregate economic activity. In Keynesian analysis financial structure is not very important because output is determined by investment behaviour, which in turn depends on 'animal spirits and spontaneous optimism'. The general political and social atmosphere will naturally influence investors' confidence in a particular economy. As Gertler (1988, p562), put it the "state of confidence" is depended on (a) the borrowers' views on projects' expected returns and (b) the extent of lenders' confidence in borrowers' "state of credit." According to Gertler, a collapse in the confidence of either lenders or borrowers could precipitate a downturn in economic activity. Recovery is dependent on restoration of confidence in both sections. Mattesini, closely led by Gertler, concludes that the Keynesian framework and subsequent

analysis by Hicks (1937) and Modigiliani (1944) put emphasise on the demand and supply of money.

After the Keynesian revolution macroeconomic theory only considered financial intermediaries to the extent they affected the stock of money. Indeed monetary neutrality prevailed for over 50 years. In a neoclassical framework, Tobin (1958) regarded the demand for money as a demand for an asset that is represented by a demand for other financial assets. Tobin (1965) and Johnson (1967) proposed a substitutability hypothesis, which considered money a substitute of physical assets. According to Tobin (1965) a high interest rate return on a monetary asset would result in a portfolio shift in favour of financial assets and reduced capital accumulation. Modigiliani and Miller (MM) (1958 and 1961) formally proposed that financial structure and dividend policy are irrelevant to real economic decisions, if the market is perfect in an Arrow-Debreu sense. Therefore financial intermediaries were regarded as redundant. Following MM's work, macroeconomic models, for example Fama (1980), did not consider financial factors. Financial structure is irrelevant in the classical models because economic performance determines financial scope. Kutznets (1966) concept of modern economic growth, for instance, focused on structural change, physical and human aspects, but did not consider the role of financial intermediaries in economic growth.

The primacy of savings and investment is not immune from attack. In an imaginary world of universally balanced budgets, Gurley and Shaw (1955 p259) note financial intermediaries are not likely to survive because each economic unit's level of investment equals its own current savings. The simple Keynesian income identity without government and external sectors determines output at a level where investment equals savings. Schumpeter, however, strongly dismissed the significance of savings and monetary policy in economic development. Schumpeter (1936, p96) argues that there is no idle stock in the circular flow of income, and concludes that real activity cannot rely on savings without disturbing the relative purchasing power of individuals, but does not fully explain the origins of credit. Robertson (1926) cited in Taylor (2000, p108) suggests that savings precede investment. Robertson allows categorisation of voluntary savings, and involuntary (forced) savings. Forced savings refers to the excess of investment over voluntary savings. In Keynes's "General Theory" on the

other hand, investment always equals current savings but the source of the initial capital stock is not clearly spelt out. On the contrary Pagano (1993) concluded that financial development increases savings allocated to investment as well as the social productivity of capital. Financial development becomes a precondition for economic development. Notwithstanding the analytical weight the Keynesian paradigm put on investment, the current thinking (see Easterly and Levine [2000] and Pritchett [2000]) suggests investment accumulation is neither capital nor a significant determinant or economic growth. I will come back to this point in subsection 3.2.

The Keynesian emphasis on money supply instead of the whole financial system received support in the unlikely quarter of monetary economics. Banks were the only important segment of the financial system and only to the extent their liabilities affected money supply. Government intervention is permissible in monetarist and Keynesian models. Monetarists emphasise the use of rules while Keynesians vouch for discretion. In tandem with Hicks' (1937) ISLM macroeconomic models, Friedman and Schwartz's (1963b) analysis considered banks irrelevant as long as the central bank can influence real activity via control of money supply. Friedman and Schwartz's (1963a, 1963b) monetary study of the United States popularised money supply as the key financial aggregate. Their study found a positive correlation between money supply and output. They suggested that turning points in the money stock preceded turning points in nominal income. According to their evaluation the stock of money predicts output and business cycles better than investment or "autonomous expenditure." This led to a series of studies testing the hypothesis that money leads income. Modern sophisticated econometric approaches now permit researchers to test the alternative hypothesis that income leads money.

Difficulties in modelling market imperfections and the behaviour of heterogeneous economic agents did not help the case for financial variables. According to Gertler (1988, p565) it was very difficult to incorporate other financial variables in macroeconomic models because there was no rigorous analysis matching the MM elegance to justify their inclusion. Methodological approaches then existing were not theoretically equal to the challenge to jointly determine an endogenous financial system with real output. Good forecasting ability of bi-

variate VAR models of money and output strengthened the evidence for the hypothesis that money has a strong causal role on output.

(c) Financial system renaissance and the counter movements

Gurley and Shaw (1955 and 1960) and Tobin (1963) revived the study of financial intermediaries and the overall financial system. Their research de-emphasised the "uniqueness" of banks by highlighting the intense competition faced by banks at the hands of the non-bank financial institutions. According to Gurley and Shaw's "new view", portfolio substitution and the role of economies of scale become important as the financial system grows in sophistication. In an advanced financial system, money supply is not the only relevant financial aggregate. In such an economy money supply is also a poor proxy for the level of financial intermediation. Lynch (1993) notes China has a money supply to GDP ratio equal to that of Japan and higher than Australia's but not equally sophisticated. Gurley and Shaw suggest financial sophistication is good for growth. McKinnon (1973), Shaw (1973), and Fry (1981) advanced the complementary hypotheses. Baltensperger (1980, p2) finds the disregard of the financial sector in classical paradigms surprising given the magnitude of real resources such as labour and capital committed to the financial sector.

Mattesini (1993, p1) attributes this renewed interest in financial structure to advances in information asymmetry theories and empirical evidence demonstrating the explanatory power of alternative financial aggregates. Generally credit and equity market imperfections are sometimes attributed to informational asymmetries. The emergence of new representation techniques such as the General Method of Moments (GMM), Impulse Response Function (IRF) analysis, forecast error variance decomposition (VDC) and vector autoregression, (VAR) brought with them empirical flexibility, which lead to the re-examination of financial factors. Availability of these and other new econometrics techniques facilitated the formal characterisation of the financial system as an important determinant of aggregate economic activity, productivity and economic development.

Time series studies by Sims (1980, 1988) challenged the primacy of money as a determinant of output. Traditional inferences about causality were

considered 'incredible'. Mishkin (1978) found the collapse in households' financial net worth during the Great Depression was detrimental to aggregate demand. Bernanke (1983) supports this finding and concludes that the collapse of the financial system, not just money supply, worsened the shrinkage in economic activity. The acceptance of endogenous growth theories popularised by Lucas (1988) and others has resulted in revival of interest in the determinants of economic growth. In Farmer's (1984) model [yes, Farmer not Fama], financial markets are imperfect due to asymmetrical information, and incomplete as a result of overlapping generations. The model demonstrates that both current stocks and the history of previous innovations affect real variables. In Greenwood and Javonic (1990) intermediation arises endogenously.

Patrick (1966) cited in Jayaraman (1996, p8) argued that the direction of causality changes over time. Two patterns of causality were suggested namely demand following and supply leading. The demand following view postulates that economic activity determines the demand for financial services. On the other hand the supply-side approach suggests that development of financial services precede demand for the services. Jung (1986) investigated the direction of causality between financial development and economic growth in 56 countries. The study found that developing countries were generally associated with a "supply-leading" causality. This indicates that causality runs from financial to real sector development. The result discredited Tobin's (1965) and Johnson's (1967) substitutability hypothesis, which considered money a substitute of physical assets. "Real assets do not bring the benefits of financial assets because they cannot be loaned to investors," Sudweeks (1989, p102) stresses.

Financial economists have built considerable consensus on the importance of the finance and real sector interaction. However the actual mechanics through which finance affects real activity is still debatable. Freixas and Rochet (1998, p161), among others, emphasize two monetary transmission mechanisms namely the money and credit views.

(i) The money view

The money view, represented by the ISLM model, only emphasizes the bank's liabilities, the main constituent of money supply. Short-term interest rates are determined by the interaction of demand and supply for money. Loans and

bonds are considered to be perfect substitutes for borrowers. The central bank has control over monetary policy but prices do not adjust instantaneously to offset changes in the quantity of money. Short-term changes result in real effects. In the long term adjustment is possible.

(ii) The credit view

The credit view emphasises the asset side of the banks' balance sheet. Close substitutes to credit are ruled out for households and small firms. Fama (1985), in contrast to Fama (1980), observed that some categories of borrowers could not perfectly substitute open market credit for bank credit. As a result bank credit is special to them. In addition information gathered by banks on borrowers confers to them comparative advantages.

Modern studies emphasize reputation in deciding sources of credit. Figure 1 below shows a spectrum of firms, blessed with different capital endowments, and their respective sources of funding.
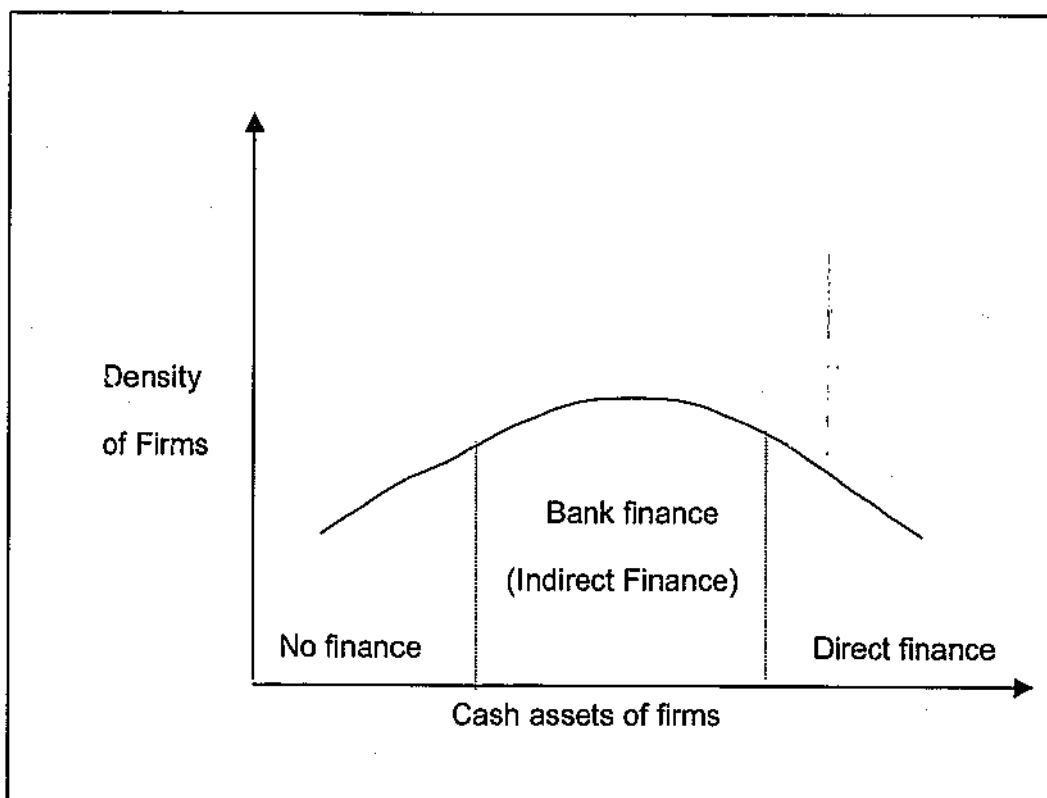
[Source: Freixas and Rochet (1997, p185]

39

Figure 1   Categories of sources of finance among firms

In Diamond (1991) young firms and those with tainted reputation borrow from banks. Firms with high reputation investments need no monitoring; hence they use capital markets. Holmström and Tirole (1994, 1997) suggest small firms, virtually without capital (collateral) acceptable to the market receive no external funding. Bank credit is out of reach because they cannot afford the cost of monitoring. Medium firms obtain credit from the bank while large entities finance their requirements from the market. Monetary policy can have real effects by altering availability of credit. Therefore financial intermediation affects real activity. Zimbabwe, for instance, has many small and medium size firms that might benefit immensely from bank finance. Monitoring uses resources. Intermediaries must be financially sound and adequately capitalised. The need for financial intermediaries to invest in the building of their own capacity entails that not every firm in the economy can be monitored.

The Structuralist Hypothesis, also known as the Gerschenkron Hypothesis[f] had previously arrived at similar conclusions. Gerschenkron (1962), according to Chimombe (1983, p42) and Miwa and Ramseyer (2000), suggested that appropriate sources of finance depend on "the relative degree of economic backwardness" and financial innovation within the economy. In essence Gerschenkron argued that industrialised countries such as England could rely on financial markets for their requirements. Intermediate backward nations, then represented by Germany had to rely on banks. Japan was also included as a bank-centred model. Economies still at the extreme stages of economic backwardness, then epitomised by Russia, should depend on "the visible hand of the czar", that is, government. Gerschenkron, by Chimombe's (1983, p42) account observed that

> The scarcity of capital in Russia was such that no banking system could conceivably succeed in attracting sufficient funds to finance a large scale industrialisation, the standards of honesty in business were so disastrously low, the general distrust of the public so great, that no bank could ... successfully engage in long term credit policies in an economy where fraudulent bankruptcy had been almost elevated to the rank of a general business practice.

---

[f] See Chimombe (1983, p41) though under a different spelling.

Miwa and Ramseyer (2000, p5) note that a vast body of financial intermediation literature such as superior monitoring, screening capabilities, agency theory, information asymmetries, adverse selection, moral hazard, and credit rationing could "potentially" be traced to Gerschenkron's role of banks.

Since the classic study by Gerschenkron (1962) there has been a series of debates on the comparative merits of the "Anglo-Saxon" **market-based** and the "Continental" **bank-based views** of the financial system. Demirgüç-Kunt and Levine (1999) find the distinction between banks based and market based financial systems has run out of steam. There is a tendency for both to increase as the economy gets sophisticated. Levine (2000) provides strong support to Merton's (1991) **financial services view** that regards banks and markets as complementary vehicles for financial services. Building on this, La Porta, Lopez-de-Silanes, Shleifer, and Vishny [LLSV for short] (1997, 1998, 1999, 2000) reject the bank-based versus market-based debate. They propose a **"legal-based view"** which emphasises structural and regulatory factors influencing financial structure and performance. La Porta et al (1999, p24) view finance as a set of contracts: "In the end, the rights create finance." A competent legal environment is required to enable financial markets and institutions to fulfil their roles. LLSV's evidence supports the need for rule of law and efficient enforcement of contracts. Levine (2000, p5-6) concludes that,

> There is no cross-country empirical support for either the market-based or bank-based views. Neither bank-based nor market-based financial systems are particularly effective at promoting growth. ... Thus, cross-country comparisons do not suggest that distinguishing between bank-based and market based is analytically useful for understanding the process of economic growth.

(d) Optimal financial structure

Baltensperger (1980, p3) argues that most theories of financial intermediation are "partial" models that concentrate on portfolio aspects. This is rightly so since early models of banking either focused on liability management, asset management, or asset and liability management concepts. The banking challenge was to balance the conflicting demands of profitability and solvency. In partial models the size and structure of the banking system are "assumed to be

exogenously determined." As a result partial models are preoccupied with allocative and operational efficiency. Gertler (1988, p582) argues that disaggregated results from partial models generate ambiguous policy implications. This makes it difficult to evaluate monetary policy.

"Complete" theories of banking, as envisaged by Baltensperger should "explain the joint determination" of structure, size and portfolio:

> A complete theory of the banking firm, however, should not only provide an integrated view of the firm's assets and liability choice, but also allow an endogenous determination of the total scale of operation of the firm (p 3).

Baltensperger reviews Klein's (1971) monopoly model but disagrees with its strong reliance on the assumption of monopoly power. Other models of optimal banking are based on risk aversion and they followed Markowitz's general portfolio theory. In Pyle's model (1971) [see Baltensperger pp 24-29], financial intermediation exists when there is a positive difference between the expected return on assets (loans) and liabilities (deposits). Arbitrage is limited by varying degrees of risk aversion among economic units. The model fails to account for input costs, solvency, liquidity and the endogenous origins of financial intermediaries.

> Why will the bank find customers willing to hold a financial asset ('deposits') at an expected rate below the one which the bank can obtain itself, and others ... willing to indebt themselves to the bank at an expected rate [higher than] the bank has to pay itself?

Santomero and Seater (1998) adopt the Holmström and Tirole (1997) framework to formally derive an optimal structure of banking. The optimal structure is not dependent on size or state of the economy but on the proportion of capital allocated to banking sector, degree of inefficient behaviour in the financial system, and the impact of monitoring [financial intermediation] on output. Monitoring increases the productivity of middle firms, and affects the growth rate of the economy as well as output. It is my hope that researchers will soon confront this model with data to evaluate its empirical validity.

With direct reference to Zimbabwe the quest for an optimal banking structure has caused needless disquiet in the financial circles. There has been wide speculation on whether Zimbabwe has an overbanked financial system. In

42

my view the conclusion that the Zimbabwe financial market is overbanked is based on crude estimates. Mataruka (1999, p66-7), for instance used the Herfindahl Index, normally applied to analyse monopoly power (market dominance), to suggest that the "overgrazed" market had room for 5 commercial banks instead of 8 then in the market. There is a high risk of confusing concentration with optimality. Humphrey (1990) demonstrates that "the size of scale economies of banking" is affected by a number of economic and political issues as well as systematic biases. Different researchers, applying different cost definitions and output measurements could arrive at conflicting policy conclusions. Recent cross-country studies and panel data (See Demirgüç-Kunt and Levine 1999 or Table 1 above) actually suggest Zimbabwe has an underdeveloped financial system. Attempts to demarcate an optimal banking structure by legislation or licence could create opportunities for rent seeking and inefficiency.

2.2 Empirical Evidence: Does Financial Development Promote Growth?

Freixas and Rochet (1997, p 176) note that classical theories fail to explain why macroeconomic variables (output, investment, employment) fluctuate, more than the fundamentals (productivity and demand parameters). Financial intermediation scholars attribute the residual cyclical fluctuations in macroeconomic variables to financial factors. Policymakers and applied economists also believe fluctuations in financial variables have a real effect both in the short run (stabilization) and in the long run (growth) to the extent of warranting close attention. In extreme cases financial markets are regulated "*to the point of financial repression,*" Denizer, Desai and Gueorguiev (1998, p2). [Emphasis original.] Unfortunately financial repression is usually detrimental to economic growth.

Empirical evidence in favour of financial factors has been overwhelming although no consensus has yet emerged. Gurley and Shaw (1955, 1960) were the first to stress the importance of the financial structure or "financial deepening view" in economic growth. Their work promoted the establishment of a wide network of financial institutions. They argued that banks and other non-bank financial institutions (NBFI) exist to transform financial contracts and securities. These institutions facilitate the circulation of financial resources between savers

and businesses. Benston and Smith (1976) and Fama (1980) extended this view. Financial intermediation is critical as it affects inter-temporal trade and general economic activity. In Body and Prescott (1986) financial intermediaries foster economic growth by enabling improved screening of projects.

Goldsmith (1969) made a rigorous cross-section study to establish the causal links. A positive correlation was found between economic growth and the intensity of financial sector development. Mishkin (1978) found that aggregate demand during the Great Depression was significantly affected by consumers' net financial position. An important study by Bernanke (1983) concluded that money supply alone could not account for the Great Depression. The depth and persistence of the depression can be attributed to the collapse of the financial system. In particular, liabilities of failed banks and interest differentials on good and bad bonds had significant explanatory power.

By the 1970s, seminal works of McKinnon (1973) and Shaw (1973) established that financial repression retards economic growth. In the wake of poor results from foreign aid, two views about financial development were proposed. McKinnon's (1973) Financial Repression Hypothesis promoted widespread financial liberalisation in the 1980s as a precursor for economic development. Shaw (1973) popularised "financial deepening" denoted by the accumulation of financial assets, as a significant determinant of economic prosperity. Shaw traces poverty, unemployment and overvalued exchange rates to "shallow" finance and financial repression.

Denizer, Desai and Gueorguiev (1998, p3) define financial repression as

> [A] set of policies, laws, formal regulations, and informal controls, imposed by governments on the financial sector, that distort financial prices – interest rates and foreign exchange rates – and inhibit the operation of financial intermediaries at their full potential.

The reasons for and against financial repression are well known. See either McKinnon or Shaw for example. I have picked only "economic myopia" and seigniorage for closer scrutiny because they have a direct bearing on financial intermediation. McKinnon (1973, p22) suggests that authorities who suffer from "the Intervention Syndrome" promote financial repression as "second best optimisation." The typical arsenals of financial repression commonly deployed in

44

the financial market are exorbitant reserve requirements and artificial interest rates. Economic myopia, as depicted by Shaw (1973, p15), arise in an economy where there is no due regard for the consequences of partisan decisions made in favour of one section of the community. Apart from welfare concerns there is strong evidence that governments perpetuate financial repression either as a source of power and revenue. Ironically both the tame and wild characteristics of financial instruments make them a ready cash cow for fiscal imprudence. At the wild end, "Capital is so fungible, so slippery for regulation to cope with, that there is a strong tendency to multiply restrictions," Shaw (1973, p92). On the tame side, taxation of financial assets is usually more severe and effective than say taxation of real property and informal trade. The so-called "easy money" thesis views financial repression as a deliberate policy choice to transfer financial assets to the fiscus. According to Hayek (1976, p27)[9] governments engineer inflation for their own benefit. "As if the inflation tax were not enough", argues Shaw (1973, p90),

> [Other] taxes discriminate against income from financial assets. Suck income is conspicuous, unless it flows through the street market, and easily reached by the tax collector.

The government, especially in economies where it grapples with low tax yield, costly public debt, and perennial fiscal deficits easily succumbs to the temptation to debase the currency in order to gain seigniorage revenue. In simple words seigniorage is the profit (purchasing power) raised by the government from printing money at a rate above its intrinsic value. Schuler's (1992) dissertation highlights that notes and coin do not pay interest unlike other securities; hence the issuer acquires purchasing power without sacrificing reserves or other resources. The Federal Reserve Bank of Cleveland [FRB Clev.] (1995 p9)[1] traces the terminology to the "seigneur's" (French for feudal lord) "exclusive right to coin money on his manor" in the Middle Ages, which prerogative now vested in government. The risk of governments to "eventually abuse their powers" (FRB Clev.) is so real that some countries erect legislative barriers and grant cental banks independence from monetary authorities.

---

[9] See *The Federal Reserve Bank of Cleveland (1995)* "Governments and Money" essay.

45

The McKinnon - Shaw studies left a legacy of closer attention to financial liberalization. They argued that liberalisation would provide the market with a wide portfolio choice. High real interest rates were regarded as favourable to savings, investment and economic growth. In the Zimbabwean context Chimombe (1983, pp 39-40) reluctantly blames financial repression for "inefficient credit allocation" and bias against green projects of all types.

Subsequent financial instability at the heels of liberalisation convinced many that the hypothesis was incomplete. Denizer, Desai and Gueorguiev (1998, p5) argue that the "easy cash" thesis of financial repression is incomplete because policymakers facing the same budget constraints react differently and not axiomatically. Denizer et al observe that directed credit is an exogenous cause of financial repression rather than an endogenous outcome of repression as hypothesized by the easy cash view. Their evidence gleaned from former Soviet transitional economies attributes financial repression to centralisation of political power and internal opposition to reforms within the government. Neither Shaw nor McKinnon drew attention to banking institutions' insolvency or the need for prudential supervision, observe Cole and Slade (1996, p7). Subsequent bank failures in all parts of the world convinced many that financial liberalization without structural stability is a recipe for inevitable financial collapse. Fry (1988) was convinced that regulation and prudential supervision were the areas in need of critical research.

Fisher's debt-deflation theory was reinvigorated by Minsky (1972) [2] who proposed the Financial Instability Hypothesis. In Minsky's world, financial systems are pathologically unstable. Financial crises become systemic and endogenously generated events rather than accidents. If the economy is doing well, for instance, banks may over lend and the borrowers over borrow. When circumstances change both parties may fail to adjust resulting in bank failures.

Kindleberger ([1978], 1996) like Minsky argues that money and credit have never been properly managed throughout history. Society has a tendency to over learn resulting in a series of manias, panics and crushes. Fischer, Gueyie and Ortiz (1997), using a GMM statistical procedure, conducted event studies to determine whether financial liberalisation increases risk on banks' exposures. Their evidence suggests that financial liberalisation increases bank

risk. Fischer et al stress that while bank exposures are sensitive to both macroeconomic and management factors, management variables could be more critical. Ajit Singh (1997) suggests that rapid expansion of the financial system, especially stock exchanges, is detrimental to economic growth and stability. Singh's analysis implies that the bigger the financial system the more unstable it becomes.

Miwa and Ramseyer (2000) argue that contrary to conventional perception Japan does not have a bank centred economy, but relies on equity finance sourced in competitive markets. However, Hoshi and Kashyap (1999) insist that dependence on capital markets is a direct result of 20 years of deregulation, known as the "Japanese Big Bang." Their paper attributes the protracted Japanese recession in the 1990s to problems in the financial system. It must be clear that this Japanese debate is about the relative importance of segments of the financial sector which we have already seen to complement one another. For our purposes the debate does not dispute the significance of financial factors in economic activity. Rousseau (1999) argues that financial sector deepening contributed to "Japan's rise to world prominence". Rousseau uses a cointegrated VAR system to demonstrate that unidirectional causality operated from financial factors to output and investment.

Levine and others have breathed a new lease of life in the finance and growth nexus. King and Levine (1992,1993) found significant correlation between the degree of financial sophistication and real economic growth. Roubini and Sala-i-Martin (1991,p 1) arrive at similar results. Recently Beck, Demirgüç-Kunt, and Levine (1999) popularised new ratios of size, activity and efficiency to measure banking sector and stock market development. Their study relates economic development to bank, nonbank and stock market development. In Demirgüç-Kunt and Levine (1999) both foreign banks' share and public banks' share were found to have a statistically significant relationship with GDP. Levine (1998) shows that financial intermediation accounts for not only output growth, but capital stock growth and productivity growth as well. Kuh and Meyer's (1963) evidence suggests that financial factors are important in corporate investment. Elliot (1973) supports the hypothesis. In my view Levine's (1998) paper opens interesting avenues for future research because productivity and fi-

47

nancial intermediation are usually considered as separate determinants of economic growth.

Table 2 shows some of the most important studies on financial intermediation up to 1995. Monetary and interest rate aggregates were then the most popular indicators of financial activity. In most cases the researchers found for a positive relationship between financial sophistication and economic growth. The tendency was to analyse financial development in a cross section pattern. De Gregorio & Guidotti (1992) demonstrate that cross-country studies are sensitive to the sample of countries included in the study. Technically both cross section and time series studies are sensitive to the time period considered. Levine and others' popularisation of new indicators of financial sophistication coincided with new time series techniques. At the moment time series studies based on a single country are becoming as common as their cross section counterparts.

2.3 The Theory of Financial Intermediation

This section consolidates the theoretical underpinnings in the financial intermediation literature. Integration of existing theories is important in order to explain the existence and significance of financial intermediation. In classical theories the financial intermediaries "exist by the grace of market imperfections", (Scholtens and Wensveen 2000, p1245) yet Eichberger and Harper (1997, p241) observe that both the theory and practice are rising. James and Smith (1994) agree that for the past two decades the theory of financial intermediation was founded on transaction costs and asymmetric information. In an imaginary Marshallian and Walrasian world of perfect markets, Eichberger and Harper (1997, p246) stress, "Theory is quite unequivocal in its prediction that efficient markets render financial intermediaries obsolete." Benson and Smith (1976) are emphatic the *raison d'e'tre* for the industry is the existence of financial costs. Financial intermediation entails reduction in transaction costs and satisfaction of the demands for time dated consumption. Financial intermediaries provide divisible purchasing power, which is converted into goods and services at low cost at the right time. In this process banks gain economies of scale and scope, which individuals and markets cannot replicate. Spulber (1999, pix)

48

concurs that intermediaries emerge when the gains from intermediated exchange exceed gains from direct exchange.

Author	Year	Coverage	Financial development indicators	Impact on Economic Growth – Key Finding

Table 2

Stylised Facts on Economic Growth & Financial Sector Development

Author	Year	Coverage	Financial development indicators	Impact on Economic Growth – Key Finding
Berthelemy & Varoudakis	1995	World –91 countries	Broad money/GDP ratio	Inadequate financial sector development can inhibit growth
Fry	1993	Developing – 16 countries	Real interest rate	Real interest rate extremes negatively related to growth
King & Levine	1993	World – 80 countries	Liquid assets, commercial bank importance, private credit proportion of total credit, private credit to GDP	Financial sector development positively correlated with economic growth
Levine & Zervos	1993	See Levine & Renelt	Selection of indicators	Financial development positively related to economic growth
World Bank	1993	Asia – 20 countries	Real interest rates, Real curb rates (Korea only)	Mixed evidence on real interest rates, curb rates (Korea) have a positive relationship with growth
De Gregorio & Guidotti	1992	World – 98 countries	Private sector to total domestic credit	Ratio is positively related to economic growth
Levine	1992	World – 87 countries	Money, commercial bank importance, private credit proportion of total credit	Credit aggregates positively related to economic growth
Levine & Renelt	1992	World – 119 countries	Domestic credit growth rate and its standard deviation	Not robustly related to economic growth
Roubini & Sala-i-Martin	1992	World – 50 countries	Real interest rate distortions and bank reserves	Financial repression negatively affects economic growth
Dornbusch & Reynoso	1989	Developing – 84 countries	Quasi-money / GDP ratio	Evidence of positive impact of financial sector development on growth episodic
Gelb	1989	Developing – 34 Countries	Real interest rates, Financial depth (M3) & Financialisation	Positively related to economic growth
Khatkhate	1988	LDCs – 64 countries	Real interest rates	Little impact on economic growth
ADB	1985	Asia – 14 countries	Real interest (deposit) rates	Positively related to economic growth
IMF	1983	Developing – 21 countries	Real interest rate levels; three categories	Positively related to economic growth
Lanyi & Saracoğlu	1983	Developing – 21 countries	Real interest rates	Positively related to economic growth
Fry	1980	Developing – 61 countries	3 equation model of growth, saving and investment	Financial repression negatively affects economic growth
Fry	1978	Asia – 71 countries	Real interest rates	Real interest rates have positive effect on economic growth

Leland and Pyle (1977) propose an information-based theory in which financial intermediaries resolve information asymmetry between borrowers and lenders. Loan contracts contain special clauses to ward off precontract adverse selection, and ex-post effort –aversion and asset substitution moral hazard.

Fama (1980), inspired by the theory of finance, proposes that banks perform two functions: (a) a transaction function and (b) a portfolio function. In a competitive world, banks are intermediaries that respond to the tastes of ultimate borrowers and lenders (i.e. real activity.) The model excludes costs as well as the liability side of the balance sheet. Kashyap, Rajan and Stein (1999) emphasize that the standard distinguishing characteristic of a bank is the simultaneous engagement in two distinct activities on either side of the balance sheet: That is [demand] deposit taking and extending monitored credit [lending]. The dual functions provide liquidity insurance at the cost of forgone interest on cash balances held and double taxation on securities.

Ramakrishnan and Thakor (1984) and Diamond (1984) draw attention to screening and monitoring activities of banks. Ramakrishnan and Thakor (1984) propose that financial intermediaries arise endogenously to screen potential borrowers and provide signals about their creditworthiness. In Diamond's model monitoring requires considerable investment in human, capital and informational technology. Due to information asymmetry and opaqueness of bank loans (Merton, 1992) only specialised institutions, the banks, have the capacity to undertake it. King and Levine (1993) add that intangible assets are difficult to value and only banks have the superior valuation skills to make a difference. King and Levine, as in Boyd and Prescott (1986), content that banks improve productivity by generating signals against inferior investments. According to Mayer (1988), and Shleifer and Summers (1988)[3] the process of monitoring results in long-term relationships, which serve to reduce moral hazard. Economies with better financial intermediaries accumulate more capital, make more efficient investments in intangible assets and human capital, and realise higher productivity.

Notwithstanding financial sophistication in the economy, Stiglitz and Weiss (1981) argue it may be optimal for banks to practice credit rationing because borrowers' credit risk is difficult to observe. High interest rates required to clear the market have a potential to crowd out good borrowers. Indeed Diamond (1991) considers the case where borrowers could substitute safe assets for risk ones to the lender's detriment. Adverse selection can engineer financial collapse. Myers and Rajan (1998) argue the agency costs associated with holding liquid assets are potentially severe in financial institutions, as there is much scope for risk shifting or asset substitution. A very liquid stock increases managerial discretion and thus increases agency costs. In Diamond and Rajan's (1998) model, bank managers do not create value but merely redistribute cash flows once the loan is made. Grossman and Stiglitz (1980) examine the informational content of financial markets, which supposedly emit signals not available in other reported variables such as profits. Stock prices generate information not available to managers, Holmström and Tirole (1994).

The evolution of financial systems is sometimes characterized by the continuing dialectic struggle between financial markets and financial intermediaries as alternative models of financial design. Since Gerschenkron (1962) banks are considered to perform fundamental functions of capital allocation, risk sharing and economic growth. More recently Allen and Gale (1994), King and Levine (1992), Allen and Santomero (1999) and many others have reconsidered the question of financial design and development. In another paper, Santomero and Seater (1998) formally prove that the size of an optimal bank structure is not sensitive to the size or state of the economy but the degree of inefficient behaviour, impact of monitoring on output, and proportion of capital allocated to the banking sector.

Allen and Santomero (1997) emphasize that existing theories are too narrow, as they could not account for the survival of financial intermediaries in the face of falling transaction costs and superior information technologies. As market imperfections continue to recede one would expect financial markets to dominate financial intermediaries. In practice financial intermediaries improve their services, create new markets and new products, to retain their supremacy over market-based alternatives.

51

In Allen and Santomero's (1999) model the complexity and depth of modern markets increase opportunities for risk management. As a result there is need to focus on participation cost, risk trading and risk management. Risk management is one of the most important functions of financial intermediaries. In my view the paper is therefore a very significant contribution to the theory of intermediation. However a brief critique by Scholtens and Wensveen (2000) suggests Allen and Santomero's analysis is incomplete because risk management is not a new phenomenon to the financial sector. Scholtens and Wensveen wholly agree that risk optimisation is crucial to financial intermediation but value addition is equally critical. The emphasis should be on value and financial innovation rather than costs and market imperfections. If a dynamic framework is adopted it would account for product differentiation and customer orientation to both depositors and borrowers. In their view the time has come for literature to stop seeing financial intermediaries as agents but entrepreneurs in their own right. Maybe Schumpeter (1936, p74) was again right to regard bankers as pathologically "the capitalist par excellence."

2.4 Theoretical Perspectives in Corporate Governance

First rule of leadership: Everything is your fault. It's a buggy, buggy world out there Princess.

Hopper in the classic Disney–Pixar animated movie " A Bug's Life."

This subsection reiterates that both corporate governance (internal governance) and external governance have great potential to retard or promote efficiency and creation of wealth. Corporate governance has attracted the attention of the public, academics and researchers because of its connection with the origins of the firm, agency problems, creation of value, distribution of surplus, capital structure, distribution of risk, and the market for corporate control. With regards to financial intermediation La Porta et al (2000) and Levine et al (2000) demonstrate that indicators of governance have good explanatory power. In a financial framework corporate governance is traced to both Ronald Coase (1937) and Adolf Berle and Gardiner Means (1932). Corporate governance

comprises of ways in which agents with vested interests in an institution ensure themselves of getting a fair return on their investment. Separation between ownership and management create several agency problems that are explored in the path breaking paper by Jensen and Meckling (1976). Financing without control may be inadequate in an environment of incomplete contracts. Corporate governance is sometimes discussed jointly with theories of the origin of the firm. Among them the most common paradigms are the nexus of contracts approach, the property view approach, and the nexus of investment approach.

In a broad perspective it is possible to refer to both internal and external governance. Internal governance describes policies, procedures and internal systems designed to manage interest in a firm. From a parochial financial point of view, Smithson (1998, p433) defines risk governance as (1) communication to senior management and Board of Directors (BOD) regarding trading and risk activities, and (2) oversight of a firm's risk exposures by senior management and the BOD. In banks and other financial institutions the BOD is tasked with overall risk oversight within the institution. It approves management policies and operational procedures. The board is expected to implement and enforce approved policies, ensure accumulation of technical and conceptual expertise, and evaluate performance of the institution on an ongoing basis.

Given my concern with overall economic performance, this research also focuses on the macro aspects of governance. External governance emanates from ownership structure, the market structure, and the regulatory environment. Although Alchian (1950) and Stigler's (1958)[4] evolutionary theory of economic exchange argues that competition takes care of corporate governance, it is widely accepted that market discipline is not perfect. In a world of information asymmetry, competitive markets cease to be perfect. In such a realm, economic agencies are not able to predict all future contingencies. In response, incomplete contracts are perversive.

It must be emphasised that a reigning corporate governance system could promote or discourage efficiency. Ex-ante incentives of rational economic agents determine the actions they will take. Activities properly rewarded by a distribution system will receive an optimal amount of resources. Ex-post distribution will determine the extent of ex-ante cooperation. Chandler (1966), cited

in Zingales (1997), discovers that corporate governance also affects managers' ex-ante incentives to invest or politicise allocation of resources. Managers also exhibit power-seeking tendencies. Dissatisfied economic units waste the firm's resources in an attempt to influence ex-post distribution in their favour.

A clear corporate governance system with distinct rights may also suffer from inefficient ex-post bargaining. Defective decisions may be made because of information asymmetry, divergent political interests, and free rider problems. Free rider problems violate Coase's principle of entrepreneur coordination and give managers greater discretion on the use of the funds. Agency problems, that is conflicts of interest, between (1) shareholders and managers, and (2) shareholders and debtors become inevitable. Rational shareholders desire to maximise the value of the firm. According to Wildsmith, "Managerial Theories of the Firm", as cited in Brigham and Grapenski (1991, p10) the primary goal of managers is to maximize the size of the firm. A large firm guarantees management (a) increased job security, (b) increased power, status and salaries, and (c) create more opportunities for lower and middle managers. Management that is no longer useful to a company sometimes self-entrench themselves. Now and then managers resist a loss of benefits and corporate mergers in self-interest. In an effort to minimise agency conflicts shareholders incur monitoring costs, bonding or structural controls, and residual loss (i.e. opportunity cost form restrictions imposed.) Jensen and Meckling (1976), the original sponsors of the concepts, collectively refer to these expenses as agency costs. According to Fama and Jensen (1983a, 1983b) corporate governance may also affect total value of the firm by influencing the distribution of risk. Recent research, (Lorenz, 1999), suggests that reputation and trust also play a crucial part. A good reputation will however not ensure ex-post optimality especially in periods of financial distress when it may be favourable for the borrowers not to repay their debts.

Corporate governance entails control, which in turn influences the distribution of resources and collaboration of other parties. Zingales (1997) defined corporate governance as a "complete set of constraints that shape the ex-post bargaining over quasi-rents generated by the firm." Generally the distribution of quasi-rents is affected by allocation of ownership, capital structure, managerial incentive schemes, labour, and external investors. According to Williamson

54

(1988) the purpose of economic organisation is "to craft governance structures that economise on bounded rationality while simultaneously safeguarding the transactions in question against hazards of opportunism." Bounded rationality is defined as behaviour intended to be rational but is not perfectly so. Both opportunism and gullibility taint rationality hence the acceptance of incomplete contracts in spite of contractual hazards. Often there is need to resort to force of law to address the shortcomings. Therefore governance extends to the economic and legal institutions that may be altered through the political process.

Siddique (1997) points out that literature on economic development is at a crossroads. On the one hand liberal economists consider globalisation and free markets to be "the ultimate goal for developmental economics" which will eventually solve the problems of poverty and under-development. The other group now emphasises institutional issues (such as governance) ahead of structural prescriptions of the Bretton Woods Institutions. The failure of structural adjustment programs in Nigeria and Zimbabwe has been blamed on poor governance. Poor performance of Latin American countries has also been traced to their government's poor financial policies

Africa has failed to use external aid for productive purposes. Adam and O'Connell (1997) highlight that Sub-Saharan Africa (SSA) is the poorest and most aid-dependent region in the world. It registered the slowest growth between 1960 and 1990. Michael Todaro (1994, p642) concurs that decline and deprivation were worse in Africa than in any other region in the 1980 and 1990's. Todaro reiterates, "sub-Saharan Africa poses the greatest challenge to world development efforts..."

Many, including Joseph Stiglitz, the former chief economist at the World Bank, now doubt the therapeutical potency of the "capital storage" and "policy failure" diagnosis in absence the of strong institutional arrangements. Institutional issues are very difficult to calibrate and notoriously very controversial. Sceptics argue that the issue of governance is a vanguard for liberal Western Ideology. Massive empirical evidence, however, suggest that governance and agency problems are essential issues both at corporate and national level. In a highly influential and critical paper Black, Kraakman and Tarassova (1999) blame institutional failure for rampant corruption, increase in organized crime

and economic collapse following economic liberalization in Russia.[h] The authors argue convincingly that good governance boosts economic performance and give graphic accounts to demonstrate how an institutional vacuum breeds self-dealing, dishonest, corruption and economic collapse. Market transactions and contracts require a high degree of social trust and recourse to law enforcement when necessary.

Hellman, Jones, Kaufman and Schankerman (2000) argue that corruption thrives where there is weak rule of law and states are powerless to control the degree of discretionary power" of their own bureaucrats. Low accountability also reinforces corruption. Kaufmann et al (1999(a), p3) note, "available indicators of governance are noise measures of true "governance ...which may underestimate the impact of governance..." Hellman et al (2000, p5) show that corruption is a multidimensional spectrum. It ranges from bribery (grease payments) on a micro level to state capture on a macro level. State capture reflects grand corruption under which organs of the state and the legislative process are influenced, and directed through private payments and interests. Policy making ceases to be predictable and transparent while the legal system looses its potency to "protect property and contract rights." In such an environment business shuns publicity and customers cannot effectively benefit from the informational role of prices.

In the Zimbabwean context issues pertaining to governance, transparency and accountability are given lip service and seldom practised as a business culture. Meda (1999, p 5) shows that the ruling party, ZANU PF, failed to implement a self-imposed "Leadership Code" ostensibly due to semantic disagreements on "a definition of a leader." The real threat was fear of exposure by those who had used their offices to amass wealth, because the code required declaration of personal assets. In the late 1980s, the very popular "Sandura Commission" (1989) confirmed fears of an increasingly sceptical general public that self-dealing and scheming were rampant among public officials. Government largely ignored a lesser-known "Smith Report" (1989), which recommended sweeping rationalisation of Zimbabwean parastatals, although the

---

[h] Causation between governance and corruption is not yet clear. Siddique [1997, p15] suggests corruption springs out of poor governance. "Corruption springs out of poor governance. Accountability, transparency and free flow of information are all distasteful medicine to corrupt people".

commission worked on the project for about four years. After all public commissions are expensive processes. The dismal Constitutional Commission and a resultant national referendum of 2000, set up by government to counteract a constitutional review process pioneered by an independent National Constitution Assembly (NCA), used about $767.2m.[5] A number of other reports in colonial and independent Zimbabwe were never implemented. Some as instanced by the "Matebeleland" and the "Chidyausiku" reports never saw the light of day. A well-known "Nyanga Bus Disaster Fund", collected from well-wishers touched by the tragic death of 91 school children and teachers in 1991, had not yet been disbursed to the intended beneficiaries by December 2000[6]. Trustees of the fund handed the money to Civil Protection officials in 1993 where it possibly disappeared into unknown coffers. I have argued elsewhere that the decadence is not exclusive to government officials. Standard Chartered Bank, the oldest and biggest bank in Zimbabwe, refused to reinstate 211 workers dismissed after a 1997 wage dispute despite a Supreme Court ruling and "condemnation by the International Labour Organisation."[7] Given the difficult conditions prevailing in Zimbabwe in year 2000, ten of the employees who have since died might have been precluded from calling upon the fruits of their labour in the darkest hour of their need. A culture of skirting the law, whether in public or private sector, is tragic because sustainable long-term prosperity requires some degree of trust.

The "Leadership Code" was not applicable to the private sector executives, a loophole quickly exploited by government officials as a personal disadvantage. Meda (1999) highlights the lack of appreciation among public officials of a "distinction between public and private resources." He acknowledges that the "Prevention of Corruption Act" does not foster a culture of business integrity because it is difficult to enforce. To resolve this predicament Meda suggests that an already existing "Standing Committee on Parliamentary Rules and Privileges" be upgraded into an independent people's commission reporting to parliament.

Although Meda has very stimulating ideas regarding the constitution and operations of the commission, his proposed commission is not destined to be innovative. Why should all members of the commission be hand picked by the president (p6) with parliament subordinated to ratification? Under the present constitutional arrangements, the president currently appoints executives to head

government and quasi-government institutions, as well as 20 parliamentarians, but that does not guarantee their competency, impartiality and intellectual independence. In any case the immediate problems in Zimbabwe do not stem from the want of adequate legislation and commissions, but lack of political will to implement solutions already in our national cardboard. In December 2000 the magistrates' courts had a backlog of about 24000 cases and was understaffed to an extent of 37 magistrates.[8]

I am not arguing away imaginative solutions to the problem. My point is unless we mean what we say there is no redress. We have laws but justice is not done. Creating institutions that cannot execute and discharge their declared mandates is not a meaningful economic exercise. Alfred Marshall, cited in Webster put great emphasise on intangible assets (non-material wealth) by illustrating that it took centuries to replenish knowledge lost following the fall of the Roman Empire while destroyed materials were replaced within decades.

The constitution of good governance is another problematic issue. For some, democratic elections are not an accurate measure of political rights or a critical determinant of economic growth. Gastil [1991] cited in Barro (1997, p53) suggests "Political rights are rights to participate meaningfully in the political process ... vote and compete for public office, and for elected representatives to have a decisive vote on public policies". Barro adds that minority parties should also have influence on policy. Kaufmann, Kraay and Zoido-Labatón (1999a, p2) regard rule of law, government effectiveness and extent of graft as the three fundamental aspects of governance. While the extent of graft cannot be readily assessed due to its secretive realm, Zimbabwe continues to fall short on rule of law and government effectiveness. [For justification see Freedom House and the World Economic Forum annual ratings.] Suffrage is not an automatic guarantee for economic prosperity. In Barro's view increase in democracy at, low levels of political rights stimulates economic growth. Barrow notes, "once a moderate amount of democracy has been attained further expansion reduces growth".

It has been argued that dictators come in two types. Those who loot national wealth for personal gain (e.g. most African dictators) and those preoccupied with economic development. The former is detrimental to economic

growth. Schwartz (1992) cited in Barro (1997, p51) notes that some OECD countries increased economic liberties before their democracies became fully fledged. Good governance does not need to find or create innovative ideas, as general society produce talented men and women to fulfil that role. This means that a good leader does not need to interfere with everything of economic and social significance. Subordinating economic opportunity and employment to partisan interests such as political affiliation to a ruling party, (ZANU PF in Zimbabwe's case), could be detrimental to economic prosperity. Schumpeter (1936, p88) suggests that leaders fulfil their function "more by will than by intellect" and more by "authority," "personal weight," and so forth than by original ideas. Kindleberger and Herrick, (1977, p2) insist that matters of governance require foremost concern as they affect human condition. Haavelmo (1944, p115) agrees that economic research must pool its expertise and resources because national income and the welfare of "millions" might depend on it.

2.5 Approaches to Economic Growth And Development

"Development problems", Kindleberger and Herrick (1977, p21) reiterate, "... are problems of policy." Typical literature and research characterise economic development as a process amenable to sound and proper management and policies. There is no single measure of development because structural issues such as extent of poverty, income distribution, social and political change, literacy, leisure and economic wellbeing come into play. Kindleberger and Herrick (1977, pp6-7) use terms such as "multiplicity ", "multidimensional", "multifaceted" and "multivariate" to bring home the reality that economic development is idealistically a broad based spectrum of indicators. They propose a long definition that needs no edification to pinpoint issues involved. "Economic development", Kindleberger and Herrick (1977, p1) highlight,

> is generally defined to include *improvements in material welfare*, especially for persons with the lowest incomes; the *eradication of mass poverty with its correlates* of illiteracy, disease, and early death; changes in the consumption of inputs and output that generally include *shifts* in the underlying structure of production away *from agricultural toward industrial activities*; the organization of the economy in such a way that promotes...[*employment* of many rather than] a privileged minority; and...*greater participation ... in*

59

making decisions about the directions, economic and otherwise, ... to improve their welfare. (P1, italics added.)

Economic wellbeing is therefore a function of several proxies whose calibration may not be easy in practice. Traditionally, Gross Domestic Product (GDP) is accepted as a measure of national income (Y) and economic size while GDP per capita is the most popular proxy for average human welfare. The rate of change in GDP per capita (GY), over two periods in time depicts the speed and direction of changes in wellbeing.

Development and economic growth theories gained popularity after the Second World War (WW II). The literature is focused on unsophisticated economies such as Zimbabwe. Kindleberger and Herrick (1977, p4) note that poor countries were "initially known" as "backward" after WW II, a term which is "unfortunate, given its connotation of inferiority that go beyond simple lack of sophistication." The term "underdeveloped" was later preferred as it signalled a potential for improvement. However, Myint cited in Kanth (1994, p17) is of the conviction that underdevelopment means backward. The term implies "underdeveloped resources and backward people, " a combination argued to constitute the "Third World." The reader should note that by definition a "backward" people lack sophistication that is a prerequisite for development. This creates a vicious circle. Kindleberger and Herrick (1977, p4) disagree with this interpretation. In their view the term Third World was coined to indicate political nonalignment with both NATO (North Atlantic Treaty Organisation) and the Soviet – Eastern bloc. Schumpeter taught us that development requires emergence of innovators in society. Eventually the Third World was "apologetically," (Kanth 1994), referred to as "developing countries" a term which Kindleberger and Herrick (1994, p4) consider flattering because it reflects diplomatic sensitivity rather than semantic accuracy. The authors are also uncomfortable with the popular initials "LDC" for less developed countries because this cold designation resembles the substitution of abbreviations such as "VD" to keep sensitive terms at "an arm's length."

For the purpose of this research any term other than "backward" will do. The typical features are well known. Underdevelopment denotes poorly developed economic sectors, over reliance on production of primary products, as well as economic domination by external market forces. The bulk of export produc-

60

tion is not diversified but typically concentrated in a few lines of items. In extreme cases most manufactured products are imported. Foreign currency shortages, debt and balance of payment crisis are in most cases not uncommon. The proportion of inhabitants below the poverty datum line is typically high. A high proportion of agricultural output in an environment with insignificant services and manufacturing sectors are often regarded as signs of underdevelopment. Extreme poverty and heavily skewed income distribution are also witnessed with disheartening frequency.

Increased interest in economic growth and development literature has led to a proliferation of empirical work and theories. Michael Todaro, (1997, p70) who interprets development as a "multidimensional process" summarises development literature into five competing categories. These are (a) the linear stages of growth model; (b) theories and patterns of structural change; (c) the international dependence revolution; (d) the neoclassical, free market counter-revolution; and (e) the endogenous theory of economic growth. Most theories concentrate on capital formation, a term used to describe increases in net investment in capital assets.

The linear stages model was developed soon after World War II and dominated growth literature in the 1950s and 1960s. Rostow's Stages of Growth is the most well known. Rostow proposed that countries evolve from being underdeveloped to development through a series of steps. In particular nations make strategic choices from "take off" to "maturity." According to the model each economy needs to pass through five stages. These are (1) traditional society, (i.e. pre-industrial), (2) preconditions for take off (use of scientific methods and structural change), (3) take off where growth is the norm and is facilitated by saving and investment, (4) maturity under which the focus is on improvement in an effort to expand technology, (5) mass consumption accompanied by an increase in per capita income.   This model identified mobilisation of domestic and foreign saving as "the pre-conditions for take off into self sustaining growth." The successful US export of technical and financial resources to war torn Europe under the Marshall Plan lends support to the model.

Lauded as an alternative to Marxism in the West, Rostow's model was severely criticised by its socialist opponents for being tautological. Critics con-

sidered it to be a descriptive account rather than a theoretical model based on scientific analysis. There is no good reason why social and economic forces should follow a deterministic sequence of development.

The Harrod-Domar Growth Model explains how saving and investment ratios are related to economic activity. Domar (1957) posited that economic growth is a function of the amount and rate of net capital investment. Capital accumulation in turn is causally linked savings. The latter in turn depends on surplus income. Surplus income itself is a function of increased productivity. Nurkse (1962)[9] describes this chain of causality as a "vicious cycle" where "success breeds success" and "poverty breads poverty". Poverty creates a vicious developmental trap: *murombo haarovi chinenguwo* is popular Shona saying. Theoretically, exogenous intervention is required to break the cycle. Popular solutions are foreign direct investment, external borrowing and export promotion. In practice not much improvement is noticed on the ground.

The Solow growth model, named after the Nobel Prize economist Robert Solow, assumes constant returns to scale in the growth of capital stock, labour force, and technological innovation. Critics condemn the model as mechanistic.

Some economic growth theories have drawn attention to qualitative factors such to the development question. In Schumpeter's (1936, p66) view development encompasses creating new products, "new quality", industrial reorganisation and the "conquest of new sources of supply." The level of consciousness, the value system, religion as well as other social beliefs are also regarded as crucial determinants of economic prosperity. Marx Weber's "Protestant Ethic And The Spirit of Capitalism" (1930)[10] is credited with the pioneering of individual-level theories as well as the "primacy of ideas" as an answer to Karl Marx's preoccupation with the organisation of society; Jaffee (1990, p20).

Admittedly it is apparent that economic development is more than quantifiable economic factors. However, the causality between social and cultural factors on one hand and economic development on the other is difficult to infer let alone interpret. Jaffee (1990, p21) argues, "Weber's analysis does not posit causal ordering" but mutually reinforcing ideas, since capitalism existed before Protestantism. In fact Portes (1976), in Jaffee (1990, p34) argues that subjective factors, including values, attitudes and beliefs are exaggerated. Ethnic "par-

ticularism", like personal traits theories, whether individualistic or holistic, is fraught with bias and subjectivity. In Portes' view opportunities for acquisition are predetermined by "the socio-economic position of individuals" rather than level of consciousness. The "need for achievement" is also moderated by structural constraints. Take a practical example of Third World postgraduate international students in Western institutions. One finds accountants, bankers, economists, financial analysts, civil and electrical engineers – marooned by socio-economic forces – unable to land part-time jobs in the fields of their calling. These men and women end up taking menial jobs such as brick packing, food processing and other forms of labouring. It would be naïve and offensive to suggest they lack the determination to succeed.

Causality between education and productivity is also open to question unless other necessary resources are available. Education without equal opportunity is dysfunctional. High literacy rate, for instance has not reduced poverty in Third World countries. The educated that are unemployed, argues Jaffee (1990, p40-42), "are likely to emigrate or to create political difficulties...[and even] generate social regression and 'political decay'...[because of labour's] ability consciously to reflect on its role and situation. "

In many countries meaningful participation in the economic and general prosperity often followed reorganisation of political and economic structures against those with vested interests and patrons of privilege. In Britain feudalism had to collapse for the Industrial Revolution to succeed. Remarkable Japanese economic prosperity after WW II is often traced to moderation of the Zaibatsu economic system. In the next chapter I propose that Zimbabwe needs to overcome her Machiavellian economic practices to attain sustainable economic prosperity. Class structures based on castes, apartheid or tradition usually come with unequal opportunity. The "American Dream", though not perfect, is based on equal opportunity. However, equal opportunity is not equity.

Development economics often grapples with contradicting demands of equity and growth. Champions of laissez-faire economic policies believe income disparity or *functional inequality* is good for growth. They criticise extensive welfare policies; insisting on *"growth first, [trickle down] latter"* Economic activity based on redistribution (consumption), they argue, cannot be sustained in the

long term because it destroys incentives to increase productivity (production) hence retards economic growth. I agree with Jaffee (1990, p107) who argues that the laissez-faire analysis is fraudulent. At least in the Third World, I qualify. Policies adopted by developing countries, with the blessing of the Bretton Woods institutions, to promote economic growth often result in what Jaffee terms a "trickle up effect" at the expense of mass poverty among the poor. The socialist answer to the problem is *redistribution first, growth later.* Jaffee right-fully notes that "the land reform version of the model" is most common across nations. One does not need to be a Rosa Luxemburg to find that the original objectives are never fulfilled. At any rate the dismal failure of Communism in Eastern Europe suggests that this extreme approach is counterproductive in the long run. At independence in 1980 Zimbabwe adopted an alternative approach, "Growth With Equity" also known as *redistribute-with-growth.* The intention was to promote investment and growth on one hand while ensuring equity by delib-erate income policies, taxation, mass education and free health. Unfortunately Zimbabwe accomplished neither growth nor equity by the highly romanticised "Year 2000." Paul Streetten (1977)[11] criticises *growth with equity's* heavy reli-ance on uncertain income policies that leave both growth and equity to chance. Under the *basic needs* framework government provide for essential material needs, services and public utilities unlikely to be optimised by pure market forces. In my view government has an option to provide for these services di-rectly or indirectly through dole. Intuitively dole is more palatable in capitalist economies than direct government participation. However, growth is still not guaranteed and the equity – growth dilemma not resolved.

According to Jaffee (1990, p26) there exist a penchant "to cite the most ideal and romantic elements of Western capitalist structure as the necessary conditions for the socio-economic development of Third World nations." The emphasis is on "stability and harmony" rather than struggles for positive change (p35). Even international institutions such as the IMF have been accused of peddling politics rather than policy. Internalisation of rose coloured Western Values in some ways retards Third World development. To quote Jaffee (1990, p35) who follows Portes (1976):

64

Third World individuals who have had the greatest exposure to Western Values of entrepreneurship and consumption, [have] a legacy of elite behaviour bordering on fraud, corruption, co-option, and conspicuous consumption. [They] squandered valuable foreign exchange [importing] Western luxury products.

Results from Russia suggest that efforts towards incorporation and privatisation in an environment without sound institutional structures are destined for long term discredit; especially when the contracts cannot be enforced, and self-dealing kleptocrats[i] remain untouchable. Black et al (1999, pp 3&10) identify lack of political will, "a punitive tax system, [rampant] official corruption, organised crime, an [business] unfriendly bureaucracy", and "a business culture [of] skirting the law" as the main "micro failures" behind the shrinkage of the Russian economy between 1991 and 1999.

In any case the Japanese economic success prior to the 1990s taught the world that self-interest and "possessive individualism" are not the only panacea for economic prosperity. Furthermore I agree with Schumpeter (1936, p58) who is explicit "For the economic state of a people does not emerge simply from the preceding economic conditions, but only from the preceding total situation."

Beliefs, even when backed by scientific evidence can sometimes go wrong. As Davies (1997, p88) put it

> [One can make a long list] of all the times religion has prevented scientific truths from surfacing. The reverse question is also interesting: How often does science prevent other truths than its own from being heard?

Students of finance need no prompting to recall problems and resistance Sharpe (1964), Black and Scholes (1971) and Bachelier (1900) encountered in order to publish their seminal papers.

---

[i] In the Russian context most resources used to be state owned. Kleptocrats are defined as "a handful of well-connected men who made their first millions – and sometimes billions – through sweetheart deals with or outright theft from the government, and then leveraged that initial wealth by buying major companies from the government for astonishing low prices." Kleptocrats sometimes give conniving state officials "financial inducements to put a good spin on a dirty process..." Black et al (1999, p5).

3. FUNDAMENTAL BACKGROUND TO THE ECONOMY

The modern state is nothing but a conspiracy to exploit, but most of all demoralise its citizens...Political laws seem to me such prodigious' lies, that I fail to see how one among them can be better or worse than, any of the others...Henceforth I shall never serve in any government anywhere... Governments are intricate institutions, sanctified by tradition and custom, for the purpose of committing by force and with impunity the most revolting crimes.[j]

L. N. Tolstoy in "War and Peace"

3.1 An Analytical Overview

To become a millionaire in our country it is not at all necessary to have a good head or specialised knowledge. Often it is enough to have active support in the government, the parliament, local power structures and law enforcement agencies...In other words, you are appointed a millionaire.

Pyotr Aven (1994) in Black et al (1999)

The purpose of this section is to put in perspective governance, and the general mechanics of income generation, accumulation and distribution in the Zimbabwean economy. It is hoped to provide a better understanding of the economy's current, potential or realised productive capacity. Economics, finance and public administration coexist and cross paths on a daily basis. The evolution of the financial superstructure in Zimbabwe is not immune to the socio-economic forces that ushered her birth. Understanding the Japanese Zai-

---

[j] I read "War and Peace" in 1990. Due to youthful and intellectual inexperience I did not take down proper page details. Though struck by Tolstoy's disillusionment, alternatives seem bleak. Without the government convention, life could also be "nasty, brutish and short" in the Thomas Hobbes sense.

batsu concept, for instance, throws more light onto their financial system. As forcefully put by Chimombe (1983, p56) " ... comprehension of that background facilitates evaluation" of the role of the Zimbabwe financial system. To augment Taylor (2000, pp13 and 197) current productive capacity in any economy at any given point in time is a legacy of past investment decisions, creation and distribution of wealth. I agree with this assessment because abundance of productive resources, which is not necessarily a function of economic organisation, only provides the potential for economic growth; transformation to actuality is not invariant to institutional structures. Bartlet (1987, p12) quips, "Economics, unlike Justice, is by no means blind." Mankiw G. N. (1997, p371-372), citing Alberto Alesina's (1988) "Macroeconomics and Politics", found that the historical performance of the USA economy between 1948 and 1997 "is usually low, and often negative, in the second year of Republican administrations... By contrast, the economy is usually booming in the second and third years of Democratic administrations." See Table 3 for full details that suggest the American people elect Democrats to fire up the economy and Republicans to cool it down.

Table 3

US Real GDP Growth During Democratic And Republican Administrations

Democratic Administrations

President	Year of Term			
	First	Second	Third	Fourth
Truman	0.4	8.7	9.9	4.3
Kennedy / Johnson	2.7	5.2	4.1	5.6
Johnson	5.5	5.9	2.6	4.2
Carter	4.5	4.8	2.5	-0.5
Clinton	3.1	4.0		
Average	3.2	5.7	4.8	3.4

Republican Administrations

President	Year of Term			
	First	Second	Third	Fourth
Eisenhower I	3.7	- 0.7	5.6	2.0
Eisenhower II	1.9	- 0.5	5.5	2.2
Nixon	2.7	0.0	2.9	5.1
Nixon / Ford	5.2	- 0.6	- 0.8	4.9
Regan I	1.8	- 2.2	3.9	6.2

Regan II	3.2	2.9	3.1		3.9
Bush	2.5	1.2	- 0.6		2.3
Average	3.0	0.0	2.8		3.8

Source: Bureau of Economic Analysis, as cited in Mankiw G. N. (1997, p372)

3.2 Competing Paradigms

Colonial development apology

There are two competing neo-orthodoxy stereotypes conventionally used to interpret the behaviour of African economies: colonial development apology and underdevelopment theory. The implications of this philosophical dichotomy have rendered any debate in Zimbabwe very polemic.[k] I am not the only one to arrive at this deduction. Carol Summers (1994) in "From Civilization to Segregation", is stunned, "Almost all the words available to discuss social change in Southern Africa carry either pejorative or problematic associations and implication", (pxi). More strongly she notes of the colonial sources, "None are neutral"(pxi). In extreme cases, they amount to public propaganda. Yet some political science professors see polarisation as a mark of scholarship. As Masipula Sithole (2001) puts it, "For in scholarship, there is rarely room for compromise."

A colonial development analysis regards the arrival of Europeans in Africa and subsequent subjugation as a blessing in disguise that was essential to bring the light of civilisation to The Dark Continent. Grant (1973, p3) acknowledges that colonialists brought with them "a new pattern of law and order – if not justice; they introduced western educational and medical services, as well as sophisticated commercial and mining methods; ...brought Christian religion ... they provided roads, rail, telephone and postal links ..." A colonial development analysis emphasises superior personal traits of Europeans over those of Africans. This discourse may be equated to what Jaffee (1990, p7) characterises as individual level theories in a "nested hierarchy" of theoretical analysis

---

[k] Readers of a prudish disposition are hereby consoled that any pain suffered henceforth is not deliberate. The intention is not to pass a verdict on morality issues but to explore facts. On the academic front, the dichotomous debate on whether education should follow an intrinsic value or a utilitarian approach does not concern us here. Both have genuine merits and severe flaws and are not mutual exclusive.

stretching from individual theories at the lowest rung, through to organizational, societal and international theories at the apex.

> These [individual] theories of development focus on the values, motives, attributes, and characteristics of individuals as the source of socio-economic development. [They] emphasize individual traits such as the level of achievement motivation, the degree of entre-preneurial talent, the attachment to modern ideas, or the posses-sion of human capital. These perspectives share the assumption that individual characteristics translate into national social devel-opment.

In typical colonial myth "underdevelopment in Africa was due to the ab-sence of an economic spirit among Africans," Mosley (1983, p1.) Settlers, Frankel (1938) elaborates, regarded African civilization as "meagre hoe-culture or pastoralism" which had to be "compelled to develop a new order." Even mis-sionaries such as Robert Moffat, an eventually treacherous guest at King Mzilikazi's kraal, for years dismissed "natives" as a people with "nothing natu-rally engaging, their extreme selfishness, filthiness, obstinate stupidity, and want of sensibility..."[12] Philip Mason (1958, p71) points out that some English observers once wrote off the Irish as rude, unclean, and lacking in "civility, hu-mility, or any manner of decency..." and considered their matrimony no more "than conjunction between unreasonable beasts." Similarly one would not miss the contempt with which Russian officials held German soldiers during Napo-leonic Wars as depicted in Tolstoy's War and Peace, yet today their country is an economic powerhouse. Of course at their peak the Irish had considerable achievements in scholarship and missionary work.

Early African achievers such as Hannibal of Carthage (247-182 BC), Augustine of Hippo (354-430 AD), Egyptian and Nubian dynasties (3100 – 332 BC), Tshaka "The Zulu" (1787-1828), and Mwene Mutapa Kingdom (c1000 - 1837), which resisted Portuguese expeditions to Zimbabwe between 1561 and 1667, are easily forgotten. The biblical Moses also received African instruction. Sympathetic observers such as Dr. David Livingstone noted that Africans had well developed ideas of what is right and wrong. He was advised, according to Mason (1958, p26), that they knew "we should not lie or kill or steal ... except that we must not have more than one wife." Persian and Arabian geographers report gold mining in Zimbabwe as early as 947 AD to 1060 AD.[13] Meda (1999,

p4) notes that colonisers were "actively antagonistic" and contemptuous of African social and religious way of life, whose complexity they did not understand. In the end Missionaries and settlers alike applied their own standards and customs. Cattle for instance, were as valuable an African source of wealth and insurance against poverty as are equities in a modern market economy, yet settler governments in Zimbabwe insisted on compulsory de-stocking.

Apart from personal traits empirical research has validated causal links have been suggested between economic performance and other societal and cultural values. I have highlighted earlier on that the direction of causality could be bi-directional. Marx Weber's "Protestant Ethic And The Spirit of Capitalism" (1930) is one of the earliest to relate society's ideas, values, beliefs and the urge for achievement to economic activity; Jaffee (1990, p20). Frankel (1938, p2) continues the colonial argument, highlighting the supposed want of creativity among Africans.

> Unlike the Indians or Chinese, Africans had practically nothing to offer, and as little to demand, from traders who visited them. The only trade of real consequence which could be developed for centuries was the slave trade, the export of Africans themselves 'a trade which destroys all others'.

Some colonial apologists accepted complete expulsion of Africans off the land into extinction. In Frankel's (1938, p8) opinion colonization could have provided automatic solution to African development:

> If the indigenous population had disappeared before the advance of the white man, as the Indians did in America, and if its climate had favoured European settlement, ...[Fortunately] instead of decadent population, rapidly tending to extinction, the intending settlers encountered a race virile, increasing and racially potent.

Philip Mason (1958, p 215) points out that the original inhabitants of North America and Australia disappeared with "some active assistance from the invaders." Indirect assaults included esoteric products and diseases such as "gin, tuberculosis and syphilis," and directly bullets and arsenic. The "persistence and virility" of the Bantu peoples was considered undesirable. Ironically, Colonial Central Africa was also universally dependent on the labour of the indigenous population to safeguard the interests of a permanent European set-

tlement. On the other hand African economies were self-sufficient hence had no incentive to work for the Europeans. Settlers introduced forced labour. Frankel (1938, p11) noted that "methods of compulsion" included direct force, conscription and indirect taxes. Expropriation of land was designed to permanently destroy traditional economic self-sufficiency. As noted by Mushayakarara (2001)[14],"In fact colonialism reinforced feudalism in Africa."

Although personal trait theories incidentally promote ethnicity and other forms of discrimination based on race, colour, religion and sex, they continue to be proven empirically valid. A latest example is William Easterly's (2000) "Middle Consensus" that regards low ethnic diversity and low class heterogeneity as "critical determinants" of economic growth (p2). Economic shrinkage of the Soviet Union, for instance, is liked to "hallowing out" of the middle class whereas poor economic policies and performance in India, Guatemala, Mexico, Kenya, Nigeria, Sierra Leone, Zambia and Africa in general are attributed to high linguistic and or ethnic diversity, (p5). On the flip side *miracles* in Japan and Korea owe their origin to a *middle class consensus*. Some races, for example Chinese in East Asia, Lebanese in West Africa and Indians in East Africa are found elsewhere to be more enterprising than others. Of course Easterly's conclusions are not new. Kindleberger and Herrick (1977, p28) found it "hard to avoid the conclusion that [ethnic] diversity is a handicap to development."

Ethnic "particularism", like personal traits theories, whether individualistic or holistic, is fraught with bias and subjectivity. Rosenthal and Rosnow (1996) lament, "Belief is easily confused with evidence, evidence is easily misunderstood, and misunderstanding perpetuated." Generally countries in Africa are larger than those in Europe; hence it is not surprising to find linguistic differences. In any case different peoples in say Nigeria and Indonesia were arbitrary put together by colonial masters. Agreed talent is not ubiquitous and all virtues not the same, but too much generalisation is harmful to economic prosperity. There is no reason why ethnic diversity, a worldwide phenomenon, should be the same as ethnic polarisation. Switzerland, for instance, has achieved respectable political stability and economic prosperity despite linguistic diversity among member cantons and extensive political decentralisation. And contrary to Weber (1930) some non-protestant countries are economically successful.

71

In my view personal trait theories teach readers that sustainable development requires sound economic institutions and willpower to enforce the right decisions. Schumpeter (1936, p86-7) is again right that the psyche of success economises decision-making and production because it is subconscious and thus works automatically. Primitive societies are more resistant to change, subject innovators to "social ostracism ... physical prevention or to direct attack."

Underdevelopment theory

The underdevelopment theorist reads all the seeds of African underdevelopment in both slavery and colonialism itself. Propagated by socialist philosophy, and abetted by communist ideology, the underdevelopment theory emphasises the materialist interests of colonial domination. This was forcefully argued by Lenin's (1917) "Imperialism: The Highest Stage of Capitalism", cited in Chimombe (1983, p44). In this light imperialism was a direct result of the struggle among colonial powers to establish monopolies over material resources. In Zimbabwe, as elsewhere in Southern Africa, land expropriation decimated peasant economies. The results are still being felt today. Whereas forced labour reduced skills in African areas compulsory land acquisition led to untold overcrowding in reserves designated for African use. Grant (1973) notes that the land would take years to recover even if left fallow. Stringent discriminatory laws curtailed peasant industrial activity, as we shall see infra. Even Frankel (1938, p17) admits that European Settlers introduced policies of deliberate economic exploitation. In his own words

> The mid Victorian Empire did not seek to colonize the wilderness.
> It was an imperialism that was mainly interested in colonies and
> enterprises that could pay their way.

Cecil Rhodes, cited from Lenin (1917) by Chimombe (1983, p45) was more forthright: "The Empire, as I have always said, is a bread and butter question: If you want to avoid a civil war, you must become an imperialist." This view is supported by Schumpeter (1936, p10) who contends "Economic activity may have *any* motive, even a spiritual one, but its *meaning* is always satisfaction of wants." Several generations after colonisation, self appointed guardians of civilianisation in Africa were indeed forced to relinquish their empires, along with

the accustomed comfortable way of life, after many difficult years of resistance. African policymakers have sporadically raised the question of reparations with the West on the basis of the underdevelopment theory. Germany's obligations to make good the past misdeeds of the Nazi era seem to vindicate the claim.

However, according to some critical Western scholars Africans exaggerate the 'supposed' demerits of colonisation. Colonial settlers introduced clothing, transport, education, hospitals, and advanced technology to an uncivilised society, they argue. Pre-colonial Africa is deemed to have been on the verge of total collapse due to tribal wars and raids. Those postcolonial African leaders given the opportunity to demonstrate otherwise have dismally failed to rise up to the challenge. Septics argue there is nothing to write home about in Africa since the "winds of change" first swept across the continent in the midst of the last century. According to Mosley (1983, p1) settler colonialism as practiced in Kenya, Southern Rhodesia, Algeria and South Africa does not fit in the convectional centre exploiting the periphery framework. In his view, these

> settler economies quickly develop[ed] an economic nationalism of their own and that extent fail to fit the classical-imperialist model of underdeveloped countries whose economic policy and development are dictated by the needs of the European metropolis.

A careful reading of other researchers' work suggests Mosley's thesis amounts to a generally creative interpretation of economic realities. According to Phimister (1988, p 117) the Letters of Patent authorising self-governance in Rhodesia were "considerably circumscribed" by reserved clauses. The clauses were designed to stop Southern Rhodesia from passing laws contradictory to Imperial interests as well as curb discrimination against Africans. Laws dealing with the railways were expected to meet British specifications. The colony had no jurisdiction over "extra-territorial matters" such as the currency. In fact there was no Rhodesian citizenship before 1945. The 'Rhodes clause' stipulated that British goods could not be subjected to differential tariffs not levied elsewhere in the Empire. Ian Smith was actually the first and last native born Rhodesian Prime Minister. Technocrats heading important international companies sat in the Legislative Assembly. According to Phimister (1988, p119) closely knit economic interest were concentrated in a few hands. One Sir Edmund Davis, an

Australian national, held influential positions "on the boards of more than 50 [notable] companies." Phimister (1988, p119) reports that by 1939 Davis was

> Powerful enough to 'make or break the Rhodesian economy' several times over, Davis often loomed large in the calculations of settler politicians. 'Everybody knows that the economic dictator of this country is Sir Edmund Davis'...

On the political front the relationship between Britain and Rhodesia has been described as an unconsummated union. The British government never took direct control of the colony. It soon abdicated its self-declared provisions to protect Africans from settler discrimination. For the first 33 years since colonisation, the British South Africa Company (BSAC), a private company founded by Cecil Rhodes, a colonial entrepreneur, empowered with a Royal Charter in 1889 administered Zimbabwe. Despite fraudulent assurances to overseas investors regarding the vastness and richness of the 'New Eldorado' systematic looting soon became the main form of capital accumulation to both the settlers and the Chartered Company.

> Armed gangs of settlers and contingents of B.S.A. police equipped with Maxim guns, roamed across the country side, taking what they could... [And] refusal to reveal where cattle were hidden could end in death, as indeed it did for four women 'shot in cold blood'. (Phimister 1988, p16)

In the eyes of most Africans, Charter Rule was violent, manipulative, vindictive and ruthless. Forced labour was widespread. According to Cobbing (1976)[15] raids for forced labour and cattle were characterised by "violence, including molestation and rape of women." Settlers lost no time to implement Machiavellian policies bordering on Darwinism. "Africa south of the Zambezi," Sir Harry Johnson (1893), cited in Mason's (1958, p214) "Birth of a Dilemma", declared, "... must be ruled by whites, developed by Indians, and worked by blacks." By 1897 Johnson's (leading administrator in Malawi) stance had hardened, "the weakest must go to the wall", the verdict descended, "and the black man must pay for the unprogressive turn his ancestors took some thousands of years ago..."(ibid). Protective legislation was ignored with impunity.

Phimister (1988, p55) characterises conditions then prevailing on the mines as "economics of death and neglect." Forced labourers were subjected to

low wages, physical assault, and restricted to prison type compound barracks under armed guards. Brutality and coercion on compounds was backed by force of law through the Masters and Servants Ordinance of 1901 and the Native Pass Ordinance of 1902. In Phimister's (1988, p52-54) words the conditions were so grim that it was a "regimen guaranteed to produce thousands of cases and hundreds of deaths" from diseases such as scurvy and pneumonia. Cost conscious entrepreneurs left otherwise curable and preventable disease "to cut a wide swathe through the ranks of black workers."

As depicted in Table 4 mortality rate among the conscripted labourers was very high.

Table 4

Black Miners' Death Rate 1906-50: selected years

Year	Total Employed	Disease		Accident		All causes	
		Number of deaths	Death rate per 1000 p.a.	Number of deaths	Death rate per 1000 p.a.	Number of deaths	Death rate per 1000 p.a.
1906	17 381	1163	66.91	157	9.03	1320	75.94
1907	26 098	1486	56.94	102	3.91	1588	60.85
1908	30 865	1397	45.26	132	4.28	1529	49.54
1909	32 721	1383	42.27	161	4.92	1544	47.19
1910	37 826	1682	44.47	182	4.81	1864	49.29
1912	34 669	1073	30.96	163	4.70	1236	35.66
1914	36 514	897	24.57	135	3.70	1032	28.27
1916	40 749	911	22.36	172	4.22	1083	26.58
1918	32 784	3629	110.69	88	2.69	3717	113.38
1920	37 890	599	15.81	75	1.98	674	17.79
1922	36 289	681	18.77	86	2.37	767	21.14
1924	41 372	665	16.07	89	2.15	754	18.22
1926	42 047	589	14.22	91	2.16	689	16.38
1928	43 703	756	17.30	94	2.15	850	19.45
1930	45 342	687	15.15	98	2.16	785	17.31
1932	36 050	344	9.54	93	2.58	437	12.12
1934	62 339	583	9.35	142	2.28	725	11.63
1936	80 092	794	9.44	198	2.36	992	11.80
1938	87 847	906	10.31	153	1.74	1059	12.05
1940	85 760	528	6.16	121	1.41	649	7.57
1942	81 862	584	7.13	127	1.55	711	8.68
1944	75 155	567	7.55	82	1.09	649	8.64
1946	70 647	521	7.37	81	1.15	602	8.52
1948	63 391	409	6.45	71	1.12	480	7.57

| 1950 | 59 548 | 513 | 8.62 | 92 | 1.15 | 605 | 10.16 |

[Source Phimister (1988, p53) Table 2.2]

Notwithstanding the political defeat of Charter Rule by non-elite settlers, the resultant regime was predisposed to crafting its own privileges based on state paternalism and institutionalised racial discrimination. Settlers' "reign of privilege" in Zimbabwe can be contrasted to Zaibatsu dominance in pre WWII Japan. According to Bison, cited in Miwa and Ramseyer (2000), Zaibatsu families were "privileged groups [which] had exercised despotic power in every phase of economic life. Whether one looked at agriculture, labour, industry, banking, or trade, the picture was the same."

Prime Minister Godfrey Huggins, whose long 20 year reign is probably only second to that of President Mugabe, set about to implement 'Wilson's twin pyramid ideology'. The policy sought to cement once for all the dualisation of the Rhodesian society into black and white economies. A series of discriminatory policies and legislation institutionalised "colour bars" to guarantee "the 'ultra-exploitability and ultra-cheapness' of black labourers," Phimister (1988, p192). Education, training, employment and social opportunities were predetermined by one's racial category. African's long-term competitiveness was effectively curtailed. Rhodesia was deemed a white man's country. Prime Minister Huggins is on record declaring:

> The European in this country can be likened to an island of white in a sea of black, with the artisan and the tradesman forming the shores and the professional classes the highlands in the centre. Is the native to be allowed to erode away the shores and gradually attack the highlands? To permit this would mean that the leaven of civilization would be removed from the country, and the black man would inevitably revert to a barbarism worse than ever before. (Rhodesia Herald 1 April 1938, as cited in Phimister (1988, p192).

A discriminatory and improperly named 'Industrial Conciliatory Act' of 1934 excluded blacks from the definition of an employee. It was assumed "the white artisan with a century of training in his bones and the naturally indolent native with inherent slipshod methods of workmanship" (Phimister 1988, p92) could not strive for the same standard of perfection. In some cases white work-

ers' claim for superiority was no deeper than the skin: "I do not think that any-body loves the farmer because he is a farmer, or a 'brickie' because he is a 'brickie.' In these capacities they have not much claim, but as white men they have a claim for fair treatment in this county." (Ibid) The Land Apportionment Act of 1933 was glorified as the "Magna Carta" of racial segregation. Africans were destined to be scapegoats of white Rhodesians' misfortunes. During the Great Depression, the Chief Native Commissioner bragged, "the Natives took the 'shock' so effectively that our Colonial Treasurer was able to balance the Colony's revenue and expenditure...The Native ... has always been the shock-absorber – the 'snubber' – in the State motor car." See Phimister (1988, p183).

It appears the noble goal of bringing civilization to 'the dark continent' was a by-product rather than the primary goal of colonisation despite populist pretences of colonial development apologists. I am not suggesting no benefits accrued to Africa as a result of the intercourse, whether consensual or looted. One of the greatest ironies of our country lie in the fact that it is the grandchildren of ancestors who collaborated with settlers, rather than those who fought hardest for autarky, who were destined to be the new rulers. Some of the self confessed beneficiaries consciously pay homage to Rhodesia as a necessary foundation for Zimbabwe. Lupe Mushayakarara (2001)[16], a prominent and eloquent Black critic of the Zimbabwean society confessed:

> I make no apologies about colonialism because I am one of those
> Africans who see it as having been a necessary evil. I am part of a
> much bigger family of individuals sharing a common political an-
> cestor, Britain, in spite of what Mugabe may want people to be-
> lieve. I am at home throughout this entire continent [then studying
> in America] and around the world, unthinkable without the gift of
> the English language... Whether Britain raped and plundered an-
> cient Zimbabwe, the offspring of that relationship is present day
> Zimbabwe.

On the other hand exploitation of resources and other sundry causes cannot be ruled out. As demonstrated in Belgian Congo, localised asset strip-ping and exploitation often unfold in the full glare, and with the tacit consent, of the international community. Black, Kraakman and Tarassova (1999, p5) cyni-cally regret recent collusion, "The 'Washington Consensus' supported dirty pri-vatisation as better than no privatisation, and supported Russia's privatisation czar, Anatoli Chubias, as he pursued privatisation by any available means."

What then mattered was deliverance of a fatal blow to the socialist ideology by seizing "a political window of opportunity that might close if they waited"...(p26). In retrospect Black et al (1999, p6) lament: "[Staged] privatisation is not enough, it matters who the owners are."

Figure 2 below illustrates that some sections within the same community do not care about social injustices that do not directly concern them. University students, who fought sporadic battles with the police since 1988, and against a draconian University Amendment Act of 1991, were often condemned as hooligans by disinterested spectators. The Zimbabwean middle class in particular is many a time accused of political indifference. To political enemies, the middle class stand out as men and women who put themselves before their nation. To the down trodden, the local middle class reserve themselves even when the nation is in need of their exact talents. However, it has not escaped notice of the middle class that the most marginalised often swell the ranks of violent brigades unleashed against political dissent.

Figure 2   Caught short on empathy or just free riding?

[Source: *Daily News* 6 February 2001]

Poivad – a new framework

Having digested our challenging record it is my submission that lessons from both the past and the present have been the same. Though for want of vocabulary, I have recharacterised these forces under a new framework, the intention is not to provide yet another polemic interpretation if it could have been avoided. Unlike Philip Mason (1958, pv) who suggested potential academic objections to his work would be due to the "confused and complex" situation then in Central Africa, I welcome constructive criticism.

The central point I am interested in discussing is my proposition that economic organisation in Zimbabwe has generally followed a pedigree of Machiavellian Economics I have christened POIVAD, an acronym for Patronage, Ostracism, Impunity, Violence And Demise. A Machiavellian system is unscrupulous, selfish, cunning, manipulative and ruthless. This economic phenomenon prevailed under Charter Rule, Settler Colonialism and Independence. In my view, the fault does not entirely lie with successive governments, but is shared with general society, which – either too busy to realise it is doing nothing or maximizing private value – has a predisposition to free riding. As a result thinly veiled, in some cases shocking, Machiavellian designs are blessed by acclamation. Elections are triumphantly won despite bad policy, social and economic decadence.

A Poivad framework does not require any hard thought out ideology to thrive. Predominantly turning to Bartllet (1987, p1-3) for support and motivation, three basic baits of human emotion: fear, greed and envy essentially carve out "the foibles, frailties and strengths of human beings" and personal motivation. Bartlett (1987, p1-4 and 130-134) argues that leaders strive for power without responsibility; rendering power an end in itself. Society in turn "abdicates" power to those who promise security and comfort as each individual considers the question: "What is in it for me?" Kindleberger and Herrick (1977, p128) add crucial supplementary questions, "Who can protect me?" "To whom do I owe allegiance and who owes me?" The politician answers by appealing to people's self interest and deliberate divide and rule tactics: instilling fear in the hearts of his enemies; promise riches to colleagues; and destruction of common enemies

to collaborators. In moments of fear, greed and envy the majority handover power to a few without residual constraints and restraints[1].

The contract is absolute despite subsequent regrets. I suppose subsequent rationalisation is periodic rather than continuous because it is expensive not only in terms of time and productivity, but the obligation to have a reasonable collective consent. Unfortunately once power is given the installed leader is beyond control. Unlike Grossman and Hart's (1986) property rights approach to corporate governance there is no residual right of control to matters within and not specified by the incomplete contract. The process of abdicating power is often a conscious effort. For instance, students through time have helped overthrow or prop up many a regime. The regalia of power never rest upon them. A more discernable eye may find close examples of Garibaldi in Southern Africa. Bartlett argues that those who surrender power are weakened and made dependent on whoever is installed. I however note that, with hindsight society has erected formidable customs and statutes around power to rein it within the perimeters of its prenuptial promises. Although people dread change fearing the unknown young regimes are typically benevolent, hence the limit to executive terms in some democracies. Indeed there is a trade off between stability and novelty. In an environment where alternative ideas are not allowed to compete for competence, and where the rule of law is flouted with impunity, of course redress is attained at a very high opportunity cost. Contracting requires an element of trust. If contracts cannot be enforced, risk cannot be trained to those who can best manage it. Bargaining is generally not Pareto efficient. Society as a whole cannot generate the highest possible wealth out of its resources.

Power, whether competent or otherwise, - and like Xenocrates's beautiful city[17] - requires continued support of economic resources to persevere. Bartlett identifies land and people as the most important economic resources. Land is at the apex of all resources because it does not deteriorate with use. Power, like a bee's sting, ironically depreciates with use. Those who make excessive use of it are unable to pass it to their preferred heirs. "The threat is many times more

---

[1] Although democracy is traditionally defined as a "rule of the people, by the people for the people" the flow of ideas is typically top down. At rallies politicians sell their ideas by telling the audience what it wants to hear rather than harvest grass roots ideas. The smokescreen makes it possible for a few to subjugate the acquiescent many. For Bartlett (1987, p28) "Democracy remains as it is and will never approach that which it should be."

potent than the use", (p4). In my view, excessive use of power renders it arbitrary. Lord Acton's famous remark is well known: "Power tends to corrupt, and absolute power corrupts absolutely." This increases uncertainty to sections that contracted for "security" and those who bargained for "riches". Even envious collaborators are unnerved by the growing multitudes of overt enemies. Compradors held together by greed and not principle, could, when struck by 'a prisoner's dilemma', transform into turncoats. In a turbulent environment the opportunity cost for change diminishes hence absolute power cannot be maintained efficiently. As Edmund Burke (1777) observed, force can be used for both nation building and destructive purposes. See Figure 3 below that provides an appropriate contemporary illustration.

Contrarily to power, land ownership entails absolute long-term advantages and latent strength. As a result ownership of land is only relinquished as a last resort. To avert the real threat of social storms against overt concentration of ownership, land may be held under anonymous names, subordinates or other fronts. To devious opportunists, land, Bartlett (1987, p12) notes, "is a most convenient battle-cry, and an equally effective rallying call. The essence of persuasion is selfishness which is politically presented as selflessness."

"Democratic processes must remain the exclusive responsibility of the nations and peoples in whose domain they are undertaken and practised...."
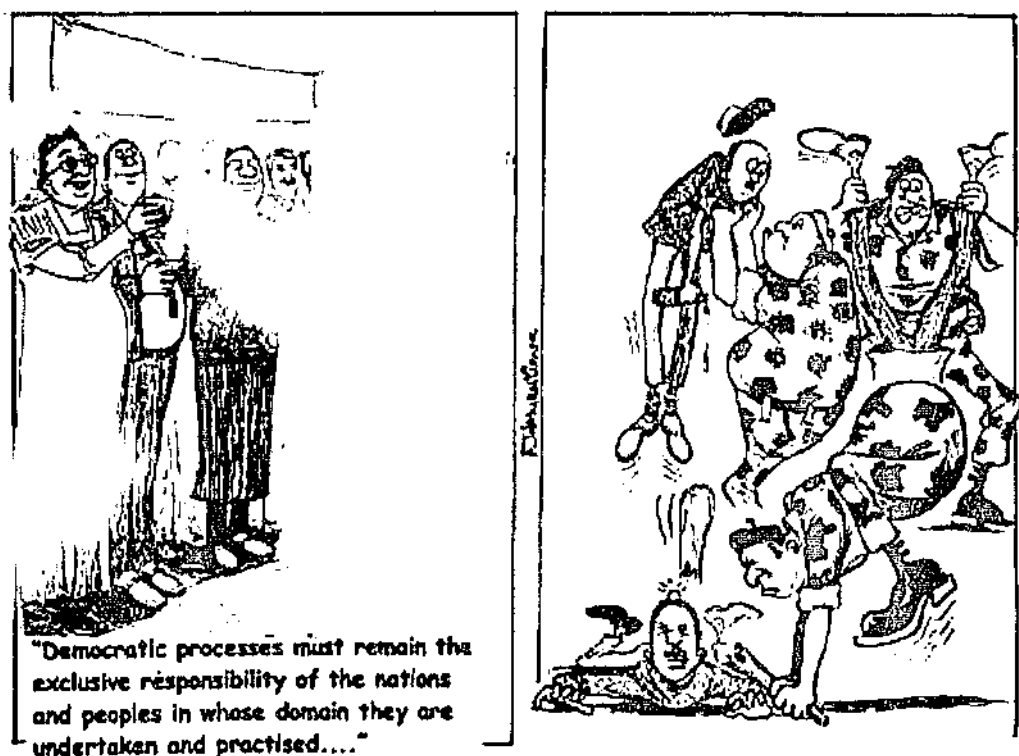
Figure 3   A cartoonist's impression of an electoral campaign

[Source: *The Daily News* 21 Feb. 2001: Details in the left panel modified]

People of sundry motives acquiescently hand over power to politicians but cannot be relied upon for its retention because their unpredictable preferences change with time. Although the state invests heavily toward the effort of reading human emotion, the leader, perhaps conscious of own chicanery, is most fearful of change. Confidence and escape hatches are not built on competence and vision, but entrenched on the status quo, glorified past success and vain personal cults. Rhodesian confidence, for instance, was founded on elitist laws of patronage and exclusion, to the extent of requiring force of arms to dismantle it. In Zimbabwe, the hallmark of ZANU PF achievements rest on the historical foundations of having prosecuted a protracted liberation struggle. To date, most parliamentarians in the ZANU PF stable are either former security details and war veterans or ex-school teachers. Meda (1999, p5) agrees the new government at independence was largely composed of war veterans who lacked proper skills to manage the economy. Apologists for ZANU PF leadership, as instanced by Mavunga (2001)[18], never miss an opportunity to repolish the party's admittedly steady-fast liberation war credentials and the then economically inevitable reconciliation.

Since independence political campaigns have effectively milked both "war phobia" and "its non-realisation" for more than its worth. During dire plebiscites the party has not hesitated to fall back on its fighting competence in order to   remain in office. See Bartlett (1987, p109) who argues, "No matter how appalling the conditions, familiarity breeds preference." In Zimbabwe *kujaira nhamo* [getting used to difficult conditions] is considered an excellent social virtue. Seen in a different light, the philosophy leaves room for stoic indifference, and according to Masipula Sithole (2001) the inculcation of 'fatalistic values." Sithole, who credits Moyo with the concept of "normalising the abnormal", suggests the framework explains general acceptance of chronic shortages of basic necessities. In 2001 Moyo, probably in a different incarnation from the 1990s since joining government, denounced the concept as a phrase, which by definition is an incomplete sentence. Empirically, it would be interesting to investigate

the extent to which adaptive expectation (i.e. learning from the past) and rational expectations hypotheses hold for Zimbabwe.

Despite very sceptical introductory and concluding remarks, the rest of Bartlett's thesis is surprisingly gullible. He has lost no love and faith in the paternalism and integrity of modern day princes, the politicians. To him, "Economics is the study of integrity", (p131) and yet "there is no morality in economics", (p104). Machiavellian economics is recast as a constructive "predeterminable pattern of behaviour in the pursuit of [man's] material gain and his self-preservation...(p3)" In contrast to his heartfelt admiration of the Japanese economic organisation he laments the lack of economic philosophy in the Britain of 1987. In his hands Machiavellian Economics simply meant British survival and prosperity depended on the nation's ability to "explore objectively and with integrity the probable alternatives open to it and then have the courage to take a series of predetermined steps, each of which is uncertain and confirmed only after commitment", (p28). Economic philosophy and policies are rendered visionary. The implied acceptance of Thomas Hobbes's anarchical "state of nature" generates internal inconsistencies and contradictions with the envisaged archetypal Hegelian nation statehood.

My point of departure is that Machiavellian Economics is more than deliberate economic vision. By definition a Machiavellian policymaker cannot have integrity. He or she does not mean what they say. In Bartlett's own words, "the democratic system is not conducive to the integrity of leadership. Democracy panders to human nature and therefore shuns, ignores or deliberately disbelieves any adverse prognostication", (p90). Under Poivad resource managers use their proximity to state and commercial resources to craft an elitist society based on patronage and self-preservation. As Black, Kraakman and Tarassova (1999) note in their powerful and sombre paper, well-connected technocrats face two strategies to maximise private wealth. The choice is between honest entrepreneurship (which success is not guaranteed) and skimming revenue already there, (if vernal the proven skills could already be under their belts.) Asset stripping; resource redistribution in favour of friends, kith and kin; and other dubious "trusteeships" are the major economic activities instead of increasing productivity. Pyotr Aven (1994), cited in Black et al (1999) depicts graphical decadence in post Soviet Russia:

> To become a millionaire in our country it is not at all necessary to have a good head or specialised knowledge. Often it is enough to have active support in the government, the parliament, local power structures and law enforcement agencies...In other words, you are appointed a millionaire.

I argue infra that *politics of patronage* has been thriving for many decades. Hellman et al (2000, p24) define patronage as the hiring of friends and relatives into official positions by public officials. Rhetoric, race, partisan affiliation, discriminatory laws and regulations systematically alienate opponents. This ostracism is deliberately cultivated and nurtured to ensure self-entrenchment. Except in very extreme cases there is usually no redress for injustice suffered by those outside the circle of patronage at the hands of the untouchables. Naked misdeeds, bias and corruption continue with impunity due to token fines, inconclusive investigations and suspect (if not suggestive) executive clemency orders. Pretences at the indispensability of the 'godsend' leader along with any dirty methods are not uncommon. The means are condoned 'in the name of national interest'. What excruciating dehumanisation has mankind suffered at the hands of fellow man professing to be just doing their jobs? Although each generation makes its own heroes, and the spirit of life is destined to eternity, resource managers often have a contemptuous view of posterity. Phimister (1988, p229) recounts that a typical myopic vision concludes, "After me, the desert." As we have noted earlier on, excessive reliance on despotic power depreciates its potency. Openly sponsored social contempt, vigilantism, anarchism and anachronistic barbarity, even by a small section of the community, increases general despondency and violence as affected communities take steps to safeguard their security and self-preservation. Black et al (1999) demonstrate that despotic tendencies by government such as unfair taxes and deliberate non-payment of bills owed to private companies "[reinforce] disrespect for rules." A Zimbabwean saying advises big baboon to earn respect. Violence, being a sword of fire, is by definition double edged. In progressive hands it has a potential to be revolutionary, purificatory and therapeutic. In the dark realms of anarchists, bandits, criminals, demons and totalitarians; condemns and executes anything not part of its vortex – good or bad – just or without cause or form. Violence during a revolution and violence under a repression are as different as chalk from cheese. If fear of "violent death" is man's worst phobia,

(Hobbes) a regime that brings fear of death to the doorstep of its citizens on a daily basis is building bridges on the Rubicon of their desire for change. It was argued above that desperate times decrease the opportunity cost for change. As in any struggle, potential for demise is inevitable though the course is unpredictable. Demise takes several forms ranging from destruction, demolition, devastation, decimation, dismemberment, downfall or death.

The Poivad premise propagated in this thesis unifies the colonial apology proposition and the underdevelopment theory into a single framework. A Poivad perspective attempts to resolve the seemingly perplexing thesis that Zimbabwe amounts to "The Terrain of Contradictory Development" perfected in Sylvester (1991). No any one way of looking our past activity can be final. Even Bartlett (1987, p64) who believes human nature does not change, agrees that changing circumstances eliminate benefits of experience and necessitate "a constant return to basic studies ..." Zimbabwe has a long history of economic oppression. Without a consolidated conceptual framework, it is difficult to appreciate fundamental forces operating beneath her economy. In my view, corporate governance and institutional structures have a significant effect on the economic and financial developments to warrant a serious study. Although a full analysis of all the issues raised in the Poivad paradigm is well beyond the scope of this thesis, the framework is a valuable springboard for further analysis.[m]

3.3 Additional Remarks and Way Froward

Zimbabwe's nationalist pride has been battered chronically by disappointing economic results. Despite our collective quest for improvement, our dreams have often gone wrong. Part of the vertigo lies in exultant incorrigibility. Society should regard with suspicion men and women who believe only their habits, persuasions and pretensions contain the truth and substance. Heightened intolerance to non-partisan views and innovation, accompanied by ribald self-righteousness to the point of autolatry (i.e. self-worship), is ironically a receipt for sectarian violence and mass poverty. Unfortunately, all regimes Zim-

---

[m] A more detailed analysis applying a POIVAD framework to the major historical developments in Zimbabwe, namely Charter Rule (1890 – 1923), Settler Government (1923 – 1953), The Federation (1953 – 1963), Unilateral Declaration of Independence [UDI] (1965 – 1980), Independence and Post Colonial Contradictions (1980 –2001) is available to serious researchers on request to giftezh@hotmail.com.

babwe has known believed that the country's destiny was only safe in their hands; to the extend of blaming everyone except themselves for their failures. Maybe it comes naturally. I have yet to meet a man who believes his wife might be better loved elsewhere. In the end, politicians sometimes put personal ascendency and superiority over others above needs of the nation. As if that was not enough Bartlett (1987, p34) argues, "He [the politician] may be wrong and the destination may not be worth the journey and that he will never know."

Dysfunctional self-interest does not guarantee economic efficiency or sustainable socio-economic transformation because the markets are not contestable in a logical way. In the year 2001 life expectancy was 40 years, unemployment above 70% and inflation around 100%. Real return on most financial and physical assets, including labour, was negative - paralysing economic activity. The chronic "inability" of several "employers" to pay positive real wages, above a basic poverty datum line, renders the employees a captive market for corporate subsidies. In spite of outrageous mark-ups on commodities such as furniture and electrical goods for instance, a lot of Zimbabwean firms still fail to make a grade in the world of business. In my view, this is a classical case of a failure of principles rather than effort on part of both government and industry.

Innovative ways must be found to give practical effect to contract enforcement, transparency, accountability, stakeholder empowerment and competition. In my view, all governments have to be held accountable for macroeconomic performance under their reign. Politicians seek and renew their mandates to govern ostensibly on that account, in the name of doing what is good to the general public. They are quick to claim all credit even for fortuitous prosperity. Management by crisis and failure to take into account predictable factors beyond one's control is an unjustifiable strategic deficiency.

Above all, Taylor (2000) emphasises that economic prosperity is within the reach of every nation provided there is will power to take the right decisions:

> There is, therefore, no 'secret' or 'holy grail' of economic development, no secret formula of growth that is applicable to a poor economy but not to a rich economy. The only secret is an open one: For growth to occur, there must be in place policies that foster the formation of [human and non-human] capital and its subsequent investment in produced means of production... [Other-

wise,] The search for a 'chemistry of growth' nevertheless remains an *ignis fatuus*, a deceptive hope.

In Zimbabwe there is an urgent need for a conscious effort to enhance the productivity of (and return on) all assets. Financial sector reform may be one way of improving overall economic performance through more efficient financial intermediation and increased competition. Improved access to financial services at all levels of society might be useful in breaking the vicious cycle of poverty in small economies such as Zimbabwe. The regulatory framework in which financial intermediaries operate is considered an important determinant of financial sophistication and economic growth.

4. THE ZIMBABWE FINANCIAL SYSTEM

Pecunia non olet: money does not stink.

Roman emperor Vespasian [on taxing public toilets] as cited in Askes (1971,16)

4.1 Evolution of the Zimbabwe Financial System

The Era of Free Banking (1892 – 1939)

Similar to the experiences of many former British Territories, the financial landscape in Zimbabwe witnessed episodes of free banking, a currency board, and a correspondent system centralised around a central bank. Free banking refers to a monetary system in which banks issue their own currency and keep their own reserves without control of a central bank. Bagehot in "Lombard Street" [as reported in Goodhart 1988] considered this to be the theoretical "natural state of banking." In a series of provocative articles, Hayek suggested that banks in a free system should be allowed to compete on the basis of the standard value of the notes they issue. Other proponents of free banking argue that central banks are too conservative. They (central banks) prevent innovation and reduce competition by a plethora of regulations. In Bagehot's view a centralised "one reserve system" makes the financial system more delicate by reducing the overall amount of reserves retained in the money market. Such a

system is much more likely to frequently draw on state help. In my view, Bagehot's most important argument is that a "one reserve system" is run by a single board of directors thereby making society "dependent on the wisdom of that one only, and cannot, as most trades, strike an average of the wisdom and folly, the discretion and indiscretion, of many competitors."[19] However, I agree with Henry Thornton (1802, p94), also cited in Goodhart (1988,p18) that a system envisaged by Bagehot will be ravaged by moral hazard as each institution pursue its own interest, levy inflation tax, at the peril of financial stability.

For a very long period of time banking operations in Zimbabwe depended on two expatriate institutions – the Standard Bank of South Africa Limited and Barclays Bank (Dominion, Colonial and Overseas). Standard [Chartered] Bank was the first bank in Zimbabwe. It was established in 1892, two years after the arrival of the Pioneer Column, at the personal request of Cecil John Rhodes. The parent Standard Bank was conceived in South Africa in 1857 and latter founded in London in 1862[20]. It had a nominal capital of £1m subdivided in £100 shares of which £500 000 was paid up by 1864. From inception the bank rapidly expanded through a policy of deliberate amalgamation with other South African based institutions. "The early policy of absorbing other banking institutions had the advantage of removing rivals but retaining goodwill, local knowledge and existing clientele," reveals Standard Bank (1967, p4). The bank expanded into Malawi (1901), Zambia (1906), Kenya (1911) and Uganda (1912). Growth of the bank in Africa was solidified by the acquisition of the Bank of West Africa in 1965 with more than 90 branches in Ghana, Nigeria and Sierra Leone. According to Newlyn and Rowan (1954, p74) the Bank of British West Africa had been established in 1884. Standard Bank merged with the United Kingdom (UK) incorporated Chartered Bank in 1969 to establish the present day Standard Chartered Bank. The Chartered Bank of India, Australia and China was incorporated in 1853 in the UK. The Zimbabwean entity is a fully owned subsidiary of Standard Chartered plc of the UK, via another subsidiary - Standard Chartered Africa Holdings BV incorporated in the Netherlands.

Banking philosophy and activities in Zimbabwe were closely linked to political developments from inception. By its own admission the Standard Bank (1967, p9) had close links with the BSAC. Its interests were indirectly "repre-

sented in the Pioneer Column by the youngest son of one of the General Manager and the eldest son of another." Rhodes's personal friendship with the then General Manger, Lewis Mitchell, facilitated establishment of operations in Zimbabwe. The BSAC offered to underwrite the bank's risk of loss from African raids in 1890. Expansion into Zimbabwe was delayed until a telegraph line reached Harare." Business was launched from the BSAC premises, shared with the entire colonial administration. The bank quickly opened branches in all major town centres in the country.

In the absence of proper banking facilities the white settlers had hitherto relied on the BSAC's cheques as the chief medium of exchange because cash was scarce. Easy credit was prevalent as cheques took almost a month to clear with the nearest facilities in Mafeking, South Africa. Figure 4 below illustrates a stamp based currency introduced by the BSAC pending establishment of banking institutions. To this day this type of currency is still a popular form of deposit documentation among rural social clubs.

The stamp currency of the Chartered Company which had been the chief medium of exchange before the introduction of the Standard Bank notes.
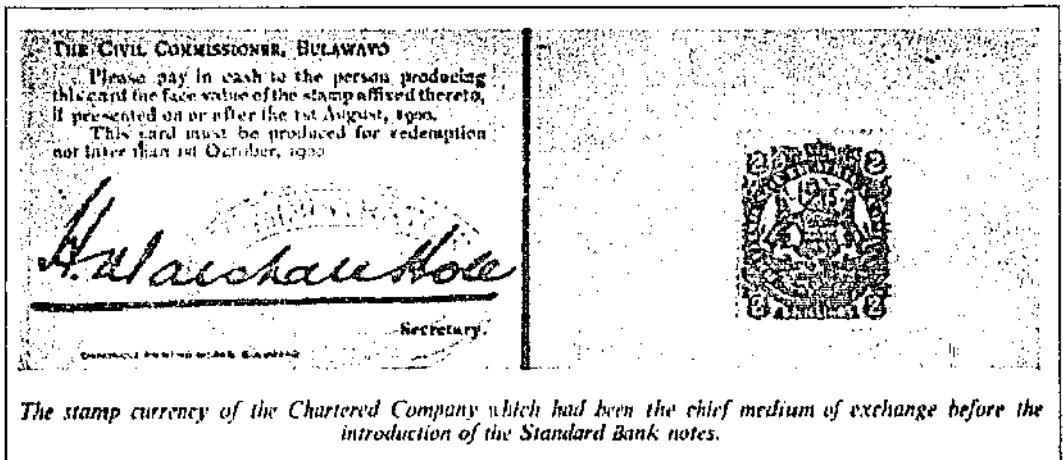
Source: Standard Chartered Bank (1967, p20) "Three Quarters of A Century..."

Figure 4   The first official currency of Zimbabwe.

" After deliberations between Rhodes and Mitchell on one Sunday morning in 1892, the telegraph line between Cape Town and Harare was cleared for an hour to enable Mitchell to consult Jameson on prospects of opening a bank in Zimbabwe. Rhodes' personal influence secured the prospective officials "priority seats" on the Chartered Company's four-passenger carriage for the 18 days' journey from then Fort Tuli to Harare, Standard Bank (1967, p11-12): "Three Quarters of a Century: of banking in Rhodesia."

A stamp based currency lacks the quality of divisibility and suffers from limited transferability. The BSAC's need for financial accommodation and the breakdown in communication lines between Rhodesia and South Africa during the First Chimurenga War of 1896 gave the Standard Bank an opportunity to print the first locally produced notes. Standard Bank ably rose to the challenge and supplied the much-needed acceptable currency, illustrated in Figure 5 below, in addition to opening local accounts. Prior to that most notes and coins were printed and minted in London. The minting of coins remained a responsibility of the Royal Mint in London. The South African branch of The Royal Mint later issued some coins, (Official Year Book 1930, p568.)[21] Barclays Bank issued additional notes when it joined the Zimbabwean market in 1912.

Barclays Bank (Dominion, Colonial and Overseas) was established in 1926 through the amalgamation of the Colonial Bank, the Anglo-Egyptian Bank, and the National Bank of South Africa. Sowelem (1967, p57) noted that the origins of Barclays Bank "can be traced to the Bank of Africa and the National Bank of South Africa which commenced operation in Southern Rhodesia [Zimbabwe] in 1895 and 1911 respectively." The amalgamation brought with it vast experience from as far a field as the West Indies, the Middle East as well as from South Africa. Newlyn and Rowan (1954, p76) observed that regional centres of the bank exercised considerable autonomy.
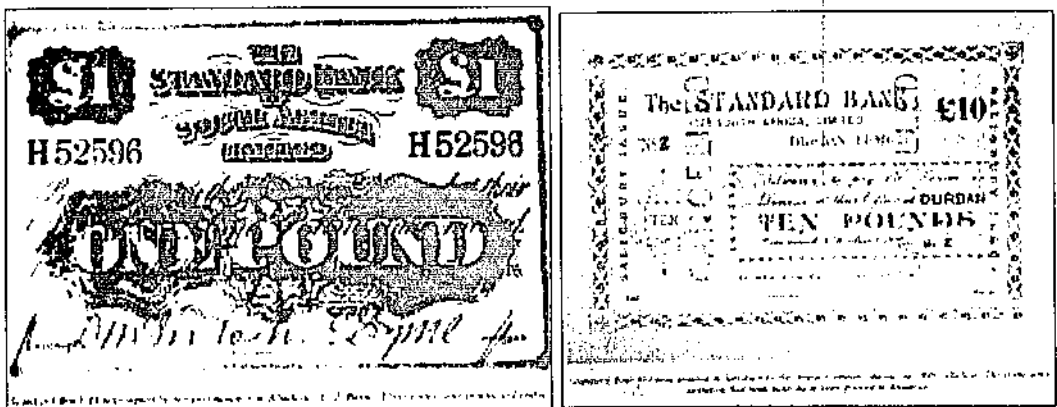
Source: Standard Chartered Bank (1967, p21) "Three Quarters of A Century..."

Figure 5   Standard Bank issued bank notes.

Notwithstanding the existence of local notes, bank notes issued in the "Cape Colony" in South Africa were recognised as legal tender in Rhodesia. In deed, prior to the passage of the Southern Rhodesia Coinage and Currency Act of 1933, British and South African coins circulated freely in the country. However, from 1933 South African coins were no longer acceptable as legal tender. British coins were unacceptable as legal tender from 1939, but remained acceptable in Zambia and Malawi even after the establishment of the Federation.

According to the Standard Bank (1967, p23) established commercial banks actively promoted the use of bank notes rather than coins that were subject to exorbitant transport costs. However, employers accustomed to paying low wages preferred to transact in coins:

> Supplying cash to the new colony was a costly undertaking. Coin was preferred to notes and gold to silver, particularly for African wages. To bring gold coin from London to Bulawayo cost 30 shillings per £ 100, and to bring silver coin from Cape Town cost £3 10s. 5d. per cent (sic). To [Harare] the corresponding expenses were £1 12s. 6d. and £4 5s. 5d.

There is inadequate documentation of the country's banking history and the respective time series data. Apart from Newlyn and Rowan (1954), Sowelem (1967), Chimombe (1983), and a series of articles by Cole in the 1970s, there is very little documentation let alone scholarly analysis of this important sector. Empirical research is constrained by lack of time series data.

From an analytical point of view, "Three Quarters of A Century: of banking in Rhodesia 1892-1967" by the Standard Chartered Bank (1967) is a graphical illustration of a wasted opportunity to document the country's banking activities. As the country's first bank, Standard Chartered Bank was in a better place to trace the course of financial evolution in the country. Unfortunately authors of the document chose to eulogize "pioneering conditions" (p51) and address a colonial audience rather than a financial clientele. For a piece done as late as 1967, it compares very unfavourably say to Herbert Frankel's (1938) "Investment in Africa" in terms of detail and authority. Although this work contains no statistical or graphical portraits of the bank's activities it found space for a "gang of [African] labourers (p37) in addition to leaving other African employees nameless in annotated staff photographs. See appendix 3. This confirms

91

that political developments had a strong influence on the local financial scene. I do not attempt to judge the bank as politically incorrect in retrospect, but argue that the subject matter of banking was not competently addressed. The indifferent attitudes criticised reinforce Theresa Chimombe's (1983) conclusion that interests of foreign owned institutions lay elsewhere. Had Standard Bank been a locally owned institution, it might have evolved into the country's central bank by virtue of its prominence and close liaison with the governments of the day[o]. The Bank of England, Banca d'Italia, Banque de France, and the Commonwealth Bank in Australia are successful examples of such a transmutation. Banque de France was founded in 1800 at the prompt of Napoleon, but was not owned by the State (Goodhart 1988, p1140).

The Southern Rhodesia Currency Board

The Coinage and Currency Act of 1938 provided for the establishment of the Southern Rhodesia Currency Board. Prior to its establishment UK coins, Southern Rhodesian coins, and bank notes issued by the Standard Bank and Barclays Bank were all recognised as legal tender in terms of the Southern Rhodesia Coinage Act of 1933. The Currency Board was tasked to ensure that profits arising from the issue of notes and coin accrued to the government. Secondly the board had a mandate to facilitate quick conversion of local currency into pound sterling at a fixed rate. It had no supervisory role in relation to other banks and non-bank financial institutions. Although it was subject to Southern Rhodesian (Zimbabwe) law, agreements were in place with Northern Rhodesia (Zambia) and Nyasaland (Malawi) for the circulation of its currency in those countries. The distribution ratio set in 1947 stipulated that profits were to be shared as Zimbabwe (10 %), Zambia (7 %) and Malawi (3 %) provided the board attained a 110% sterling cover against the currency in circulation. The chairman of the currency board doubled as a financial adviser to the government.

With effect from 1939 to March 1940 commercial bank issues ceased. However Standard Chartered Bank was retained as an agent to transact the

[o]Former bank employees found their way into cabinet positions while ex-government officials such as Sir Robert Hudson and Dr. Huggins, a former Prime Minister served on Standard Bank's Board.

board's London business presumably up to the establishment of the Central Bank. The Currency Board took over liability of the outstanding Southern Rhodesian currency and replaced it with its own by March 1942. The Sterling assets held to support the currency were also transferred to the Board. A Rhodesian pound (R£) was introduced in 1942 at the rate of 1R£ to 1£ Sterling. Its tenor expired in 1970 when the decimalised Rhodesian Dollar (R$) was introduced. Similar to the Australian currency which was decimalised on 14 February 1966 a conversion rate was 1R£ = 2R$ was adopted. The new currency only lasted 10 years from 1970 to 1979. A newly designed currency, the Zimbabwe Dollar (ZWD or Z$) was introduced at par in 1980.

During the Federation, the board was briefly renamed Central Africa Currency Board with effect from 12 March 1954. Southern Rhodesian currency remained the sole legal tender because the Federation did not issue a currency of its own. However, surplus income was now earmarked for preparations to establish a cental bank rather than for distribution.

As part of the preparations for the establishment of a central bank, the Southern Rhodesian government contracted a Bank of England official, H.C.B. Mynors, in 1948 to report on the subject. According to Sowelem (1967, p33) The Mynors report, issued in January 1949, advised against establishment of a central bank because the economy was dependent on external rather than internal problems. Existing banks were prudently managed hence required no supervisory authority. In Mynors' view, the central banking function potentially useful to the country were of a personal rather than institutional nature. To this end, Mynors recommended the appointment of a financial adviser to the government capable giving policy guidance and of maintaining close liaison with the financial sector. Sowelem (1967, p34) argues that the Mynors report placed unwarranted confidence in moral suasion and failed to consider the important role a central bank could play to foster financial deepening and economic development. With hindsight Sowelem's criticisms are justified because establishment of a central bank later enhanced the depth of the money market.

On its part, Sowelem observed that the government was craving for greater monetary autonomy from financial policies in South Africa or London. Creation of a central bank was a vehicle to put financial policy in local hands. In

fact it was realised that the Currency Board's 100 % coverage of the local currency with British securities and sterling was wasteful. The practice was blamed for the flight of liquid financial assets from the country as well as capital shortage that was perceived to be retarding general development. Establishment of a central bank provided the government with a mechanism capable of controlling undesirable expansion in bank credit, which could be inflationary. Indeed from March 1950 the Southern Rhodesian government took concrete steps toward the establishment of a central bank. Progress was only hampered by political considerations pending establishment of the Federation of Rhodesia and Nyasaland. The Bank of Rhodesia and Nyasaland commenced operations on 1 April 1956 and took over the assts and liabilities of the currency board.

The Land and Agricultural Bank

This bank had its roots in the Land Bank that was established in 1912 with a share capital of £25 000. The Land and Agricultural bank was established in 1924 to provide long-term loans for agricultural development on the security of first mortgage bonds. Operations were confined to European agricultural sectors because Africans had "no assignable title which would be acceptable for mortgage," Newlyn and Rowan (1954, p124) insist. By 1950 about 80 % of the European agricultural community had made use of the Land Bank at some time. Small loans were only extended to farmers in the African Purchase Areas from 1945. However, Sowelem (1967,p191) reiterates that less than 1 % of African farmers had title to their land hence very little credit was available to the Africans. In 1947 functions of the Land Bank were extended to cover urban housing due to the limited development of Building Societies.

The Agricultural Finance Corporation (AFC) was formed in 1971 by the merger of the Agricultural and Land Bank and the Agricultural Assistance Board. This is a public owned institution that is entirely owned and funded by government via control of the Ministry of Agriculture rather than of Finance. The AFC also had access to donor funds targeted at rural labour cooperatives through the Collective Self Finance Scheme (CSFS). Activities of the CSFS were augmented by another donor sponsored scheme known as the National Association of Savings Cooperatives and Credit Unions of Zimbabwe (NASCCUZ). The AFC is affected by inadequate capitalisation and autonomy.

After independence, government guaranteed the upsurge of loans to the small-scale agricultural sector. High volumes of delinquent facilities plagued the sector. Government, however, was slow in making good its guarantees. By June 1993, the corporation was seeking a banking licence to enable it to separate development activities from commercial ones. It was not until 1999 that the Agricultural Bank of Zimbabwe (Agribank) commenced operations as a commercial bank. Progress was slow due to inadequate capital and lack of transparency between the bank and unprofitable non-bank divisions that could jeopardise depositors. Recapitalisation of the bank via conversion of government debt into equity meant that no cash inflow would accrue to the bank. Since 2001, government was again desirous to reconvert Agribank into a Land Bank.

4.2 Architecture of The Present Financial Sector

Overall Policy Analysis

This section evaluates the structure of the Zimbabwean Financial System over time at a macroeconomic level. Disaggregated micro-level analysis such as the relative performance of individual entities, for example, is outside the scope of this thesis. The intention has not been to describe in detail the organisation and operations of the constituent units but to sketch an analytical appreciation of the main sectoral features of the financial system. The banking sector comprises of the cental bank, commercial banks, merchant banks and discount houses. Among others the main non-bank financial intermediaries operating in Zimbabwe are building societies, finance houses, the POSB, insurance companies, pension funds, micro finance, and several development institutions.

The Zimbabwean financial sector, like its real and service industries counterparts in the economy, is characterised by concentrated (local and foreign) ownership, high proportion of foreign ownership, and high degree of government control. According to Chapman (1992) the government controlled about a third of total financial assets through the Zimbabwe Financial Holding Limited (Finhold) Group, Commercial Bank of Zimbabwe, and the People's Own [ex-Post Office] Savings Bank (POSB). Foreign direct ownership accounted for at least 28% of total deposit taking institutions. In 1992 for instance, all privately

owned commercial banks, including the largest – Standard Chartered Bank and Barclays Bank were foreign owned. Since then the number of locally owned commercial banks has increased significantly. Chapman also emphasised that Old Mutual, the largest insurance and pension fund manager in the country, had a 12% controlling interest in deposit taking institutions. Old Mutual had substantial ownership in the Merchant Bank of Central Africa (MBCA); CABS – the largest building society; and in FMB – acronym for First Merchant Bank.

Most deposit taking institutions in Zimbabwe are still mesmerised by the big bank concept hence the sector is prone to aggressive mergers and takeovers. In an economy where business success often depends on connections, vertical integration is also motivated by the need to create loyal entities across the entire financial spectrum. In 2000 there were 35 banks in Zimbabwe with no less than 10 banking groups. In the 1990s bank holding companies were exempted from the 25 % prudential limit on equity subscription to a financial institution's shares by a single investor. This provision prevented dilution of ownership in influential government and foreign owned financial institutions, and many players quickly exploited the loophole to carve closely held financial empires.

By world standards Zimbabwe's financial system is underdeveloped. Demirgüç-Kunt, and Levine (1999, p3) propose that a country's financial system should be regarded as underdeveloped if its ratios for bank and market development are <u>both</u> below median values approximated for the global financial system. Table 1 shows that Zimbabwe does not pass the test. Nevertheless Zimbabwe's financial system is usually regarded as relatively sophisticated for an economy of its size. The Reserve Bank of Zimbabwe (RBZ) (1980, p9)[22] attributes this to the designation of Harare as the financial centre of the Federation of Rhodesia and Nyasaland between 1953 to 1963; strict exchange controls; and restricted access to international money and capital markets between 1965 and 1980. The country crafted a sophisticated payments system and a respectable spread of institutions to facilitate the mobilization of savings, promote economic growth, and financing of the budget deficit via domestic borrowing.

Banks and government accommodate each other's needs. Successive governments have tolerated some sort of *laissez-faire* banking practices as long as banks gave practical effect to government controls and directives even at the

expense of sound financial intermediation. On their part, banks accommodated government policies and controls as long as concentration of ownership was not diluted; and the regulatory burden could be passed on to clients in the form of guaranteed margins and a limited range of service. As Harvey (1996, p2) puts it, "the system lacked effective competition, and had many of the negative characteristics of oligopoly." Financial innovations such as automated teller machines (ATMs), telephone banking and derivatives took a very long time before being adopted into the country. In other words both government and financial institutions guaranteed their interests at the expense of the customer. Positive real interest rates are elusive in the Zimbabwean financial sector. However, neither government nor banks worry about the persistence of financial repression as both can get income to the detriment of weak clients who have no recourse.

Very few changes were made to the financial sector after independence. In spite of ZANU PF's socialist rhetoric the Companies Act did not forbid 100% foreign owned subsidiaries. However, in practice no new 100% foreign owned banks were tolerated as government policy required new entrants to have at least 30% local shareholding. According to Harvey (1996, p1) "two American banks closed their representative offices in Zimbabwe in 1983 and 1984, having failed to get full banking licences." Officially, government at the time attached great importance to local ownership of economic resources. For instance, the Insurance Act of 1987 required at least 51% of the institutions to be localised. The Act paved the way for a localisation programme pursued from 1988 to 1994. In fact Exchange Control (E/C) spearheaded the localisation of foreign owned institutions in order to stamp out capital flight. Apart from the registration of subsidiaries of foreign owned banks as Zimbabwean versions, and the floatation of 34% of Barclays Bank's share capital on the Zimbabwe Stock Exchange, not much localisation emerged in the banking sector. In deed there was little cooperation between E/C and Banking Supervision departments of the Reserve Bank because the then powerful E/C department had no intentions to disclose its criteria. Fears of widespread nationalism proved unfound. Contrary to Chapman, Harvey (1996, p6) characterised the increased ownership of financial assets by government as "incidental nationalisation" driven by external events rather than conscious policy. This conclusion is valid because the purchase of

the 62% equity in Rhobank, now Zimbank under Finhold, was precipitated by the intention of South African based investors - Nedbank to withdraw from the market. Similarly, the Commercial Bank of Zimbabwe (CBZ), now trading as the Jewel Bank, was localised after the worldwide collapse of BCCI in 1991. In contrast, no localisation occurred when the Standard Bank of South Africa bought ANZ Grindlays in 1991 and branded it as Stanbic Bank.

In my view, there has been inadequate attention to financial reform in Zimbabwe. Notwithstanding the widespread agreement in financial literature regarding the causal effect of financial intermediation on economic growth, the financial sector formed a little part of government economic policy after independence. Government might have misunderstood the cardinal role of financial intermediation in economic development. In contrast to elaborate discourse on education, rural and agricultural development, there were only two paragraphs on money and finance in the Growth With Equity economic policy statement of 1981 (p3). The proposal to create a "Commission" to examine "the whole monetary and financial sector" has never been followed by the Wallis (1997) or Campbell (1981) type of inquiries, as held in Australia. Harvey (1996, p5) observes that in both 1982 and 1983 the Government of Zimbabwe proposed but failed to implement a Money and Finance Commission. By 1986 financial sector reform was no longer part of the government' development agenda. Apart from secretive IMF and World Bank analytical expeditions, financial sector reform was not given priority. Prospects for far reaching financial sector reforms were only rekindled in 1991 prior to the launch of the Economic Structural Adjustment Programme (ESAP). Rattsø and Torvik (1998, p326) highlight that a team of UNDP-funded Australian experts secretly studied possible targets for trade reform for two years before the programme was announced in July 1990. The Canberra based Centre for International Economics was, in ten weeks, tasked to identify impediments to efficient intermediation and opportunities for financial sector reform. Among other constructive recommendations not adopted was the proposal to abolish rigid market segmentation in the financial sector.

Harvey (1996, p3, and 6-9) advances five plausible reasons for limited banking reform after independence: The financial system was considered extensively developed to warrant any material reform. Intervention in banking was curtailed to protect interests of the white business community on whose confi-

dence the economy rested after generations of discrimination against black advancement. Government had also learnt about the cost of inappropriate intervention from neighbouring countries such as Zambia and Mozambique. Widespread nationalisation ran the risk of provoking direct South African military intervention. A highly developed system of stringent controls inherited from the UDI era provided government with "de facto control over the allocation of credit." In Harvey's own words, "Direct credit control was therefore unnecessary; exchange controls provided the government with effective control over most of the economy, for the purposes of both economic management and political control." Although Harvey considers the last point as the most important one, the paper fails to explain why exchange controls were used to support the status quo rather than restructure the economy to correct the perceived colonial imbalances.

In the final analysis, in my view, only four hypotheses stand. Firstly, it is possible that the financial system was considered well developed, and had accumulated reputable expertise to warrant any intervention despite much talk about colonial underdevelopment. Secondly, the allegations that "government's political and administrative powers were widely used to divert resources," to prominent individuals who deliberately avoided repayment (as in Harvey, p11-12), implies that true reform might have been sacrificed for self-enrichment. Thirdly, there were a lot of specialist institutions and funds ostensibly targeted at the Small and Medium-scale enterprises SMEs) for poverty alleviation and economic development. Such special vehicle conduits for financial resources may have invalidated the need for radical reform to ensure efficient financial intermediation. Lastly, and perhaps most importantly, the belated proliferation of indigenously owned banking institutions could have been considered the most appropriate organic remedy for financial and economic transformation. The financial sector remained relatively the same from 1960 to 1980. There were 2 to 4 accepting houses, 5 commercial banks, 2 discount houses, 8 to 5 financial institutions and 8 to 3 building societies. According to Mataruka (1999, p69),

> Between 1990 and January 1999 the industry witnessed the entry
> of 3 commercial banks, 6 merchant banks, one finance company,
> 5 venture capital companies, 56 foreign bureaux, 51 money lend-
> ers, 8 stockbroking firms and 9 unit trusts.

99

However this does not explain why no local commercial banks emerged between 1980 and 1996. Even under UDI no settler owned commercial banks were registered. Incidentally there were considerable barriers to entry in the form of a conservative licensing policy and high minimum start up capital requirements for commercial banks – set at Z$0.5m in 1965, and Z$15.0m in 1995. Harvey (1996, p22), citing unconfirmed rumours, suggests that after independence some prospective African bankers failed to meet the set criteria, while white and Asian investors felt that government would not favourably consider their applications. Government might have realised that the licensing of incompetent deposit taking institutions at a time when the regulatory environment was weak could have made the situation worse. The persistence of financial repression, characterised by negative rates of return on deposits, is exogenously determined sociopolitically, and by the government's appetite for funds.

The Reserve Bank

Friedman (1959, pp6-7), as cited in Goodhart (1988, p2) argued that a Central Bank is not essential to enforce reserve requirements, but it remains vital "in order to enforce that sanctity of contract, the prevention of fraud, and the effective working of the monetary system, in a world in which information is costly and scarce." Core functions of the central bank may be divided into monetary and supervisory activities. For Goodhart (1988, p7) the monetary (macroeconomic) policy functions play second fiddle "supervisory" functions such as managing the payment system, market liquidity and soundness of the financial system. In my view, the debate amounts to splitting hairs as some open market operations cut across the both functions. Solvency and monetary policy are not mutually exclusive. Moreover the relative importance of monetary tools and targets change over time. The reassignment of prudential supervision functions to the Australian Prudential Regulation Authority (APRA), away from the Reserve Bank Australian (RBA), proves supervisory functions need not be necessarily housed in a central bank despite their close connection with monetary policy. What is undisputed is the conclusion that the micro functions of a Central Bank cannot be competently provided by a competing commercial bank due to conflict of interest.

The Reserve Bank of Zimbabwe (RBZ) was established during the Federation of Rhodesia and Nyasaland in 1956 under different names. It is at the centre of the Zimbabwe Financial System. Sowelem (1967, p47) shows that since inception the Reserve Bank was not restricted from engaging in ordinary banking activities. No retail banking activities were ever undertaken. Governance of the bank and some of its core functions have changed very little over the years. From the time of its establishment government held the bank's entire share capital. In contrast, the paid up share capital of the South African Reserve Bank is entirely held by the private sector.[p] The Reserve Bank of Zimbabwe's prescribed capital of Z$2m and a general reserve fund of Z$6m has also remained static through time despite chronic increases in inflation. Admittedly the Reserve bank is authorised to hold special reserves and other investments.

Broadly speaking, the Reserve Bank of Zimbabwe (RBZ) has multifarious functions. The most important functions, as enumerated in section 6 of the Reserve Bank Act 1999 [Chapter 22:15], include regulation of the monetary system; maintenance of currency stability; supervision of banking institutions, foster financial stability; manage the payment system; banker, financial adviser and fiscal agent of the state; formulation and execution of monetary policy; and advancement of economic policies of government. The Reserve Bank manages the issuance of notes and coins and the clearinghouse. It maintains statutory reserves and clearing balances for other banks. As banker and financial adviser to the government, the bank also acts as the government' agent in the weekly issue of tenders. Since 1957 the bank has been responsible for administering the country's exchange control regulations on behalf of government. The precise date on which exchange controls (E/C) were first introduced in Zimbabwe is not very clear. What is certain is that E/C was extended to cover the "Sterling Area" on 23 February 1961 to curb capital flight pending the dissolution of the Federation. Contrary to general perception, exchange controls were perfected rather than introduced during UDI. However, the common monetary system of the Federation was dismantled in 1964, resulting in the creation of central banks of Rhodesia, Zambia and Malawi. As noted earlier some functions of the bank remained stable over the years despite the Reserve Bank Act of 1964.

---

[p] However each individual shareholder can only hold up to 0.5% of the bank's share capital. The South African Reserve Bank cannot pay a dividend greater than 10% per annum on its nominal share capital.

Under the current law the bank's ability to lend to government is limited at a given time to a statutory maximum of 20% of the previous year's ordinary revenue of the government. Ordinary revenue excludes funds raised through loans and sundry forms of financial assistance. Advances to government (and statutory bodies) are required by law to be denominated in Zimbabwean currency and convertible into bearer securities if not repaid within 12 months from the end of the financial year (or from date of issue in case of statutory bodies). Conversion of facilities into government marketable securities potentially enables the central bank to sell the bills on the market and keep government borrowing within the statutory limit of 20%. In the past a cap was also placed on purchases of government securities by the bank. The Reserve Bank could not invest more than 20% of its liabilities to the public (including the bank's capital and general reserves) in government securities with maturities larger than six months. This provision is not part of the current Reserve Bank Act [Ch. 22:15].

There are a number of loopholes that could be used to evade the ceiling on advances to the state. Pursuant to monetary policy objectives of the nation, section 7 (3) (a) of the Reserve Bank Act [Chapter 22:15] empowers the bank to buy and sell government securities "on its own account" in excess of the statutory limit. As banker to the government, the Reserve Bank is required by government under section 8, subsection (2) of the Act to facilitate transactions on such terms as the government may determine. In addition section 39 (5) authorises the Minister of Finance to prohibit the publication of the bank's statutory returns to the Treasury "if, in his opinion, it is in the public interest that they be suspended." The suspension can be indefinite. For instance, there were no official publications from the Reserve Bank throughout UDI from 1965 to 1980.

Prior to UDI the Reserve Bank was by law required to maintain 25% of its liabilities to the public in form of gold, sterling or other foreign assets convertible into gold and sterling. In practice, the central bank initially dealt only in sterling, leaving the commercial banks to source other currencies on the London market. The sterling link was de-emphasised under UDI. Under the current Reserve Bank Act, section 33 (1), statutory reserves consist of gold and other foreign assets convertible into gold. Section 33 (2) sets the minimum threshold at 40% of the bank's foreign liabilities. However, in section 49, there is no spe-

cific benchmark for international reserves defined therein. Under section 49, subsection (2) the bank has wide discretion to determine and maintain international reserves at levels it considers appropriate for the proper conduct of the country's monetary and exchange rate policies.

Before the 1956 Banking Act there was no specific legislation regulating banking activities. To its credit, the Mynors report (1949) raised the possibility of conducting on-site banking supervision to mentor inexperienced and incapable entrants into the banking system. The Mynors report also recommended a system of licensing banks to ensure that new entrants are adequately capitalised and managed prudently. In my view, Mynors' emphasis on the "personal" functions ahead of the "institutional" activities of a central bank indirectly contributed to the subsequent emergence of two supervisory authorities to oversee the banking sector. Bank licensing was introduced in 1956 but was restricted to new entrants to the financial system. The Ministry of Finance was the licensing authority. The 1959 Banking Act provided for the appointment of the Registrar of Banks and Financial Institutions (now Registrar of Banking Institutions) under the Ministry of Finance empowered to license and de-license banks. According to Sowelem (1967, p52) the Registrar had authority to appoint inspectors to investigate any registered institution. However, supervisory objectives and responsibilities were not clearly spelt out. In the end the supervisory capacity was not developed. The Banking Supervision function was only introduced in 1985 at the Reserve Bank. Progress on establishing the relevant legislation was slow. There was considerable debate regarding the demarcation of the powers of Banking Supervision Department and the Reserve Bank on one hand, and the Registrar of Banking Institutions and the Ministry of Finance on the other. Much debate centred on the need for central bank independence, and harmonisation of the functions of bank licensing and supervision in line with international trends. The Reserve Bank considered the ability to withdraw a license a useful supervisory tool. Until August 2000 the law did not support the prudential supervisory function of the Reserve Bank. From 1985 to 2000 Banking Supervision relied on prudential guidelines and moral suasion to promote prudent risk taking within the financial sector.

As early as 1959 the central bank was granted authority to request information and issue directives under the 1959 Banking Act. All banks were ex-

pected to submit regular returns on prescribed forms. Section 59 of the Reserve Bank Act [Chapter 22:15], authorises the Reserve Bank to "establish and maintain an information network" for the benefit of banking institutions. However, time series data is not fully developed and automated. Theoretically, duplication of effort between the office of the Registrar and Banking Supervision cannot be ruled out. In practice there is constructive cooperation between the Reserve Bank, and the Registrar and Minister of Finance. The Reserve Bank and the Registrar are required in terms of Section 78 of the Banking Act 2000 [Chapter 24:20] to report on activities of banks and financial institutions at the end of each calendar year. The Minister of Finance tables the respective reports before Parliament. A more transparent arrangement would have been to make the Governor of the Reserve Bank answerable to Parliament.

Under the Banking Act of 1959 four distinct institutions of banking business were recognised, namely commercial banks, accepting houses, discount houses and financial institutions. Some institutions already in operation were immediately registered in their respective categorises. These archaic distinctions were retained in the Banking Act of 2000 [Chapter 24:20]. The playing field is not level. Building societies for instance, have legal constraints on the interest they can pay on deposit or charge for mortgage bonds. As a result the mortgage business has been abandoned in favour of money market investments. In 2000 the capital adequacy ratio of building societies was on average 108% against a regulatory minimum of 10%. That year also saw the conversion of three merchant banks into commercial banks in order to have access to cheap funding in the form of retail deposits, which were not accessible to acceptance houses, that is merchant banks.

Although the Reserve Bank has discharged its responsibilities with due diligence, its institutional structures are not appropriate for proper corporate governance. On a positive note, section 21 (1) of the Reserve Bank Act stipulates that the board is responsible "for formulating the policy of the Bank's administration and operations." Section 19 (1) renders the Governor responsible "for the day to day management, control, administration, operation and direction of the bank." Section 25 of the new Reserve Bank Act even requires the Governors and directors to disclose their interest and assets, as well as those of their spouses, to the state President. The Governors serve a maximum of two five-

year terms in office although a Deputy Governor remains eligible for election as a Governor. Members of Parliament and officers, directors or employees of banking institutions are not eligible to simultaneously hold office as directors or Governors of RBZ. In section 22 (2) the term of directors was extended to four years from 2 years, to ensure stability of decision-making. The board approves all loans and advances by the Reserve Bank to the government and the discounting of financial instruments with more than three months to maturity at the time of their acquisition by the Reserve Bank.

However, in practice there is no clear-cut division of responsibilities between the board and management. Under section 27 (1) of the Act, the Governor of the Reserve Bank is the chairman of the board. In contrast, under section 18 (3) of the Banking Act [Chapter 24:20] an executive officer of a banking institution cannot be chairman of the institution's board. The Governor and two Deputy Governors of the Reserve Bank are appointed by the state President and automatically sit on the board. Since by law, Reserve Bank Act (21) (2) the board cannot have more than seven members, and pursuant to section 26 (i) that specifies a quorum of four, only one non-executive director is required to pass crucial decisions at a meeting where all the Governors are present. Section 28 (3) grants the presiding official a casting vote in the event of equal deliberative votes. Under section 30 of the Reserve Bank Act no decision can be set aside solely on the basis of the technical irregularity of the quorum. In contrast, the Banking Act prohibits the executive directors of any banking institution from forming a majority of any board quorum. Under the current arrangements [section 36 (1)] the Minister appoints the External Auditors for the Reserve Bank and is responsible for the publication of the bank's statutory returns in the Government Gazette. Unlike in the past, the new Reserve Bank Act does not specifically exclude employees and officers of government from serving as directors or Governors of the Reserve Bank. The provision was enshrined in the previous Reserve Bank Acts to ensure the independence of central bank advice to the state. In brief, authorities have set strict corporate governance articles in the Banking Act compelling banking institutions to adopt standards that are not followed up in the law governing the operations of the central bank. In other words the authorities lay rules for others that they are not prepared to follow. Ideally, the board and Governors of the Reserve Bank should be answerable to a

statutory parliamentary committee. Otherwise the Reserve Bank is potentially vulnerable to Machiavellian Economics.

Nearer to Zimbabwe, control of the South African Reserve Bank (SARB) for instance, is vested in a 14-member board, seven of whom are elected by the state President and the remainder by the bank's shareholders. There are only four executive members of the board; the Governor and the three Deputy Governors, who constituted the Monetary Policy Sub-committee of the board. The SARB is a relatively independent central bank answerable to its shareholders for internal governance and to Parliament for monetary policy.

The ability of the Reserve Bank of Zimbabwe (RBZ) to discharge its multiple functions is compromised by want of autonomy and lack of specific mandates. RBZ is expected to maintain the value of the Zimbabwe dollar. Implicitly, this encompasses the internal value (price stability) and the external value (exchange rate stability) of the local currency. Having said this, there are no clear targets for price stability and no one is held accountable for any eventuality. There is neither a definition of what constitutes price stability nor a firm commitment to low inflation, which economic theory suggest is good for macroeconomic planning. Whereas role ambiguity might have the virtue of flexibility, it has the potential to suffer from the vice of impunity. In the 1990s, a number of countries beginning with New Zealand followed by Canada, UK, Australia, Finland, Spain and the US adopted clear inflation targets. Clear objectives foster good corporate governance via enhanced transparency and accountability. Meyer (2001, p8) argues that transparency is good for monetary policy because it helps anchor market expectations. On the other hand accountability supports the cause for central bank independence.

Meyer (2001, p4) argues that it is generally agreed that objectives of monetary policy depend on the structure of the economy and the preferences of its citizenry. RBZ is responsible for formulation and execution of Zimbabwe's monetary policy as stipulated in section 6 (f) of the Reserve Bank Act. There are no statutory prescriptions except that, by section 46, a monetary policy statement is required in June and December of each year giving "reasons" for the policy to be followed, "principles" for its implementation, and an "evaluation" of the previous policy. However, in terms of section 45 of the Act, policy is formu-

lated and implemented "in consultation" with the Minister of Finance, which implies the need for agreement. There is nothing patently wrong with that except the lack of clear policy goals and the degree of subordination. In fact most countries including the UK and Canada provide for consultation between the central bank and the Ministry of Finance. Although RBZ is required to generate independent advice it is ultimately subordinate to government, the sovereign authority and representative of the people. However, in South Africa SARB has full responsibility for implementation of monetary policy. In addition SARB has a clear mandate, enshrined in the constitution, to maintain the value of the currency. Under the current arrangements some of the Reserve Bank's functions are residual powers, which the bank can only exercise subject to the approval of the Minister of Finance, rather than statutory obligations.

Contrary to public perception, in Zimbabwe as in South Africa for that matter, the exchange rate policy is a responsibility of the government, implemented by the central bank on behalf of the Minister of Finance. Zimbabwean exchange rate policy alternates between a fixed regime and a managed system. The currency was linked to the pound sterling from 1942 to October 1972 at which time a new gold parity standard was adopted. The managed exchange rate system was typically based on a currency basket. Ramsay (1976, p 170) strongly suggests that a currency basket was first introduced in Zimbabwe in December 1971. From 1975 to 1980 the country operated a dual exchange rate system under which the currency was fixed against the South African Rand but a trade weighted basket was used to determine the floating rate against all other major currencies on a daily basis. The Zimbabwe currency was floated briefly following the introduction of the IMF sponsored Economic Structural Adjustment Programme in 1995 until it crushed 75% on 14 November 1997. Since 2000 the currency has been fixed against the US dollar giving rise to unprecedented black market trading and a high degree of unofficial dollarization.

Incidentally successive regimes in Zimbabwe have resisted pressure to devalue the currency in fear of high prices. In my view the elasticity pessimism is well found given the nature of Zimbabwe's exports and her high affinity to imports. Increase in exports a precondition for development. The Reserve Bank (1982, p13 Vol. 1) suggested economic fortunes between 1975 and 1982 mir-

107

rored the BOP position. I agree with Girdlestone (1973, p90) that, "Devaluation is highly likely to be inflationary not because devaluation is ipso facto inflationary, but because an inflationary situation already exists with absorption higher than domestic output." Technically the Marshall-Lerner condition is not met. In my view fixing the currency is however not the best remedy. Imaginative structural reforms are required in the long run. For now there is need for a proper use of the currency basket and to correct the macroeconomic fundamentals.

In Ramsay's view, it is conventional for a currency basket to refer to the balance of payments on current account in order to determine an effective exchange rate. However, an exchange rate targeted on the domestic price stability, which according to Ramsay was the case in Rhodesia, will be based on import weights alone. In practice, both import and export weights of the currency basket relevant to the bank are used to determine the rate of exchange on a key currency. The other rates are calculated from the cross rates in an influential exchange market. The Reserve bank of Zimbabwe does not divulge the relative weights in the trade basket, hence they are not known to outsiders.

Profits accruing to the bank as a result of gold and foreign exchange operations are transferable to the government's Consolidated Revenue Fund. Similarly, any exchange losses suffered on the currency are borne by government. This said, section 34 (4) of the Act specifies that the government's Comptroller and Auditor General must certify the amount of profit or loss. It is not clear how this requirement will be fulfilled because in the past external audits at the Reserve Bank were conducted by private sector practitioners.

The Reserve Bank conducts lender of last resort functions (as in section 11), for liquidity support and/or pursuant to national interests, subject to ministerial approval. Government is not obliged to support the central bank should the bank find itself with inadequate resources. Notwithstanding the statutory obligations to consult the Minister, section 34 (3) renders the Reserve Bank entirely liable for any losses suffered in pursuit of price stability and soundness of the financial system. Whereas the Registrar is responsible for granting and cancelling bank licences (albeit in consultation with the Banking Supervision), section 34 (3) of the Reserve Bank Act holds the Reserve Bank liable for any losses incurred toward the promotion of a stable financial system. In 1995 the Reserve

Bank took upon itself the controversial goal of maximising contribution to the Consolidated Revenue Fund through cost effectiveness. The resultant restructuring exercises coincided with high staff turnover in key departments.

Given the extensive poverty in Zimbabwe, it is surprising that there are no references to economic prosperity and welfare of the Zimbabwean people in the Reserve Bank Act. Meyer (2001, p5), following Milton Friedman, acknowledges that economic theory suggests that monetary policy "cannot affect the level of output in the long run," yet research supports the argument that monetary policy may be influential for output stabilisation. Meyer reiterates that the notion of "self–equilibrating forces" in the long run may be misleading because monetary policy affects both price stability and the variability of output from the economy's full potential. Indeed, "policy is made in the short run, not the long run." I agree with the conclusion that the central bank should be held accountable for price stability but government is accountable for macroeconomic performance, which it can influence through taxation, government expenditure and structural reforms. However, a central bank can foster sustainable economic growth and price stability by adopting appropriate financial policies.

Discount Houses

Discount houses played a crucial role in the development of a flourishing secondary market for a wide range of assets. The Zimbabwe money market predates UDI. Its depth was enhanced by the following the establishment of two discount houses: The Discount Company of Rhodesia (now DCZ) and the British and Rhodesian Discount House Limited (BARD) in March and August 1959 respectively. Establishment of discount houses facilitated management of the monetary system by the central bank. Emergence of a local money market curtailed the remittance of local financial resources to other financial centres such as London as was the case at the time of the Currency Board. The emergence of a local money market is also expected to enhance liquidity of financial institutions as well as the marketability of government securities.

Although the discount houses were modelled along South African and British models there were some important variations. Unlike the practice then in London in the 1950s, formal links between discount houses and commercial

banks were tolerated to stem out dysfunctional conflict. In deed the commercial banks were an important source of surplus funds for the money market. In South Africa discount houses were allowed to compete with banks for deposits, but in Zimbabwe head on competition was avoided because discount houses thrived on the goodwill of banks. Similarly merchant banks were not expected to compete with banks for retail deposits. The central bank also issued a list of authorised institutions from which discount houses were "allowed to accept offers of call money directly," Sowelem (1967, 100). From 1960 there was close cooperation between the two discount houses on the weekly Treasury Bills tender. As the discount houses were under no obligation to take the whole lot on offer, the agreement covered the price but not the volume of paper. Cooperation between the discount houses did not imply total monopoly because the central bank had an option to bid for the Treasury Bills in its own right.

The core function of discount houses is acceptance of call money from commercial banks, acceptance houses and other financial and non financial institutions for investment in short dated instruments such as Treasury Bills (TB), Banker's Acceptances (BAs), Negotiable Certificates of Deposits (NCDs), government and local authority stocks. Prior to 1998, discount houses provided the main link between the Reserve Bank and other financial institutions. Discount houses had had access to the Reserve Bank discount window and the later institution acted as a lender of last resort. There were no reserve requirements for discount houses because the bulk of their assets are highly liquid and most of their liabilities relate to inter-bank transactions. In September 1998, the Reserve Bank of Zimbabwe classified commercial and merchant banks as primary dealers that could access the Treasury Bills market directly rather than through the discount houses. This move was motivated by a desire to increase competition among the primary dealers in Treasury Bills.

Merchant Banks

Accepting Houses, popularly known as Merchant Banks, also played a significant role in the development of the Zimbabwe money market. They are modelled along the British System. The first two acceptance houses, namely the Merchant Bank of Central Africa and the Rhodesian Acceptances were founded hot on the hills of the central bank in 1956.

In contrast with early money market flops witnessed in South Africa (1923), Australia (1936), and New Zealand the Zimbabwean money market arose in a safe environment. Ironically, the National Finance Corporation established by Act of Parliament in South Africa in 1949, later demonstrated the viability of money market operations subsequent to earlier flops in that country. Private entities, beginning with Union Acceptances founded in 1955, were later able to replicate the practice. Successful South African ventures played a significant part in establishing money market institutions in Zimbabwe. The local money market also had sufficient surplus funds and short-term paper to sustain the market. Last but not least, the central bank was anxious to see the market prosper, hence the provision of lender of last resort facilities.

The merchant banks sector has low entry barriers relative to commercial banking. Merchant banks deal with discerning clients who require limited regulatory protection. In the late 1990s merchant banks and discount houses recorded the greatest number of new entrants to the banking sector. In aggregate indigenous merchant banks have been successful beyond the expectations of most sceptics. Some of the most successful merchant banks, namely National Merchant Bank, Trust Merchant Bank, and Kingdom Merchant Bank have since converted into commercial banks to tap retail deposits. However two of the early entrants into the merchant banking business – United Merchant Bank (UMB) and Universal Merchant Bank (Unibank) – have since failed due to poor management, high volume of non-performing loans and fraud. Mataruka (1999, p5) observed that the Reserve Bank provided $2.311 billion liquidity support to new financial institutions following the collapse of Boka's United Merchant bank.

Commercial Banks

From 1892 until the 1950s only two commercial banks, Standard Bank and Barclays Bank comprised the entire banking sector in Zimbabwe. Government kept substantial balances with the commercial banks because there was no central bank. The only real competitor for deposits before 1950 was the Post Office Savings Bank (POSB) now known as the People's Own Savings Bank but retaining an identical abbreviation. Financial sophistication really began in the 1950s. The Netherlands Bank of South Africa (Nedbank) commenced operations in 1951 with two branches. The National and Grindlays Bank soon fol-

lowed it in October 1953. A few years latter, the Ottoman Bank was established in August 1958. Up to 1963, Standard Chartered and Barclays Bank between them still accounted for 90% of total deposits and 85% of loans and advances. Interbank price competition was curtailed by "the existence of a detailed Banking Agreement regulating the various bank charges," Sowelem (1967, p63) insists. Cole (1974, pC3) confirms that price competition among commercial banks was eliminated by a formal agreement known as the "Register of Cooperation" under which the banks operated as a cartel in fixing service tariffs, the deposit and lending interest rates.

Cole argues (1974, p64) that the practice enabled banks to pay artificially low interest rates to "small depositors with insufficient knowledge of the market or insufficient funds to go elsewhere." In other words banks enjoyed undeserved profits at the expense of small depositors. Needless for me to say there was no room for redress. Newlyn and Rowan (1954, p245) observed that the " laissez-faire" banking policy has never subject of any official investigation report. The Register of Cooperation lasted well into the 1990s until it was decimated by financial liberalisation, which enabled new players to enter the lucrative market. Economic theory suggests that reduced competition and concentrated ownership results in misallocation of resources.

Mergers and acquisitions also reduced the number of competitors on the market. The National and Grindlays Bank acquired the Ottoman Bank in 1969 following a worldwide takeover. The bank also absorbed the Manica Board of Executors in 1971 to establish Grindlays International Finance. Years later, the Grindlays group became subject of a regional takeover by the Standard Bank of South Africa. Since 1991 operations of the group are now run under the Stanbic Bank brand name. The name differentiates the group's activities from the UK headquartered Standard Chartered Bank. Nedbank of South Africa registered a local subsidiary called the Netherlands Bank of Rhodesia in 1967. Thirty percent of the bank 's equity was floated on the Zimbabwe Stock Exchange in the same year. In 1972 the bank changed its name to the Rhodesian Banking Corporation (Rhobank). At independence the bank was rechristened the Zimbabwe Banking Corporation (Zimbank) following government's acquisition of Nedbank's equity. Zimbank established ownership of Syfrets Merchant Bank and the Scottish Rhodesian Finance (Scotfin) through a series of further acquisi-

tions. According to Cole (1974, p55) Standard Bank acquired a nnance house called National Industrial Credit Corporation in 1968, which was designated Standard Finance. The Standard Merchant Bank was created in 1973 following the purchase of a controlling interest in the Accepting Bank of Rhodesia. In the current market, merchant banking and finance house business are no longer core functions of the Standard Chartered Bank. The debt ridden finance house was disposed to ZDB where it operates as ZDB Financial Services.

Prior to the establishment of the Reserve Bank, interest and credit conditions in Zimbabwe were linked to the Bank Rate in the UK. Standard Bank managed the clearing system and the settlements were made daily in London. Independence of the Zimbabwe Financial System from conditions prevailing in London was one of the major objectives of the new central bank. Local clearing accounts were opened with the Reserve Bank when it adopted the administration of the Salisbury Clearing House. With the arrival of discount houses on the local scene, banks were able to invest daily surplus balances as money on call. A local Bank Rate was introduced for the first time in August 1957 to anchor the nascent money market on its own feet. According to Sowelem (1967, p287) all money market rates were linked to the Bank Rate: deposit rates on savings were fixed at 1% below the rate while the minimum overdraft rate was fixed at 2% above the Bank Rate; originally fixed at 4.5%. Cole (1974, p58) argues that interest rates in Rhodesia were low by international standards. It seems to me that the low rates could be attributed to excessive regulation on part of the authorities as well as collusion and lack of concern for the customers by the banks, which is evidenced by the Banking Agreement.

Following the establishment a central bank in 1956, commercial banks became subject to reserve requirements from 1957 thus providing the Reserve Bank with additional domestic resources to manage the monetary system. The requirements were first set at 8% for demand deposits and 3% for time deposits. Ranges permissible under the law were 6 to 25% and 3 to 10% respectively. The 1959 Banking Act introduced a Liquid Asset Ratio (LAR), derived from Local Liquid Assets and External Liquid Assets. Negative balances on external liquid asset were ignored to enable local branches of expatriate banks to overdraw their head office accounts. The LAR ratio was enforceable from July 1962 at a rate of 25% for commercial banks and 20% for merchant banks. In theory

the central bank had considerable power to vary the ratio, but in practice moral suasion was preferred to using formal powers.

Before the establishment of the central bank government could still influence banks' liquidity through moral suasion. In the 1950s the government issued a number of directives advising banks to restrain lending. Zimbabwe has always had a high marginal propensity to import. Rapid expansion of commercial bank lending between 1948 and 1951 from £13.4m to £34.1m facilitated the tremendous increase in imports from £58.9m in 1950 to £85.8m in 1951. Sowelem (1967, p302) suggests that depletion of external assets financed the increase in commercial bank lending prompting official pressure on banks to restrain credit. However banks remained exposed to prior contractual obligations.

The establishment of a Cental Bank facilitated the redistribution of external assets, comprising of gold and net foreign assets, "in favour of the central bank at the expense of the commercial banks," Sowelem (1967, p242). From 1965 the Reserve Bank replaced London merchants as the sole buyer of local gold. Adopting Sowelem's (1967, p233) data, the trend depicts the following:

	1958	1959	1960	1961	1962	1963
31 December	£12.5m	£4.5m	-£2.5m	£3.5m	£1.6m	-£3.0m
Annual Average	£9.1m	£9.1m	-£2.4m	-£0.3m	£3.7m	-£0.4m

In spite of the extreme fluctuations in the UK Bank Rate between 1957 and 1960, and official pressure for banks in Zimbabwe to restrain credit, the local Bank Rate remained fixed. The plight of commercial banks was exacerbated by capital flight induced by both fixed interest rates and political uncertainty as regards the future of the Federation. Typically, Zimbabwean officials were anxious to maintain the cost of short-term government borrowing at artificially low levels. In May 1960, a so called "Commercial Banks' Revolt" was launched. Commercial banks flouted the Reserve Bank's authority and unilaterally increased their deposit interest rates. On 2 August the commercial banks served notice of further increases in deposit and lending rates. The Reserve Bank was forced to hike the Bank rate of the following day to 5%; two percentage points below the London rate of 7%. Central bank authorities were hesitant to invoke untested formal powers provided in section 25(a) of the 1959 Banking Act. Although commercial banks succeeded in changing government policy, the victory

was short lived. In the long run public opinion was sympathetic to increased government control. In deed Exchange Control (E/C) regulations were extended to cover Sterling Area transaction from 23 February 1961. Remittances to London were subject to prior consultation with the central bank.

Participation in the banking sector was limited. No new commercial bank was licensed between 1960 and 1980. There were only four commercial banks in 1980 operating 113 branches in various parts of the country. Only one bank, Zimbank, was locally incorporated. The other three were branches of international banks. A wide range of products and services were offered, including deposits, loans and advances, share floatation, mergers and takeovers. As argued at the beginning of section 4.2 very few changes were introduced after independence until 1995. Commercial banks continued to provide funding to government through their high holding of prescribed paper. At independence TBs comprised 18% of commercial bank assets. Commercial banks were required to meet a statutory liquid asset ratio of 35 % of their liabilities to the public. Accepting houses and finance companies faced ratios of 30 % and 15 % respectively.

Harvey (1996) exaggerates the financial condition of Zimbabwean banks. A 1992 study by Chapman found that only Standard Chartered Bank and Barclays Bank complied with the standard 8% capital adequacy ratio in that year. Whereas Harvey (1996, p2) argues hypothetically that banks "managed to avoid or at least contain political pressure to lend on non-commercial grounds," the paper nevertheless suggests that BCCI licence "was the result of improper lobbying of politicians," (p12). In fact, surprising deficiencies, including poor asset quality, high concentration risk, weak internal controls, poor data integrity, and inadequate board oversight were unearthed following the launch of on-site inspections from 1996. Banking Supervision Department (BSD) Annual Report (1997, p6) states that eight on-site examinations were conducted that year and four Corrective Orders were issued to eliminate problems and restore the banks to a safe and sound condition. Special vehicle companies such as Apex and CBZ Nominees were established to house bad loans from Zimbank and Commercial Bank of Zimbabwe (CBZ) respectively. A Banking Supervision Annual Report for 2000 (p19) reveals that the banking sector was still plagued by poor

corporate governance, high volumes of adversely classified loans, low capital adequacy ratios, insufficient provisions for bad and doubtful debts, and failure to adhere to laid down procedures.

On average, however, the banking sector was stable and performed better than the real and service sectors of the economy in 2000. In nominal terms this is not surprising because BSD Annual Report (2000, p2) highlights that on average lending rates were "68.2% for commercial banks, 73.7% for accepting houses, and 76.1% for finance house hire purchase" at a time when demand deposits were attracting 10% at commercial banks. Increased bank profitability also benefited government, which introduced a special tax on banks in 2001.

In recent years some high leveraged clients have argued that they are being overcharged in addition to being subjected to high interest rates. Violation of the *in duplum* rule, which states that outstanding interest cannot be higher than the principle amount, has been the major bone of contention. In most cases there was no redress because the government maintained the issue was a civil rather than a criminal offence. Logically a finically ruined entity is not in a position to drag banks before the courts to the logical conclusion of the case.

Finance Houses

Cole (1973, p207)[9] points out that the first finance houses were established before World War II. A number of the institutions operated as subsidiaries of merchant banks or commercial banks. Before the 1964 Banking Act several unregistered finance houses operated in the sector. The number of registered finance houses has remained static for a long time. There were five finance houses in 1962, seven in 1973, six in 1980 and 2000. According to Cole (1973, p 208) the 1964 Banking Act permitted only registered institutions to take deposits from the public. In return, finance houses were expected to hold prescribed liquid assts not lower than 15% of their liabilities to the public. However, finance houses are restricted to long term deposits ranging 30 days to five years. The value of this restriction is academic as most finance houses are af-

116

filiated to commercial banks or merchant banks. There is a heavy bias toward negotiable certificate of deposits (NCDs), which are tradable in the money market. Beginning with the 1969 amendment to the Reserve Bank Act, finance house are expected to comply with statutory reserves requirements, originally set at 3%. The Minister of Finance also fixes terms of hire purchase. Strict controls helped to preserve profit margins by restricting competition.

With effect from 1965, finance houses shifted from the core business of hire purchase to target the productive sector. Import substitution during UDI fostered the growth of leasing facilities to meet the needs of firms that could no longer access external funds. Cole (1973, p212) observed that from 1969 the value of leasing agreements has been greater than the traditional hire purchase business. In addition finance houses were under pressure from the Reserve Bank not to extend leasing facilities for consumer goods except television sets.

Deposits that find their way to finance houses are interest sensitive. As a result finance houses are exposed to competition from commercial banks, merchant banks and building societies. There were exorbitant interest rates in the market in 2000. Finance houses experienced some funding problems arising from the flight of deposits into the money market. On their part, the institutions curtailed loans in favour of low risk, high return money market instruments.

Building Societies

The concept of modern building societies is known to have originated in Birmingham, Britain, in 1775 although the sale and purchase of houses could be traced into the annals of history.[r] Early friendly societies terminated after each member was granted a house. The emergence of permanent societies in place of terminating societies enabled participants and investors to separate borrowing from lending. These developments enhanced the intermediary role of building societies by facilitating capital accumulation, which helps to raise a community's productivity and output. As regards the essential function of intermediation, there is no distinction between banks, finance houses, insurance

[q] This paragraph draws heavily on Cole (1973) "The Finance houses in Rhodesia," *The Rhodesian Journal of Economics,* December Vol. 7 No. 4
[r] This subsection is based on Chirozva (1991) "The Role of Building Societies in Zimbabwe." unpublished essay.

companies, building societies, investment trusties, or any other type of interme-
diary. The distinction lies in the nature of claims and services offered to borrow-
ers and lenders. Regulation also buttresses artificial market segmentation.

In Zimbabwe, Cunningham (1964), cited in Cole (1973b, p59), identifies
the Midlands Building and Investment Society founded in 1924 as the first
building society to be established. The Cental Africa Building Society (CABS)
followed on 15 August 1949 after the merger of a number of societies. It grew
into the dominant building society in Zimbabwe. Early building societies oper-
ated under the Companies Ordinance because there was no appropriate legis-
lation. Reliable records can be traced back to 1952. However Sowelem (1967,
p181) argues prior to that the sector was rather small. This might be true given
that total assets as at 31 December 1952 were only $4m. However, it must be
borne in mind that some societies failed to meet the registration deadline. That
said it is self evident that sustainable expansion was realised after 1951 when
new laws were enacted to reorganise the industry. The Building Societies Act
1951 drew insight from South Africa. Officially the Act was designed to prevent
the mushrooming of unsafe and unsound institutions. Societies that failed to
register in terms of the Act were either dissolved or allowed to merger with an
existing institution. The legislators, recalls the Registrar in the First Annual Re-
port, designed building societies to provide a medium for "investment for the
small man". In my view, building societies have borne the heaviest regulatory
burden.

As shown in the table below Beverley Building Society was one of the
earliest societies to be incorporated in 1952 in terms of the 1951 Building So-
cieties Act. Indeed the table shows that the 1950s were characterised by ex-
pansion of the building societies movement. Sowelem (1967, p183) insists that
up to 1960 building societies in Zimbabwe were able to attract foreign funds es-
pecially from South Africa.

Table 5

Early Building Societies

Name of Society	Head Office	Date of Registration

Beverly Building Society*	Harare	1 April 1952
Central Africa Building Society [CABS]	Harare	10 April 1952
Midlands Building and Investment Society	Gweru	28 November 1952
Centenary Building Society	Bulawayo	7 May 1953
Founders Building Society* [Intermarket B. S.]#	Harare	12 February 1954
Rhodesia Building Society	Harare	26 August 1954
Old Mutual Building Society of Central Africa*	Harare	8 September 1954
Commonwealth Building Society	Harare	8 August 1955
Rhodes Building Society	N/A	14 June 1958

* These societies still existed in 2001. CABS was actually taken over by Old Mutual Society who decided to retain the name of the former. # Founder was acquired by the Intermarket Group in 2001 and changed its name to Intermarket Building Society. [Source: Registrar of Building Societies Annual Report –various]

The proliferation of building societies was short lived. Reports of the Registrar of Building Societies attribute problems in the sector in to events in the Belgian Congo in July 1960, and uncertainty about the future of the Federation. However, Sowelem (1967, p183) points out that the accelerated withdrawal of funds was precipitated by a 1960 run on Kenyan and then Zambian building societies. Extension of exchange controls to cover sterling area transactions in February 1961 also affected the confidence of foreign investors. The resultant liquidity crisis was so severe such that no new mortgage lending were extended between July 1960 and December 1961. The crisis brought with it compulsory consolidation and amalgamation of building societies in Zimbabwe in order to restore confidence in the building society movement.

Although seriously affected societies received government, central bank and peer surport mergers and amalgamations reduced the number of societies from 8 to 3 between 1957 and 1962. One of the earliest mergers took place on 1 July 1957 when Midlands Building and Investment Society merged with Beverley Building Society. Assets of the short-lived Rhodes Building Society were taken over by the Commonwealth Building Society on 1 March 1961. On 30 May 1962 assets of the Commonwealth Bank were transferred to Beverley Building Society. Meanwhile Rhodesia Building Society had amalgamated with Founders Building Society on 1 July 1961 to create a new society, which retained the name Founders Building Society. As at 1 July 1961 Old Mutual

Building Society took over the Centenary Building Society (which had changed its name to Bulawayo and National Building Society on 8 December 1960) and the Central Africa Building Society. Following the acquisition of the two institutions, Old Mutual Building Society assumed the name Central Africa Building Society or CABS for short. By the end of 1962 the building societies left were CABS, Beverley and Founders.

Sowelem (1967,p184) highlights that the amalgamation were initiated by the central bank. However neither Sowelem nor the Registrar of Building Societies provide the exact details of the role played by the Reserve Bank. In fact footnote 14 in Cole (1973b, p147) demonstrates that all societies that survived the crisis "had close connections with other powerful financial institutions: CABS with [Old Mutual]; Founders with the Anglo-American Corporation; the Beverley with the Pearl Assurance Company." Composition of the societies' board of directors also reflected the close ties. The phenomena of close ties in the Zimbabwe financial system has already been discussed at length in this thesis.

As expected no new entrants joined the building societies movement between 1962 and 1990. Obviously at independence in 1980 there were three building societies occupied with the provision of mortgage finance to existing and new building construction. Two new building societies, Zimbabwe Building Society (ZBS) and First National Building Society (FNBS), joined the sector in the 1990s. However these non-aligned societies have not faired very well. ZBS was taken over by the Reserve Bank in 1999 to save the society from imminent collapse due to high volume of arrears, poor management and poor records.

On average building societies operated under difficult conditions in the 1990s. Their problems emanated from stringent regulatory constraints and an adverse macroeconomic environment. Regulation of building societies is embodied in the current Building Societies Act (Chapter 24:02). The law, which gives them a unique cooperative status, has over the years subjected building societies to strict state control. Unlike other financial institutions, building societies' operations are entirely domestic because the law forbids them from operating from other countries. In contrast, Sowelem (1967, p182) observes that building societies in neighbouring Zambia and other British Commonwealth countries were not subject to this restriction. According to Cole's (1973b, p140)

analysis, in 1972 building societies ranked as the second largest group of banking institutions as measured by asset values. The BSD Annual Report (2000, p3) demonstrates that building societies were ranked third after commercial and merchant banks in 2000.

Nevertheless, building societies have a monopoly in mortgage finance, which is protected by law. Building societies have minimal reserve requirements in return for government administered interest rate caps on deposits and advances. In addition it must be acknowledged that building societies do not pay taxes on any of their earnings. Investment income accruing to depositors on Class "C" share certificates is also tax exempted. Interest expense on mortgages loans is also tax deductible in the hands of a borrower liable to tax.

Building societies, however, compete with other deposit taking institutions, including the POSB and the stock market for deposits. By law building societies are expected to maintain a liquid asset ratio of at least 15% of their liabilities to the public. Under the banner of maintaining confidence and liquidity in the financial system legislators guarantee subscription to government stocks, bills, bonds, and debentures even at times when the yield is unattractive. Therefore building societies provide funds to government through their holdings of government paper. Building societies also fund government and local authorities low cost housing schemes.

Zimbabwean building societies have over the years been encouraged by the regulatory framework to conform to the ideological persuasions of the time. Building societies are answerable to the Registrar who in turn reports to the Minister of Finance and Economic Development. Politicisation of the housing policy and the ever-increasing cost of building materials have challenged the service delivery potential of building societies. Building societies are not allowed by law to own industrial and commercial properties in their own right. The capacity of building societies to invest in residential properties has been constrained by a number of factors; among them are administered lending rates and bureaucratic inefficiency in the public sector. Building societies have not been given the opportunity to field their own land surveyors. As a result they depend on resource constrained local authorities to approve projects and service new stands. The retention of administered interest rate regimes for building

societies and the POSB in 1992, at a time when commercial bank rates were being liberalised, exposed them to severe liquidity problems.

Although many writers portray building societies as a brainchild of early industrial workers and tantamount the societies to a "rebellion" against poor housing conditions, a critical evaluation of their subscriptions suggests they were predominantly middle-class oriented in origin and taste. Cole (1973b, p142) found evidence that building societies cut down on lending even when the liquidity ratios were on average in excess of 20%. In practice smoothening advances is a preferred strategy at a time when inflation fed investment demand for housing is high. Cole's poetic characterisation of the 1972 housing market is still valid today in that the rich continue to benefit at the expense of the poor; property owners at the expense of first time buyers; and the old at the expense of the young (p146-7). The only notable exception is that residents can no longer benefit at the expense of the immigrants if the later has foreign currency, a highly priced commodity on the black market.

In my view, Zimbabwe probably experienced a general market failure in year 2000. Exorbitant interest rates on the money market, which were fuelled by rampant inflation, led to a credit crunch. Most investors switched their savings into the money market where returns were high and risk low. Like other deposit taking institutions, building societies experienced acute funding problems. The societies resorted to expensive NCDs for deposits. Building societies, in tandem with other financial institutions, also abandoned their core business of providing risky low yield mortgage loans in pursuit of high return Treasury Bills.

People's Own Savings Bank

The POSB is a joint responsibility of the Ministries of Finance and the Post and Telecommunications. The Post Office Savings Bank Act [Chapter 24:10] regulates it. According to Mataruka (1999,p4) the POSB falls under the trusteeship of the Secretary of the Treasury, the Governor of the Reserve Bank, and the Postmaster General. The institution does not lend to the private sector. Its intermediary role is limited to the channelling of deposits to government. A large portion of the POSB's liabilities is in the form of saving deposits as per

statutory requirements. Theoretically the POSB has some discretion over the composition of its asset portfolio, but in practice it grapples with political pressure to hold government securities. The POSB is in fact usually the largest single holder of government stock among all the banking and financial institutions. The whole of its asset portfolio is sometimes invested in government paper.

Development Institutions

Zimbabwe has over the years witnessed a plethora of development institutions although their activities are not very conspicuous to the general public. Most of these institutions are now defunct but some have endured to the present day in one form or another. Barclays Overseas Development Corporation Limited, a subsidiary of Barclays Bank D.C.O., was established in 1947 to cover several colonies. Its initial capital was £5m. It provided medium-term loans for development purposes and provided underwriting services for non-government projects. The Anglo-American Development Corporation provided funding for projects in the natural resources sector run by government or the private sector. This institution also provided offshore finance. A Standard Chartered Bank affiliated institution known as Standard Bank Finance and Development Corporation was incorporated in London in 1946 with a capitalisation of £500 000.

The Zimbabwe Development Bank (ZDB) was established in the early 1980s. Government held 51% of its equity. The bank specialises in medium term lending but expects project promoters to also contribute a substantial portion of the equity. ZDB works in close conjunction with the Venture Capital Company of Zimbabwe (VCCZ), a company set up at the insistence of the Reserve Bank. As implied in its name VCCZ provides capital for start up ventures. It also offers entrepreneurial guidance through the provision of board directorship, accounting, and management services. Promoters of successful ventures are expected to buyout the VCCZ within five years.

IPCORN, acronym for Industrial Promotion Council for Rhodesia and Nyasaland was established in 1960. It was run as an independent, privately owned development board financed, controlled and owned by leading banking, insurance, mining and industrial companies. Its name was changed to Industrial

Promotion Corporation of Central Africa in 1964. The institution focused on the provision of medium-term capital and managerial advice. Project promoters were expected to meet 50% any project's capital requirements. The Southern Rhodesia government in 1959 established a related institution, namely the Industrial Development Board.

Eventually the Industrial Development Corporation, IDC for short, was also created in 1963. It provided long-term capital, via loans and equity participation, to new and established ventures that were in turn subjected to managerial supervision. A lesser-known subsidiary known as Zimbabwe Development Corporation (ZDC) was also active in this respect. IDC also built factories for rent or sell to business concerns. Unlike conventional financial institutions, activities of the IDC are not very accessible to the general public. The institution operates like a government investment company with very broad objectives ranching from industrialisation, research, employment and promotion of new technologies. Its Greenfield portfolio expanded drastically after independence. At one time both the IDC and ZDC housed some of the worst performing and debt-ridden companies. Among the projects were notable insolvent entities such as National Glass and Cone Textiles. As is typical of many state owned corporations, divesture from troubled investment was very slow and fraught with bureaucratic wrangles. The need to guarantee employment often had precedence over economic and financial acumen.

The performance of special soft windows for development has been dismal, providing no significant contribution to economic development. The Development Finance Corp (DFC), a parastatal, was established in 1979 to carter for the financial needs of the small and emergent businesses. Harvey (1996, p15) notes that the institution was overwhelmed by rapid expansion, bad debts, and political pressure to lend to the politicians themselves. By 1981 the new lending was stopped, the board of directors was dismissed and the administration of the parastatal was handed over to IDC.

A new organisation, the Small Enterprises Development Corporation (SEDCO) was created in 1984 to replace DFC, which was wound up in 1985. Harvey reiterates that SEDCO continued to make losses despite access to concessionary grants from government. Like the AFC, SEDCO suffered from in-

adequate capital and want of autonomy. Apart from SEDCO there were several other schemes in the 1990s under which the cost of borrowing was subsidised. A parallel entity, known as the Credit Guarantee Company (CGC), jointly owned by the Reserve Bank (50%), commercial banks and ZDB, provided funding to SMEs at 5% at a time when banks were lending at 39% in the market and deposit rates were in the region of 20%. The scheme was politicised. Government guaranteed loan repayment hence there were huge incentives for moral hazard behaviour on part of both the banks and the borrowers. Even the most sound privately owned banks carried disastrous CGC portfolios in the late 1990s.

Other subsidised credit schemes such as the Social Development Fund (SDF), and the Z$100m, Z$400m, Z$700m, Z$1bn facilities provided for through donor assistance did not fair any better because recovery rates were next to nil and there was no resolute follow up on defaulters. Theoretically, these facilities should have enhanced the viability of SMEs, and indirectly promoted economic prosperity because credit was usually accessed at 5% at a time when market rates were in the region of 30 to 40%. Harvey (1996, p26) emphasised that default rates on these soft windows were "typically above 50%, and ranging as high as 97% for the [SDF] which was used most extensively for political patronage..." Despite constitutional complications regarding the appropriation of state resources, it seems that a National Investment Trust (NIT) is being established on the sidelines ostensibly to facilitate the transfer of state owned assets to the indigenous population. There is no mechanism to ensure that the scheme will benefit the most disadvantages citizens. Listing the NIT on the stock market, for example will benefit the rich. Until Zimbabwe starts to give practical effect to financial safety nets such as disclosure, transparency and accountability nothing will come out of the numerous soft windows for development.

Representative Offices

The Registrar of Banking Institutions' Annual Report (1994) shows that 8 representative offices were operating in the country that year. These included the African Development Bank (ADB), World Bank, Société General, State Bank of India and the Bank of Yugoslavia. In the previous Banking Act [Chapter 188] registration of a representative office was not a legal requirement. However,

representative offices were restricted to arranging external loans subject to prior Exchange Control approval. Nevertheless registration was required in terms of the Companies Act and for tax purposes. Section 28 of the new Banking Act [Chapter 24:20] irons out these inconsistencies. Under the new Act the Registrar's approval is required to open a representative office. The applicants must have support of their home country's supervisory authorities. No banking business can be conducted from a representative office. Although the new Banking Act section 8 (4) provides for the establishment of foreign owned banking institutions, none has opened for business since financial liberalisation in the early 1990s. However, the degree of foreign ownership is subject to prior approval by Exchange Control and the Zimbabwe Investment Centre (ZIC)'s own criteria.

Insurance and Pension Funds

Insurance companies, pension and provident funds play a pivotal role in mobilising savings and capital formation in Zimbabwe. Payment of insurance premiums and pension contributions are an important source of personal savings in the country. Insurance companies and pension funds are an important source of long-term capital for new and existing projects. In fact there is a heavy presence of pension and insurance funds in government securities, fixed property, shares, and the money market. Government sets high liquidity levels.

According to Paul Mkondo (1992, p25) there were one or two British life Insurance companies in Zimbabwe by 1898. However, a more authoritative account by Chimombe (1983) suggests that there were three insurance companies originating from South Africa, Britain and Australia by 1902: Old Mutual, the biggest insurance company was registered in South Africa in 1888. It began insurance operations in Harare and Bulawayo in 1900. Norwich Union Insurance Society, a British Company, opened an agency office in Zimbabwe in 1901. Its representatives commenced both life and fire insurance in 1903. Colonial Mutual Assurance Company, which was founded in Australia in 1873, commenced operations in Bulawayo in 1902. However, Colonial's activities were directed from South Africa where the group had established in 1883.

126

Evolution and structure of the Zimbabwean insurance industry is documented in detail in Chimombe (1983,p190-230). Her account, which covers about 40 pages, is still very accurate except for a localisation campaign spearheaded by Exchange Control between 1987 and 1993. In brief, Chimombe demonstrated that foreign owned companies dominated the industry. In 1971 for example, Cole (1974b) noted that only seven out of 76 companies had local head offices, the rest being branches of British or South African companies. Insurance companies exercised profound influence in the economy, particularly in the financial sector, through interlocking directorships. Compulsory insurance with a preselected insurer was a condition to get a mortgage from any building society. The industry served a predominantly white clientele until 1980. Chimombe, who had great faith in state ownership of resources to accelerate economic growth, supported wholesale localisation of the industry to curtail capital flight through external reinsurance premiums, management fees and transfer pricing. History has not been kind to her conclusions, as evidenced by the demise of communism and poor economic growth in postcolonial Zimbabwe.

The idea that overt state control would perfect the allocation of resources misses the point indirect control was already too high. There is heavy purchase of government securities by insurance companies and pension funds. Life insurance companies are required by law to maintain an unimpaired pool of assets equal to the sum of their liabilities in Zimbabwe. Both Chimombe (1983,p206) and Cole (1974b, p67) attribute the high holdings of government securities to "lack of other suitable investment opportunities" given a small equity market "in relation to the funds which the insurance companies have to place..." Good quality local script is closely held. Exchange controls regulations preclude fund managers from investing in externally registered shares. Property development is retarded by exchange controls and foreign exchange shortages. Tax concessions also make high concentration on government paper an attractive financial investment. Chimombe, closely led by Cole, correctly noted the "profits on the realisation of government, municipal and statutory corporation securities are generally not liable to tax." Of course the law also prescribes high concentration in government securities. Holdings in excess of the legal requirements are also reinforced by moral suasion. The transaction demand for money motivates investment into marketable securities.

127

The insurance industry also experienced a number of mergers in the 1970s. As in other industries in the financial sector the Insurance Association of Central Africa enforced collective tariff agreements in the non-life insurance market. The long established agreement helped to eliminate cut-throat price competition. The UDI era monopoly and improvement in service delivery also helped to increase profitability before independence.

About 50 insurance companies operated in the country by 1980 down from 76 recorded in 1971. According to Cole (1974b, p59) the 1971 industry comprised of 17 life only, 21 life and non-life, 35 non-life, and 3 funeral only insurance companies. About 18 brokers were part of the service delivery chain. Since 1980 the sector has experienced substantial growth and now carters for a wider section of the population. The Registrar of Insurance Companies disclosed that there were 9 life only (including 3 life reinsurers), 24 non-life (5 reinsurers), 18 funeral assurers, 41 brokers, 40 multiple agents and 2424 sole agents by mid 2001. The industry controlled about $55 billion in total assets of which $10 billion was in prescribed assets. Mkondo identifies aids, inflation, taxation, and political stability as the major threats to the insurance industry.

Life insurance is still dominated by Old Mutual. The Zimbabwe Independent Insurance Survey 2001 indicates that Old Mutual accounted for 70% of gross premiums, 72% of the net premiums and 77% of the total assets market share in 1999. Total assets of the industry amounted to $39.6 billion in the same year. Old Mutual has investments cut across the entire spectrum of the Zimbabwean economy. The society has a substantial stake in almost every counter on the Zimbabwe Stock Exchange. State owned Zimbabwe Reinsurance (ZimRe) controlled 65% of the reinsurance business (or $1.9 billion in premiums) in 1999 because it is given preferential treatment by the insurance law. Mandatory reinsurance with ZimRe may be phased out following the listing of the company on the stock exchange.

All pension, provident and retirement annuity funds are registered, and comply with the Pension And Provident Fund Act of 1976 [Chapter 24:09] as revised in 1996. Not much is recorded about these institutions prior to that date. It is strange that the first annual report is dated as late as 31 December 1977 yet it records that about 1192 funds were inexistence. Ironically these private

and quasi-government pension funds are significant participants on the ZSE and the local money market. In my view, the treasure of insurance records prior to 1977 must be laying forgotten somewhere.

Until the launch of compulsory membership to state owned National Social Security Authority (NSSA) in 1994 there was no national scheme for retirement pensions. The authority is now a major investment player on the Zimbabwean equity market. However, it is a moot point whether future NSSA pensions will sustain life given the paltry contributions levied. Nevertheless there is strong support for flexible yet compulsory contributory pensions in the literature. Australian "Superannuation" allow beneficiaries to choose their own fund managers.

Civil servants were exempted form joining NSSA because government could not afford the obligatory employer's contributions that go with the scheme. However, civil servants are entitled to contributory Government Pension Scheme at a subscription of 7.5% of one's monthly salary. According to Cole (1974b, p92) contributions are paid into the Consolidated Revenue Fund as no pension fund was established. Payments are also made out of this fund. Following upon this it might be possible that taxpayers collectively underwrite civil servants' pensions in addition to paying the salaries out of which the contributions are made from in the first place. In contrast a few private pension schemes operating in the market are self-administered while the bulk of them are underwritten and administered by insurance companies.

As a developing country Zimbabwe does not have old age pension or unemployment benefits despite a need for the services. Before independence the state administered a complicated non-contributory old age pension scheme for non-Africans who qualified. Nowadays all the destitute who are informed approach the Social Welfare Department for assistance. If pegged against inflation the allowances disbursed are meagre and cannot sustain a decent livelihood. Given the vicious poverty and scarcity of funds chances of reform are remote.

The Zimbabwe Stock Exchange

In recent years financial literature has shown great interest in "emerging equity markets" as ideal for diversification and good returns. Emerging markets

are regarded as countries showing high potential for economic growth alongside with high political, fiscal, economical and market related risks. Historically capital markets and financial institutions were regarded as alternative approaches to financial architecture. This research, following Beck, Demirgüç-Kunt, and Levine (1999, p2) and others, emphasises the complementary roles between the two.

In theory there are many benefits and costs to equity market development, as argued in Sudweeks (1989,37-47) and Claridge and Box (2000) for example. Apart from raising capital, equity markets facilitate economic development in a number of ways. Sound equity markets increase the efficiency of the financial system via multiple investment opportunities, which implies more choice. Increased competition for funds among firms enhances financial system efficiency if the competitive forces result in a fair return on investment.

Claridge and Box (2000, p.1) bring home the point that capital markets help close the gap between domestic and international cost of capital. Integration of capital markets improves the quality of price signals on the local market. This development enables investors to assess the true value of investment opportunities more accurately thereby facilitating the efficient allocation of resources. Following upon this, productivity is also expected to increase.

Sudweeks emphasises that equity markets contribute to "financial system solvency" by lowering the debt/equity ratios among firms. Existence of deep secondary markets increases the supply of long-term funds to government and private firms. Emerging equity markets such as Zimbabwe have potential to lower the external debt through increased mobilization of local resources and the use of debt equity swaps. Equity markets also facilitate the transparent privatisation of state owned firms. Listing on the exchange often entails adoption of better accounting and disclosure standards, which facilitates better economic decisions. Claridge and Box support the view that capital markets improve allocative efficiency through greater transparency, reduced favouritism, rent seeking (corruption), and regulatory avoidance.

Broadening the ownership base of firms through capital markets helps eliminate monopolistic tendencies in the economy. Schumpeter has taught us that competitive markets facilitate constructive innovation. Claridge and Box

(2000) reinforce this idea by emphasising the potential of capital markets to "encourage innovation and efficiency in domestic financial markets" and the use of sophisticated instruments such as futures, "which stimulates further trade".

Singh (1997) strongly argues that there are greater costs than benefits to equity market development in emerging markets. Minsky (1977) and Kindleberger (1996) both emphasise that the financial system is inherently unstable. Critics argue that developing countries lack the sophistication and willpower to manage the inevitable turbulence. Unsophisticated capital markets are more vulnerable to the possibility of low investor confidence, speculative attacks, interest rates repression, high intermediation costs, loss of local ownership, capital flight, and inefficient allocation of resources from a national viewpoint. Therefore capital markets could harm economic activity in small open economies.

A lot of other costs are associated with the free flow of international funds into small economies as highlighted during the East Asian financial crisis of the late 1990s. In Claridge and Box's (2000, p32) own words, "the real economy responds to change more slowly than financial capital" which could result in severe real adjustment costs to sudden flow of funds. In their view, excess liquidity in the market exaggerates changes in market sentiment giving rise to the risk of contagion. Furthermore rapid capital movements could increase interest rate, exchange rate, and asset prices volatility to levels not supported by economic fundamentals. Distortions in asset prices may be inflationary whereas exchange rate shocks could lead to "resource misallocation, particularly between tradeable and non-tradeable sectors." Externally induced asset price bubbles have the potential to magnify inequality. In Zimbabwe, for example, customers with foreign currency were given first preference in the property and motor vehicles industries in 2000/1. High reliance on foreign capital may constrain fiscal and monetary policy options to the state as well as create current account deficits, which could raise "the cost of borrowing for the country as a whole." (Ibid p31)

This said, the barriers are solvable and the long-term benefits are great. As with anything in life, the long run cost of doing nothing could be more severe.

The International Encyclopaedia of the Stock Market (Volume 2, p1186) regards the Zimbabwe Stock Exchange (ZSE) as a small (by world standards) but active stock exchange in Africa second only to the Johannesburg Stock Exchange (JSE). It is at the pinnacle of the equity capital market in Zimbabwe. It operates under an act of parliament as well as self-imposed regulations. Until the late 1990s, membership of the exchange was limited to individuals. New members were required to have prior experience with an existing broker. The ZSE requires that companies wishing to go public must make at least 30% of the shares available to the public on listing. No less than 1000000 shares must be issued and the number of shareholders must be more than 300.

The first exchange was established in 1896 in Bulawayo. It was followed by other exchanges in various centres of the country. A modern stock exchange was established and located in Bulawayo in 1946. According to Newlyn and Rowan (1954, p143) the exchange had 22 trading brokers and was modelled on the lines of the Johannesburg Stock Exchange. A duplicate floor was opened in Harare in 1951. Brokers also met in Harare for a daily call over of prices, which were telephoned to Bulawayo for amalgamation and compilation. Sowelem (1967, p166) noted that there were 98 listed companies in 1963, but the number of practising brokers had dropped to thirteen: five in Bulawayo, one in Mutare and the remainder in Harare. The ZSE has been based in Harare since 1975. In 2000 the Stock Exchange had 13 Stockbroking firms in its membership. Each firm employed a number of advisors who specialised in a wide range of services such as investment, financial planning and research. The range of services offered differs from firm to firm.

The exchange provides a primary market for equity issues and a secondary market for all government registered stock; all local municipal stock; shares (ordinary and preference), and debentures of listed local companies (Newlyn and Rowan p145). Parastatal paper, for instance the Zimbabwe Electricity Supply Authority (ZESA) bills, also make its way onto the ZSE. Brokers meet in Harare for a daily call over of prices. De Caires and Fletcher (1990, p210) noted that stocks are traded in alphabetic order. Open call overs are held in mornings and afternoons at the ZSE premises where individual brokers announce buying and bid and selling offer prices for listed stocks in a mini-auction.

The system is paper based. Settlement is required on the day of delivery against the physical delivery of scrip on a Trade date + seven days (T+7) basis. Clearing is handled on a transaction-by-transaction basis. Regular board lots comprise of 100 shares. Brokers can act as agents of buyers and sellers or in own names as principals.

A trading record stipulating bid and offer prices and the volume of sales is circulated to all broking firms and published in the daily press by the ZSE. There are two major indices, the Zimbabwe Industrial Index and the Zimbabwe Mining Index. Index calculations are based on the capital weighted method. Plans are underway to design a composite index that incorporates all traded stocks. However, private asset management firms have introduced several indices of their own, some of which are based on recently introduced derivative products. Although the Zimbabwe Stock Exchange boast of having share prices for every trading day since 1946 the data is not in useful form[5]. The exchange does not have a single record documenting the appropriate time series data. Whereas the base date for the ZSE Industrial Index is 1967= 100, reliable data produced by the Reserve Bank dates back to 1975. Furthermore, the market capitalisation attribute is not part of the series kept by the Reserve Bank. The central bank's data on share turnover is in index format, which renders comparative studies with other bourses difficult in the absence of market capitalisation figures. Market liquidity for instance, is commonly defined by expressing turnover over market capitalisation. In this regard Zimbabwean researchers resort to the Emerging Stock Markets Factbook(s) for appropriate statistics. The pedagogic value of empirical research has not been taken seriously. Research enhances market efficiency and adds new insights to the body of knowledge.

The institutional features of the ZSE closely resemble the financial institutions with regard to concentrated ownership, limited participation and significant government controls. A few shareholders control a high proportion of shares in companies listed on the Zimbabwe stock exchange. In 1993 a single institution, Old Mutual, controlled at least 10% of the total market value of shares on the bourse. Two industrial giants of Southern Africa – Lonrho and Anglo American Corporations – controlled substantial holdings. The government

---

[5] See: Speech by Mr. R. T. G. Williams, Chairman of The ZSE to the ZNCC on 16 September 1988.

also exercised significant control on the ZSE through direct and indirect holdings. To date Old Mutual is within the top ten shareholders of almost every counter on the ZSE. Supply of good quality scrip is limited because dominant institutional investors usually pursued "buy to hold" strategies. A 1992 study by Chapman put the proportion of closely held shares at 81.19%. Therefore the stock market was characterised by low depth as evidenced by very low ratios of turnover to market capitalisation. Participation by individual shareholders is still limited due to ignorance, risk averseness and lack of adequate disposable income. There might be need to educate the public about stock market activities. Fiscal incentives such as tax benefits, positive real incomes, and better standard of living may be required to enhance market depth.

Although Zimbabwe has maintained a relatively vibrant private sector over the years there is little reliance on the stock market as a primary source of capital. In aggregate the exchange remains a minor source new capital, despite some episodes of high activity over the years. Hawkins (1976, p117) argues that the private sector was responsible for 60% fixed capital formation between 1965 and 1974. Of this a mere 4.9% was raised through the public issue market. Sowelem (1967, p 167) observed that on average $3m was raised annually between 1955 and 1959. Mataruka (1999, p54) argues that the 1980s were characterised by shortage of scrip. Hawkins suggests that listing rules militate against small companies that dominate the Zimbabwean economy. However, I agree with Sudweeks (1989, p61) that loss of control and disclosure requirements are major fears among owners of closely held family firms. A number of firms only list the minimum percentage of shares allowed by the exchange. Authorities may also distrust free ownership and private enterprise resulting in inefficient or over-regulation. A considerable degree of confidence is necessary because investors are sensitive to political uncertainty. As highlighted throughout this thesis the institutional framework must facilitate the transfer of information, disclosure, transparency and accountability to instil confidence in the market.

In the mid 1990s there was a clear trend towards deregulation in Zimbabwe. ESAP brought with it a significant relaxation of foreign investment guidelines. Prior to economic liberalisation, activity on the ZSE was adversely

affected by strict exchange control restrictions on dividend remittability and participation of non-resident investors. At the end of 1980 there were 62 domestic companies quoted on the ZSE. The number of listed stocks fell to 55 in 1985 and 53 between 1986 and 1988. The Zimbabwean stock market was opened to foreign investment in June 1993 up to a limit of 25% per counter, dividends of which were 100% remittable. The ceiling on foreign portfolio investment was progressively increased to 40% by December 1996. However, no single non-resident shareholder can purchase more than 10% per counter. In July 1993 capital gains on listed securities was reduced from 30% to 10%. Tax on dividends was cut from 20% to 15% in 1994. The turnover ratio rose from 5.2% 1993 to 11.5% in 1994.

Table 6 below shows the pattern of activity on the stock exchange in recent years. On average liquidity, as depicted by the turnover ratio, has increased since 1990. Market capitalisation rose steadily in US dollar terms until the onset of an economic crisis in 1997. In Zimbabwe dollar (ZWD) terms market capitalisation continues to increase year after year due to high inflation. The Zimbabwe Stock Exchange performed exceptionally well in 2000 and 2001 despite deterioration in economic fundamentals. Negative returns in the money market following the slashing of interest rates by the Reserve Bank in January 2001 left many investors with no option but to switch to the stock market. To some extent buoyant share prices provided a hedge against inflation in 2001.

Table 6

ZSE Statistics: selected years

	1982	1985	1990	1995	1996	1998
Number of Listed Companies	62	55	57	64	64	67
Market Capitalisation (ZWD) m	326	591	6373	18988	39337	48770
Market Capitalisation (USD) m	355	360	2395	2038	3635	1310
Trading Value (ZWD) m	57	14	126	1299	2555	3931
Trading Value (USD) m	75	9	51	150	255	166
Turnover Ratio (%)	-	3.3	2.9	7.6	8.8	9.2

Although market activity is on the increase in Zimbabwe dollar terms, no clear-cut conclusions can be drawn with regard to efficiency. In finance theory, market efficiency refers to the assumption that share prices reflect all available information that investors consider relevant to decide whether to buy, sell or hold on to their shares. Three form of market efficiency are well known in the literature; namely weak form, semi-strong form and the strong form. These concepts reflect respectively the degree to which all historical, all public, and all available information whether public or private is reflected in the share prices. Empirically efficiency is evidenced by the absence of significant serial correlations, i.e. price autocorrelations not significantly different from zero. Generally emerging markets such as Zimbabwe are considered to be weak form efficient.

There are some important dimensions of market efficiency other than price such as allocative, operational and structural efficiency. Conventionally operational efficiency is assessed on the basis on transaction costs and the length of the transaction cycle. Theoretically transaction costs reflect the cost of intermediation. Therefore the lower the transaction costs and the thinner the margins between bid and offer prices the more efficient the market is deemed to be. In Zimbabwe brokers do not compete on the basis of commission, as transaction costs are collectively determined, in concurrence with government, hence do not reflect competitive efficiency of the brokers. In practice there are long delays on the transfer of scrip. If one sells shares on the market through a broker, it takes in practice a standard two weeks to receive payment. Another week or two are required to clear the cheque with banks before value can be given. Such transactional delays reduce the liquidity and turnover of the market. Technically, liquidity refers to the duration it takes to consummate trade without undue loss of value. From a liquidity point of view, an investor is better off placing money with a bank where access can be unrestricted. Nevertheless plans are underway to establish a central scrip depository to speed up transactions.

Chronic negative real returns in the money market, however, make the sock exchange a relatively better medium for investment to enlightened investors. Table 7 below shows that a lot of Zimbabwean Initial Public Offerings

(IPOs) are oversubscribed several times over. Admittedly there are a lot of issues on IPOs that are outside the scope of this thesis.

Table 7

Selected IPOs on the ZSE

Year	Company	Issue (Z$'000)	Subscription Times	Issue Price (cents)	Opening Price (cents)	Premium Z$
1960	Rhodesia Television	–	15.5	–	–	–
1967	Rhobank	1 050	4.5	150	164.3	9.5
1969	Maceys	625	5.4	62.5	75.8	21.3
	More Wear	733	16.0	66.6	120.5	80.9
	Freecor	883	6.7	60	68.8	14.7
1973	Everglo	920	9.6	80	94.8	18.5
	RAHL	3 150	13.3	210	307.5	46.4
	Gulliver	1 470	8.5	70	77	10.0
1974	Edgars	1 400	9.9	100	113	13.0
2001	Trust Bank	358 000	21.6	1500	9600	81.0

[Source: Table II Hawkins (1976, p123), amendments added]

In financial theory it is generally accepted that expectations and investor preferences affect prices. And so do herd mentality and bounded rationality. A lot of speculators buy into IPOs in the belief that the issue is underpriced. It seems to me there is an element of herd mentality on the Zimbabwe Stock Exchange during listing, hence the very high opening price on the first day of trading. However, speculators are reluctant to commit their funds in the long term, which results in depressed stock prices in the medium term. Within a few years after spectacular debuts on the exchange, a lot of companies listed in Table 7 traded below their issue price levels, let alone the opening price levels. Of course I agree that past performance is no guarantee to future success.

Sudweeks (1989, p28) suggests that investor preferences to buy, hold or sell shares depend on market efficiency, liquidity and segmentation. With regard

to market liquidity, Sudweeks outlines three hypotheses that have been advanced to explain the sale of securities below the present value of their "risk adjusted discounted future cash flows." The liquidity premium, or price pressure hypothesis postulates that the price of shares falls when a large block of shares is offloaded onto the market. The fall in prices for the duration of the transaction is referred to as the liquidity premium. Recovery in prices usually takes place soon after the transaction. In financial theory share prices have a signalling effect, which conveys information not available to management of the firm. Therefore the information effect hypothesis stipulates that trading in a company's shares brings new information onto the market. As a result no recovery is envisaged after the fall in stock prices on the market. The substitution hypothesis, however, presupposes that stocks are perfect substitutes. Therefore trading in any volumes of shares should not bring about any change in the price. Price movements only come about as a result of new information received on the market. According to the modern portfolio theory assets bearing the same amount of risk should earn the same return in fully integrated markets. In practice capital markets are exposed to different cultures and resource endowment even within the same country. Therefore in segmented capital markets different rates of return can be realised on assets bearing the same level of risk. Although segmented capital markets have the potential to reduce stock prices, they also provide an opportunity for diversification.

From a structural efficiency perspective enforcement of ZSE guidelines has been subject of a lot of criticism ranging from serious allegations of inside dealing and preferential treatment. In the past broking firms were allowed to operate with low asset values and a very small security fund compared to their liabilities. However bold reforms are in the pipeline. Listed companies are expected to adopt principles of good corporate governance to enforce good accounting standards, disclosure, transparency, accountability, and shareholder participation. For instance, proposals are being made to publish the packages and salaries of chief executive officers in a move designed to curb self-dealing and to promote equity. A Draft Securities Bill is under consideration. Efforts are also underway to harmonise listing laws in the 14-member Southern Africa Development Community (SADC) in order to facilitate dual listing.

Portfolio investment is not the only medium for foreign investment. Notwithstanding restrictions on foreign investment of the stock market, the Zimbabwe Investment Centre (ZIC) regulations permit 100% new foreign direct investment in priority areas such as manufacturing, mining and tourism. Investment in construction enterprises is limited to 70% external shareholding. Foreign investment participation in reserved sectors such as agriculture, transport and retail is limited to 35% and can only be undertaken through a joint venture with a local partner. In all cases investment into existing companies other than through the stock exchange is approved by the Exchange Control Department. Foreign owned companies can borrow any amount for working capital on the local market. Capital projects can only be funded from inward remittances or through retained earnings. All companies, whether foreign owned or domestic can borrow offshore through a commercial bank. Loans above US$ 5 million require approval of the External Loans Coordinating Committee (ELCO).

Government Securities

In 1925 government put forward the first local stock issue of £1 million 5% Southern Rhodesia Local Registered Stock 1945-55 at £99 repayable in Southern Rhodesia. The regular issue of Treasury Bills, first issued in 1952 according to Harvey (1996, p3) was relaunched in September 1957. The exercise enabled banks to comply with prescribed liquid asset ratios.

A consolidated sinking fund was established in 1948 in both London and Harare permitting the National Debt Trustees to retire any stock issue at their discretion, states Newlyn and Rowan (1954, p149). The objective was to enable a gradual redemption of government securities. Trustees regularly furnished stockbrokers with a list of indicative prices at which stocks could be redeemed. In fact the Trustees laid down the interest rate structure for medium and long-term securities and there were no other ready cash buyers for government securities. The Standard Bank acted as an agent of the Trustees up to 1959 when this function was taken over by the newly established central bank. From 1962, price list issued in the name of the Reserve Bank were partly influenced by a desire to smoothen prices of government stocks and maturities in the UK. Sowelem (1967, p170) highlights that the central bank came with greater financial

139

capacity than the sinking funds to deal with government securities on its own account. In early days, Treasury Bills were issued in excess of government requirements to support the emergence of a functional money market. The central bank was able to buy excess securities offered until the market needed them.

Although the central bank was able to maintain reasonable liquidity of government fixed income securities, it failed to stimulate the interest of ordinary investors apart from large mining companies and insurance companies. The market for medium and long-term government securities remained weak. However, authorities were able to have an indirect source of funds from captive markets such discount houses, the POSB, pension funds, and other financial institutions susceptible to regulatory minimum liquid assets requirements and moral suasion. To date there is no well developed secondary market in government securities because interest rates were in the past administered. Despite formalised liquidity requirements for holding government paper, there are no formalised secondary market arrangements for trading government stocks.

4.3 The Changing Landscape

In all progressive countries access to financial services is now considered a basic necessity. The Zimbabwean financial infrastructure continues to evolve over time, spurred on by global integration, technological progress, competition, and commercial viability. Although banks, money and finance are not a creation of modernity, they continue to evolve with time as society becomes more informed and articulate in its preferences. Zimbabwe joined the IMF on 29 September 1980 and has in her own small ways strove to keep pace with important financial developments in the international community. The cause for further financial liberalisation and the design of appropriate financial safety nets to suit Zimbabwe's circumstances remains very strong at the time of writing.

In general government has adopted an incremental or gradual approach to financial liberalisation in Zimbabwe. In positive light, this approach gives institutions and individuals enough time to learn. According to the rational expectations proposition, economic agents are likely to commit investments under a regime of reforms they expect to be sustained. However, timid reforms render

commitment to far reaching changes questionable. The gradual liberalisation process can easily loose momentum if the economy is faced with more urgent pressures. In any case, if the roots of financial liberalisation are shallow the opportunity cost of retrogression is low in the short term (but high in the long term considering damage to reputation and trust). Wavering economic polices make it difficult to assess the true impact policy decisions.

A number of market-based reforms introduced in 1993/4 were reversed since the economic crisis beginning in 1997. For instance, government sometimes confiscate corporate deposits in foreign currency denominated accounts (FCAs) to supplement dwindling official foreign exchange reserves. The IMF (2001, p18) estimates that usable foreign reserves were less than U$50 million, or one-week import cover at the end of 1999. Following the massive one-day currency crush by 75% on 14 November 1997 market determined exchange rates were purged. From January 1999, the exchange rate was pegged at Z$38 to the US dollar but was devalued to Z$50 per US dollar on 1 August 2000. The rate rapidly depreciated to Z$55 and was pegged there throughout 2001.

According to the IMF the economic crisis was sparked by low investor confidence following unbudgeted payments of War Veterans gratuities in 1997, reimposition of price controls, military intervention in the Democratic Republic of Congo (DRC) in 1998, and uncertainty on the direction of land reform.

The high cost of borrowing in 2000 was also a burden to government, which was increasing dependent on domestic borrowing following the evaporation of international funds. In January 2001, the Reserve Bank cut money market interest rates by fiat to below 20% at a time when inflation was hoovering around 85%. This policy magnified negative returns on deposits. Some innovative banks were able to increase fee-based income in addition to offering compulsory services such insurance on bank loans and credit cards. It is not clear whether such schemes have the capacity to halt systemic and moral hazard risks. The ability to transfer risk partially explains the persistence of bank profitability when all sectors of the economy are collapsing. The persistence of financial repression alongside with innovative continuity and globalisation suggests Zimbabwe has not yet escaped the tyranny of contradictory development.

The years 1999 to 2001 were, however, very important for financial system safety and soundness. Until then, the banking regulatory framework in Zimbabwe was very weak because it had no support of law. Authorities have now put in place three important pieces of legislation. The Reserve Bank Act [Chapter 22:15], details of which have already been discussed under the subsection on the Reserve Bank, became effective in August 1999. The new Act has strengthened the bank's supervisory role, which was not adequately dealt with in the 1956 and 1964 Reserve Bank Acts as amended over the years. In brief there still is room to clarify the policy objectives of the central bank. In future, the question of central bank independence might require further elaboration.

The long awaited Banking Act [Chapter 24:20], whose numerous drafts were debated since the early 1990s, became effective on 1 August 2000. Contrary to Reserve Bank expectations, the responsibility to license and cancel bank licences is still vested with the Registrar of Banking Institutions under the Ministry of Finance. It was hoped the capacity to withdraw licences would be a useful tool if it were transferred to the supervisory authority. As Claridge and Box (2000, p68) put it, "the jurisdiction of decision-making should correspond to the jurisdiction of effects and costs." In other words, "People who make decisions should be those who receive benefits and bear costs" (Ibid). Earlier on it was noted that the Reserve Bank solely bears the costs incurred in pursuit price stability and soundness of the financial system. However, the law, that is, section 12 of the Banking Act, makes annual fees payable by all registered institutions remittable to the Registrar of Banking Institutions.

This said, the Act provides for the Registrar to consult Banking Supervision on licensing matters. Section 5 of the new Act does away with contradictory references to registration of persons as "banks" contained in section 5 of the previous Act [Chapter 188]. The Reserve Bank, through the Banking Supervision Department, is now empowered to conduct pre-opening inspections on all newly licensed institutions. Banking Supervision is required by law, section 45 of the Bank Act, to "continuously" conduct off-site and on-site examinations on all banking institutions to ensure compliance with the Act. The Act also provides for the joint issue of banking regulations by the Registrar and the Reserve Bank.

Banking Supervision may recommend remedial action to the Registrar. The Reserve Bank is responsible for managing institutions in financial distress.

Financial theory and experience have taught us that despite the best efforts by the authorities to competently license, regulate and supervise banks, the potential for financial distress is inevitable. To paraphrase Lewis (1995, pxiv) the fragility of banks stems from the truism: Liabilities are liquid: Assets are risky. The promulgation of the Troubled and Insolvent Banks Policy of 2001 clarifies the Reserve Bank's public interpretation of its lender of last resort function. The central bank reiterates that liquidity support will only be available to solvent banks that can demonstrate viability. Weak banks shall be required to merge or consolidate with a financially health institution. Insolvent entities will be allowed to fail. Existing banking laws and regulations provide for progressively harsher "Corrective Actions" and "Orders" which may culminate in mandatory closure and liquidation of insolvent or imminently insolvent institutions that cannot be recapitalised within stipulated time limits.

Adoption of a standard framework for managing problem banks promotes a fair, transparent, consistent and firm regulatory response to various degrees of financial distress. The policy enables early identification of potential problems and prompt responses to correct deficiencies. Corrective Orders will be tailored according to the institutions' overall risk profile. A banking institution's overall risk profile, as characterised by its performance on the individual components of the CAMELS[1] standardized rating system, determines its composite rating and the degree of supervisory concern.

It is hoped that the policy will rid Zimbabwe of what Kane and Rice (2000, p5) characterise as "zombie banks" which are, "Insolvent banks that enjoy such an unnatural prolongation of their existence" "after its ownership capital has departed" due official indecisiveness. I cannot overemphasise De Juan's (1991) very influential paper: Does Bank Insolvency Matter? The paper forcefully articulates that insolvent banks, whether financially ruined by micro issues such as mismanagement, ineffective supervision, political influence or are in a position to fraudulently declare profits and pay taxes for that matter, result in

[1] Acronym for Capital Adequacy, Asset Quality, Management, Earnings, Liquidity, and Sensitivity uniform bank rating system developed in the United States. The system is widely used throughout the world by Banking Supervision authorities or agencies.

misallocation of resources at a macro level "that will ultimately materialise as fiscal deficit," (p1)

Nowadays effective banking supervision is regarded as an essential financial safety net required to bolster financial stability. For banking supervision to be effective, there is need for adequate capacity in terms of competence, skills and expertise to analyse financial products and data, monitor early warning signs potential problems, and initiate adequate corrective responses to problems. Montes (1998) has attributes the 1998 East Asian crises to weaknesses in the financial system caused by the "twin liberalisations" of the financial sector and the current account in less developed countries. According to him bank failures occur within two to five years if liberalisation is not accompanied by development of a sound banking system. Delhaise (1998) concurs that the East Asian financial crisis was inevitable due to fundamental weaknesses.

Capacity building has been a permanent feature in every Banking Supervision Annual Report since 1996. However, the department continues to lose staff to the regulated institutions at a high rate. Kane (1981) argues that Bank Examiners preoccupied by post-regulation career prospects will act in self-interest to the detriment of effective prudential supervision. In extreme cases regulatory capture may occur where discriminatory regulations benefit the politically powerful institutions and customers. Given the value of its core functions, Banking Supervision should strive to reduce staff turnover and retain the best skills it can muster. Elsewhere supervision is increasingly becoming a knowledge-based profession in order to keep abreast with constant innovation.

Financial literature strongly supports a functional approach, also known as the financial serves view, to financial design. A functional system does not support rigid demarcations between financial institutions. Hence the UK, for example, has adopted the super-regulator concept where one regulatory agency supervises all the bank and non-bank financial institutions. In Zimbabwe the official thinking is still dominated by the institutional approach, which supports separation of activities and institution specific legislation. Nevertheless, there is need for close cooperation among the various regulators of banks, building societies, insurance, pension and provident funds, collective investment schemes, micro finance and unit trusts.

Despite numerous regulatory authorities and over a dozen pieces of legislation loopholes still exist. Until the late 1990s, no law governed unit trusts. In the mid 1990s, a lot of people fell victim to pyramid schemes because there was no legal recourse until the Collective Investment Schemes Act became operational in August 1998. The Securities Bill, which will replace the Zimbabwe Stock Act, is not yet law. In practice it is impossible to close every regulatory loophole because economic units act in enlightened self-interest. Kane (1981, 1983) developed an insightful framework of cyclical interaction between opposing political and economic forces known as the "regulatory dialectic." The political process of regulation and the economic process of "regulatee avoidance" or "loophole mining" interact by interminably adapting to each other.

Derived from the classical presentation of the philosopher Christopher Hegel, the word dialectic refers to change occurring through a process of action and reaction by opposing forces. A dialectic process comprises of a thesis (initial set of arguments and rules), the antithesis (conflicting responses) and a synthesis (the resultant modification from interaction of opposing forces). Kane (1981) stresses that there is an endless struggle between the invisible hand of economic power and the visible hand of political power. However the innovative lags are shorter than the regulatory lags due to institutional constraints. I agree with Kane that some innovations are overlooked unless they threaten a regulatory crisis because the political system can forgive excessive delay better than ill-conceived hasty action. Regulations that are severe, discriminatory or hard to avoid result in the "politicisation of ordinary citizens," Kane (1981, p365) argues.

Nevertheless, there is need to put in place mechanisms that compel financial institutions to offer enforceable service guarantees to their customers. The current Banking Act has no provisions to empower customers against unfair practices or pricing. For instance, clients have no recourse against institutions that offer compulsory services such as unsolicited insurance. Despite the provisions of the Moneylending and Rates of Interest Act [Chapter 14:14] introduced on 1 October 1930, micro-finance institutions reputedly overcharge clients. Apart from banking supervision, no other comprehensive prudential supervision arrangements exist to guide the activities of other financial institutions.

Section 66 of the Banking Act provides for the establishment of the deposit protection scheme (DPS), details of which were still under study by a standing committee. It is too early to evaluate the proposed scheme. In theory, the success of a DPS requires support of additional financial safety nets such as effective supervision, good corporate governance, contract enforcement, good accounting standards and practices, adequate disclosure, and clauses that ameliorate against moral hazard behaviour on part of banks and depositors. Attention must also be drawn to macroeconomic conditions, state of the financial system, market discipline and the regulatory environment.

Notwithstanding the regulatory gaps, there are discernible trends toward the adoption of innovative delivery channels and products. Automated teller machines (ATMs) have been well received and understood by the market. However current usage is limited to withdrawal of funds 24 hrs a day. Further deployment of this expensive technology has been adversely affected by the foreign currency shortage on the Zimbabwean market. ATMs are also widely used in conjunction with credit cards. The recently introduced in-store banking concept has met with considerable success among the lower end individual customers and of course the business corporations hosting the banks.

Scope for use of Electronic Funds Transfer at Point of Sale (EFTPOS) and telephone banking is still hampered by backward telecommunication and information technologies. There is hardly any cash withdrawal at Point of Sale in Zimbabwe in contrast to Australia. Internet banking across nations is particularly constrained by exchange controls, the shortage of foreign currency, as well as affordability of equipment at private homes and small businesses.

Confidence and trust in the alternative technologies has not yet permeated across the entire fabric of society. A number of alternative service channels with potential to serve remote rural areas such as credit unions, community banks, third party agencies, and giro post have not yet caught the imagination of the Zimbabwean market. It seems to me both banks and clients are still obsessed with the big bank concept. Therefore increased competition among financial service providers has increased services for those already well off to the detriment of small clients. This phenomenon is evidenced by the readiness of banks to put up tenders in order to secure banking business of blue cheap

companies. Nevertheless, the regional centres and rural areas may lack the economic clout to sustain viable financial services hence the agglomeration of service providers in major urban centres.

In my view, authorities should leave no stone unturned to encourage financial innovation. In fact Merton (1990, p270) considers financial innovation to "the engine driving the financial system on its prospective journey to economic efficiency." Even small benefits to individuals aggregate into enormous social gains for the economy as a whole. In the same vein the hours lost by Zimbabweans queuing for simple financial services aggregate into enormous loss of productivity at a national level. Although Van Horne (1985) labours the point that some innovations could be mere rent seeking "fads", "balloons", and "bubbles", he agrees that true financial innovation makes the markets either more efficient or more complete by lowering intermediation costs or inconvenience costs, (p622).

5. DATA COLLECTION

5.1 Scope of indicators

[Prestige] in the econometrics profession hinges on technical expertise rather than on hard work required to collect good data.

Kennedy (1998, p2)

This section describes the sources and techniques used to construct the time series data and indicators used in this research. Empirical evidence is based on annual data over the period 1924 to 1998. In fact, this study largely creates a new database because existing primary sources of data on Zimbabwe are not systematic, consolidated or in electronic format. In practice, financial development is measured against indicators of size, activity and efficiency of financial institutions and capital markets. This approach was popularised by Beck, Demirgüç-Kunt and Levine (1999). Unfortunately, their database covers an inadequate span (1975 to 1996) and a few variables on Zimbabwe.

There is no unique indicator of financial sophistication, hence the use of an array of indicators in the financial literature. Lynch (1993, p5) proposes that a full set of financial development indicators should include measures of credit intermediation, liquidity management, risk management and pricing mecha-nisms. Lynch's paper identifies five categories of financial development namely: quantity measures, structural ratios, financial prices, product range and trans-action costs. Quantity measures include aggregates of monetisation, credit in-termediation, and financial assets, whereas structural measures indicate the relative importance of the different elements. Beck et al's (1999) choice of size, activity and efficiency indicators has a rich intuitive appeal because they clearly show the intermediary role of a broad range of financial institutions and the capital markets. Fischer et al (1998) use economic and accounting variables. Nevertheless, financial prices, product range, and transaction costs are useful indicators of the degree of financial sophistication.

148

5.2 Analysis of indicators

This research, similar to several studies on financial intermediation, adopts the Beck, Demirgüç-Kunt and Levine (1999) approach. Five different groups of financial intermediaries are identified. These are: the Reserve Bank of Zimbabwe (RBZ), which is the central bank; deposit money banks (DMB); other banking institutions (OBI); non bank financial institutions (NBFI); and development financial institutions (DFI). Deposit money banks in Zimbabwe comprise of Discount Houses, Commercial Banks, and Merchant Banks, which are also known as Accepting Houses. DMB are distinguished by acceptance of deposits that are transferable by cheques. OBI refers to Building Societies, Finance Houses, and the People's Own Savings Bank (POSB). Insurance companies, provident and pension funds constitute the non-bank financial institutions (NBFI). Development financial institutions (DFI) are made up of the Agricultural Finance Corporation (AFC) and the Zimbabwe Development Bank (ZDB).

Total assets of the respective intermediary group are used to determine the absolute and relative importance of each financial sector. The absolute size of each financial sector is obtained by expressing the relative assets to the size of the economy as denoted by the GDP. These indicators of absolute size measure the importance of financial services provided to the real sector, "including government, public enterprises and the private sector" [Beck et al (1999, p6)]. The total assets of financial intermediaries (TFA) series is a sum of the assets of the various categories of financial intermediaries. Ideally, the assets of each intermediary group are adjusted to reflect domestic intermediation of the respective category, and to net out cross claims on the financial sector. This practice was not followed in this thesis because, for the period under consideration, operations of Zimbabwean banks were largely domestic partly due to exchange control restrictions. Furthermore, Zimbabwean banks were very small by international standards and thus could ill afford engagement in cross boarder intermediation. While banks such as Standard Chartered Bank and Barclays Bank are in fact locally registered branches of foreign owned banks, for all intense and purposes their intermediary role is confined to the Zimbabwean arena. Claims on the financial sector have not been netted out due to poor disaggregated time series data before 1975.

149

Beck, Demirgüç-Kunt and Levine (1999, p8) highlight the need for proper deflation to correct for timing differences that might affect measures of absolute financial size. Financial balance sheet items are treated as stock variables, which are measured at the end of the period. On the other hand GDP is a flow variable, which is defined relative to a period. Beck et al (1999, p8) recommend the deflation of financial balance sheet items (FBI) by end of year consumer price index (CPI) while the annual CPI deflates GDP. No reliable annual CPI is available in Zimbabwe for the period under review, thus end of period CPI was used to deflate GDP. As typical in financial literature, all indictors of size and activity based on GDP as the denominator were, however, expressed as ratios of average real financial balance sheet items to real GDP. Mathematically

$$
\frac{0.5\left(\dfrac{\text{FBI}_t}{CPI_t} + \dfrac{FBI_{t-1}}{CPI_{t-1}}\right)}{\dfrac{GDP_t}{CPI_t}}
\tag{19}
$$

Henceforth all ratios refer to real ratios, unless indicated otherwise.

Traditionally, capital markets and financial intermediaries were regarded as alternative approaches to financial design. Current research emphasise their complementary role. The size or development of the stock exchange is given by the ratio of the stock market capitalisation (SMC) to GDP. Total size of the financial sector (FS) is represented by the combined contribution of financial institutions and capital markets relative to GDP. Lynch (1993, p9) correctly notes that this indicator raises the spectre of double counting as insurance companies and pension funds hold substantial securities. In this research, assets of the provident and pension funds are excluded from the calculation of the total financial sector to minimise chances of double counting of cross-financial claims.

Apart from indicators of financial sophistication based on the asset side of the balance sheet, Liquid Liabilities to GDP is considered a useful measure of the overall size of financial intermediation or financial depth. Liquid liabilities (LQL) of the financial system comprise of currency, demand deposits, and other interest-bearing liabilities of banks and non-bank financial intermediaries [Levine, Loayza and Beck (2000, p37)]. Although commonly used, LQL is not adjusted for double counting of cross-financial sector claims. Liquid liabilities do not capture the cost and informational attributes of intermediation, for instance.

Relative measures of the size of financial intermediaries are computed as the contribution of a given intermediary category to GDP. Typical ratios calculated are RBZ to TFA, DMB to TFA, etc. The relative importance of deposit money banks to the central bank (DMB to RBZ), or DMRB for short is considered an informative indicator of financial sophistication. The relative contribution of the central bank is expected to decrease with an increase in economic sophistication. This indicator has no direct linkage with other benefits of intermediation such as exerting corporate governance on enterprises, risk management, reduction in transaction costs, quantity and quality of financial services. Nevertheless, financial theory suggests that DMB have better incentives to provide better monitoring and screening services than the central banks.

Measures of financial institution activity relate credit issued to the private sector by different combinations of financial intermediaries to GDP. Common indicators are: Private Credit by Deposit Money Banks to GDP (PCDMB); Private Credit by Other Banking Institutions to GDP (PCOBI); Private Credit by Total Banking Sector to GDP (PCBK); Private Credit by Non Bank Financial Institutions (PCNBFI); Private Credit by Development Financial Institutions (PCDFI). Intuitively, total Private Sector Credit by all financial intermediaries to GDP (PSC) is a superior measure of the full extent of financial intermediation in the economy. Indeed, Beck, Demirgüç-Kunt and Levine (2001, p24) identify PSC as their indicator of choice. Other things being equal, high reliance on bank credit is associated with improved productivity on investment and eventually sustainable economic growth. The indicators discussed in this paragraph exclude credit granted to the public sector by financial intermediaries. Credit issued by the cental bank is not considered. Although some researchers, for instance Beck, Demirgüç-Kunt and Levine (1999, p7) exclude credits issued to state-owned enterprises (SOEs), I have not followed the precedent due to data limitations. However, on one hand SOEs comprise a significant share of economic activity in small economies such as Zimbabwe and provide essential services in all mixed economies. One the other hand the transactions are not at arms' length and most likely to be politically rather than economically motivated.

In order to have a meaningful impact on economic activity financial intermediaries should provide services in an efficient manner. The Campbell Committee's (1981) Final Report discussed three forms of financial system effi-

ciency: operational efficiency measures economic use of resources; allocative efficiency directs resources to areas of highest return on investment; while dynamic efficiency deals with the system's capacity to adapt to changes as well as generate innovations. In practice, financial institution efficiency is based on bank level accounting data for commercial banks. Typical indicators adopted include the net interest margin (NIM); overhead costs to total assets; real interest rates; and the spread between deposit and lending interest rates. For the stock market, measures of efficiency include stock traded value to GDP, and the turnover ratio, i.e. turnover value to market capitalisation.

5.3 Other variables considered

The principal conditioning variables applied in this research are discussed at length in Section 7.5. LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) proposed an array of legal and regulatory characteristics that determine the level of financial development across counties. In particular the legal origin, creditor and shareholder rights, contract enforcement, and accounting standards have empirically been found to be informative. The intuition behind these indicators is that sound institutional arrangements reduce the effects of transaction costs, information asymmetry, agency risk, and moral hazard behaviour. An adequate regulatory framework ameliorates the mobilisation and canalisation of financial resources to their most productive use. Insecurity diminishes the expected value of real and financial assets and undermines investor confidence.

Whereas the legal and regulatory framework is very useful in cross-country studies, some of the indicators (e.g. legal origin) are time invariant hence less informative in time series analysis based on a single country. This said, there is need to use proxies that capture the same attribute in a fashion amenable to time series analysis. This research turns to proxies documented in Alesina, Ozler, Roubini and Swagel (1996). Reliance was placed on proxies of democracy (DMO); change in government (CGV); major change in government (MCGV); and armed internal conflict (WAR)[23]. I extended the span covered by these indicators on the basis of available historical knowledge on Zimbabwe. The use of indicators itemised in this paragraph is motivated along the same lines as the legal determinants discussed in the previous paragraph.

This thesis acknowledges that informational and technological advances largely determine financial services delivery channels, the range and quality of services provided. To this end, I propose an indicator that directly measures the degree to which an economy uses informational technologies. A new proxy, computed as the logarithm of telephone lines per capita (LTECH) is derived. Hypothetically, LTECH is an appropriate indicator for dynamic efficiency in a developing economy such as Zimbabwe. Telephone banking, POS debits, Internet banking, for instance, depend on sound communication technologies.

5.4 Sources of data

The present section describes the basic sources of data gathered as part of this research. A full description of the sources is given in Appendix 4. Detailed statistical notes are avoided due to space limitations. Econometric evidence is based on transformed annual data in Table 24. Specifically, some variables are deflated to reflect real variables. Ratios of real financial balance sheet items to real GDP are expressed in natural log transformation and used to represent the variables in levels. Where appropriate, logarithms of ratios based on real financial balance sheet items have also been taken. Table 23 gives the data set in its original format. The electronic version has minimal rounding off.

5.5 Limitations

A Government Statistical Bureau was established in April 1928 but no effort has been taken to consolidate time series data into a user-friendly format. Chapman (1992, p52) emphasises, "delayed publication, lack of transparency or simple unavailability of information [as] shackling the working of the [Zimbabwe] financial system..." Statutory publications by the Central Statistic Office, The Registrar of Provident and Pension Funds, The Registrar of Insurance, and the Registrar of Banking Institutions are often delayed by a couple of years. RBZ Quarterly reviews were sometimes delayed. Although capital markets have existed in Zimbabwe for over a century, stock market data in Zimbabwe is very fragmented. Non-available and opaque financial statements increase the cost of information to firms. This affects capital allocation and economic growth.

6. RESEARCH METHODOLOGY

6.1 Introduction

The genesis of scientific inquiry and analysis is usually the observation and interrogation of manifest phenomena

Weber (1999,p101)

Vector autoregression [VAR] is a multivariate econometric process, which estimates the temporal fluctuations and dynamic interdependence among current and past realisations of variables in a time series vector up to a specified lag length. According to Schumpeter (1936, p64) economic performance depends on preceding development. King and Levine (1993) among others provide empirical support to this suggestion. Clarke (1986, p6) argues that financial structure at a given point in time is an amalgam of past "active and passive interaction" of finance and the real economy. Current development processes create "the prerequisites" for subsequent performance. This makes VAR, the principal technique applied to this research, very suitable to the task. Christ's (1966) properties of a good model encompass "relevance, simplicity, theoretical plausibility, explanatory ability, accuracy of coefficients and forecasting ability."

6.2 VAR Uses and Procedure

There are four main uses for VAR, namely (1) data description in the unit root context; (2) forecasting macroeconomic indicators; (3) policy analysis to study or infer on the sources, characteristics and persistence of economic fluctuations; and (4) testing competing theories (e.g., investigating validity, direction of causality, etc). The typical VAR steps are: model formulation, tests for stationarity (unit root tests), tests for cointegration, estimation of parameters, and analysis of the dynamic properties. Impulse response analysis, forecast error variance decomposition analysis, and forecasting are the usual post estimation evaluations in a VAR framework. For the sake of simplicity I present the theoretical VAR model before applying it to the Zimbabwean time series data.

6.3 The Analytical Framework

For as long as we are unable to put our arguments into figures, the voice of our science, although occasionally it may help dispel errors, will never be heard by practical men."

Schumpeter (1933, p12) in the first issue of Econometrica

Hamilton (2000, p25) defines a time series as "a collection of observations indexed by the date of each observation." Reinsel (1997) adds, "multivariate processes arise when several related time series processes are observed simultaneously over time instead of observing just a single series as is the univariate time series." The trend, if any, depends on unknown parameters.

Economic modelling assists policy makers and decision-makers to interpret, influence, and forecast the behaviour of variables of interest. Recent time series econometric techniques have been applied to analyse the predictive power and informational content of financial aggregates with respect to economic activity. The avalanche of authoritative seminal papers in various learned journals suggests that economic modelling has been fruitful but is far from being universally conclusive.

This study principally turns to the methodologies and models applied in Spanos, Andreou, and Syrichas (1997), Rousseau and Wachtel (1998), Lynch (1993, 1994) and Rousseau (1999) with appropriate modifications as and when necessary. Spanos et al (1997) propose a VAR perspective, in a "Probabilistic Reduction Approach" [PRA] to model relationships among macroeconomic variables. Spanos (1999, p xi) defines the probabilistic reduction approach as the empirical modelling of observational (as opposed to experimental or survey) data. As conventional, the VAR framework starts off by formally testing time series economic data for stationarity and integration properties. Cointegration among the variables is examined to identify the long run equilibrium relationships. This study applies the usual post estimation forecast error variance decomposition [VDC] and generalised impulse response function [GIRF] analyses to investigate the speed and direction of the causal relationship between financial indicators and economic growth, and the persistence of shocks over time.

6.4 The Vector Autoregressive Method

The vector autoregressive [VAR] model, also known as vector autoregressions, is a multivariate econometric process, which estimates the empirical relationship among macroeconomic variables of interest. In its purest form, the model is concerned with temporal fluctuations and dynamic interdependence in a vector of time series variables without theoretical restrictions on the parameters relating to endogeneity or exogeneity. As Amisano and Giannini (1997, p2) put it, "each series under study is regressed on a finite number of lags of all the series jointly considered."

Yule (1926) and Granger and Newbold (1974) demonstrated the need to pay particular attention to the economic content of regressions. Ferson, Sarkissian and Simin (2000) argue that despite tremendous advances in econometric literature and the use of large samples, spurious (counterfeit) regressions biases are still prevalent in financial economics. The problem is partially resolved by the use of lagged variables, which are common in VAR frameworks.

Pure VAR models however do not shed much light on model specification. Koopmans (1947, p164)[24] argues that the relevance of variables selected for a particular study depend on the underlying theory. According to Koopmans "the spirit" of empirical research "gropes" for theoretical guidance (Ibid p163). I agree with Koopmans to the extent he argues that "measurement, without theory" offers no policy guidance to the authorities (p167). In my view, the relationship between quantitative research and theory is mutually beneficial in spite of the unsettled controversy on the reciprocity of theory-data confrontations.

In a PRA the variables of interest (chosen data) are initially selected on the basis of the underlying theoretical foundation. The empirical properties and distributional features of the time series data are also taken into account. This gives rise to dynamic linear equations between a vector of variables and their past history, (Spanos et al 1997, p3). Enders (1995, p12) concurs that the identification of "the dynamic path of a series" enhances forecasting accuracy, interpretation of economic data, and hypothesis testing. Spanos (1999, p263) views the purpose of time series econometrics as to estimate information out of chance regularity exhibited in the data. Technical wizardry is not an end in itself:

The ultimate objective of empirical modelling is not just the summation of the systematic information in the data in the form of parsimonious parametric model but the use of such models to understand economic phenomena (Spanos 1999, p368).

However, Spanos does not fully address the treatment of possible multiple cointegrating VARs. Pesaran and Pesaran (1997, p437), Pesaran and Smith (1999), Garratt, Lee, Pesaran, and Shin (1999) apply "Long Run Structural Modelling" [LRSM] to identify the most appropriate equilibrium. LRSM enables the researcher to choose among competing cointegrating vectors on the basis of theoretical plausibility. Signs on the parameters of the so-called "Great Ratios", see Mills (1999) for instance, are predicted by theory. Such knowledge assists in the selection of appropriate cointegrating vectors. Structural analysis accommodates the imposition of homogenous and non-homogenous restrictions on parameters. LRSM is therefore a very valuable extension of the Johansen (1988, 1991) Maximum Likelihood cointegration analysis. In this thesis, LRSM is applied in cases where there are more than one cointegrating vectors, and in instances where there is a need to examine restrictions on statistically insignificant parameters.

6.5 Origins of VAR modelling

Watson (1994, p2844) and Spanos et al (1997, p3) agree that Christopher Sims introduced VARs to economic analysis in 1980. The building blocks were not new. In fact Spanos et al traces the introduction of the VAR concept to time series analysis to earlier work by Razonov (1967) and Hanan (1970). Stock (1994, p2744) reveals that White (1958) advocated the use of the "functional central limit theorem" (FCLT) to study "unit root" properties. Diebold (1997, p7) traces autoregressions to Slutsky (1927) and Yule (1927), and the concepts of "impulse" and "propagation" to Frisch (1933). In addition, Sargent and Sims (1977) and Geweke's (1977) dynamic factor model is related to cointegration because it is based on the idea that a large number of variables in a multivariate system could be driven by a few common trends or shocks. According to Diebold (1997, p12) Sargan (1964) introduced the error-correction concept, whose formal link with cointegration was provided by Engle and Granger (1987). Usage of the VAR models has increased tremendously since the 1980s. Stock

(1994) and Watson (1994) provide authoritative surveys of the literature. They single out Philips (1988, 1992), Diebold and Nerlove (1990), Campbell and Perron (1991), Banerjee (1992a) as some of the notable early works in the field.

To appreciate the influence exerted by VAR models on the econometric tradition one needs to briefly consider the typical conventions prior to their use. Before VAR, the macroeconomic tradition used large structural models for hypothesis testing and forecasting. Enders (1995, p5) defines a structural model as one that "expresses [an] endogenous variable as being dependent on the current realisation of [other] endogenous variables ..." On the other hand, a reduced form equation

> is one expressing the value of a variable in terms of its own lags,
> lags of other endogenous variables, current and past values of
> exogenous variables, and disturbance terms

Traditionally macro-economic models are associated with the Cowles Commission for Research in Economics founded in Chicago in 1932 by Alfred Cowles originally to investigate stock market prices (Charemza and Deadman 1992, p4). In the words of Diebold (1997, p3) the commission symbolised the "intellectual marriage of statistics and economic theory." Around the same time Frisch and Tinbergen, pioneered macro-econometric modelling in Europe, and were later jointly awarded the first Nobel Prize in Economics for their influential work (Charemza and Deadman [1992, p10]). According to Diebold (1997, p3) great talent assembled at Cowles included names such as Arrow, Debreu, Haavelmo, Klein, Koopmans, Markowitz, Modigliani and Wald. Haavelmo's influential monograph unified the different approaches in 1944 in order to provide a "bridge" between "economic theory and actual measurements..." The book classified the four problems of quantitative research as (a) construction of tentative models, (b) the testing of theories, (c) the problem of estimation, and (d) the problem of predictions. It placed emphasis on testing theories on the basis of data (p10) rather than measuring parameters without rigorous, probabilistic, statistical analysis. According to Haavelmo (1943, 1944) this is important because researchers use observational data as a proxy for actual data to evaluate equations with unknown parameters; therefore "exact" predictions are impossible.

Haavelmo (1944) could have been far ahead of his time. Spanos et al (1997, p1) point out that the econometrics profession ignored his work and continued with exactly identified structural models. Darnell and Evans (1990, p114) observe that Tinbergen's (1939) work on business cycles spearheaded the construction of large macro-economic models. According to Charemza and Deadman (1992, p10) Tinbergen built the first multi-equation structural model in 1936. It had 24 equations and was based on the Dutch economy. Charemza and Deadman document that researchers had a soft spot for enormous models. The 1965 version of the Brookings Model, for example, had 160 equations while the Brookings MARK Π model about 200 equations.

6.6 Dissatisfaction with LSM models

If I have one chicken to eat and you have none, we have on the average half a chicken each, so why are you hungry?

Kindleberger and Herrick (1977, p10)

The pedagogic value of the VAR approach is enhanced by its ability to circumvent the main limitations of the large structural macroeconomic models [LSMM]. Therefore, this subsection briefly highlights developments behind the erosion of the credibility of LSMM. Unlike the LSMM, model specifications are not implied by theory under the VAR methodology. VAR models are more parsimonious than LSMM. The unrestricted VAR model is simple and general.

The Lucas Critique (1976) challenged the time-honoured assumptions about endogeneity and exogeneity among variables in LSMM. Sargent (1999, p15) points out that before the Lucas Critique LSMM were "being refined to enhance their fits to historical data and forecasting ability." Lucas argued that in an environment of policy intervention, good forecasts did not support the fundamental assumption of time invariance. In effect, consistent adjustment to intercepts of important equations disguised the problem of drifting coefficients. The intertemporal parameter drift highlighted the instability of macroeconomic relationships. Lucas' critique resulted in the increased use of rational expectations models, which took into account decisions made by economic units. Static neo-

classical models assume that economic agents have no memory, and under the adaptive expectation hypothesis they only learn from the past. The rational expectations hypothesis incorporates all relevant information available.

Empirical evidence suggested that sophisticated structural models failed to yield superior forecasting results compared to the Box-Jenkins ARIMA models. VAR models take into account the intertemporal properties of parameters. Granger (1969, 1988) and Sims (1972) paid particular attention to the nature and direction of causality in multivariate systems. Their techniques aid predictions about causality in VAR models. In Granger causality the cause comes before the effect and is not the same as correlation. The effect contains information about the cause, and the future cannot cause the past. Granger causality is also useful for forecasting. Lütkepohl (1991, p55) identifies "potential incompleteness" as the major limitation of Granger- causality. As in any other model, effects of omitted variables and measurement errors are taken as innovations.

Sims (1980) challenged the LSMM's "incredible identification restrictions" and their disregard of temporal dependence and the "problem of feedback." Quoting extensively from Tinbergen (1944), Charemza and Deadman (1992, pp6-8) document that traditional approaches necessitated the need to know exact relation and exact factors. Parameters (regression coefficients) were considered to be invariant in time and structurally (movements in variables). The "causal ordering", i.e. cause - effect, was known in advance. This implies there is prior information regarding the exogenous and endogenous variables. In a pure VAR framework, there are no arbitrary lag patterns or normalization equations. Charemza and Deadman highlight that the unrestricted VAR model, "does not specify contemporaneous variables that require further ex-ante predictions."

Garratt, Lee, Pesaran and Shin (1999) argue that the classic unit root studies pioneered by Nelson and Plosser (1982) "resurrected the spectre of spurious regression" in financial economics. Presence of unit roots in time series data raised serious problems on the validity of LSMM in the long run. Diebold F. X. (1997) argues that LSMM rose and declined with Keynesian macroeconomic theory because of their strong dependence on theory.

VAR models are not the only successors to the territory left by the declining influence of LSMM. The Dynamic Stochastic General Equilibrium (DSGE) models were developed to incorporate issues raised by the Lucas Critique (1976). Briefly DSGE models are fully specified, that is, they take into account all information concerning tastes and technology impacting on economic units as they optimise their decisions.[v] The DSGE does not resolve the tendency for LSMM to be extremely large. Diebold (1997, p15) argues that "the 'new' theory is neither new nor radical; rather ... neoclassical" in emphasis. Garratt et al (1999, p10) support that conclusion and point out that the approach is "potentially restrictive", with its proponents biased against the monetary sector and in favour of real shocks. Such bias is undesirable for the purpose of my thesis that envisages a positive role for financial intermediation. Both Garratt et al (1999, p8) and Diebold (1997, p17) concur on the point that VAR models can approximate DSGE models. In fact Garratt et al (1999, p7) insist that VAR models are used "as benchmarks for evaluation of [LSMM] and DSGE models."

6.7 Basic Concepts of VAR analysis

(a) Types of VAR models

There are a number of versions for VAR models such as unrestricted, Bayesian, structural, and cointegrated VARs. I find Lütkepohl (1991) a very valuable early introductory text on the VAR literature. Unrestricted VARs make use of all available information without paying any attention to theoretical restrictions. In theory all variables are put on the same footing and treated as endogenous. In practice the use of causal procedures such as the Choleski decomposition adopted by Sims (1980) makes the model sensitive to initial ordering of the variables. There might be need to fallback on theory whose "incredible" restrictions the VAR model was ironically developed to circumvent. Koop, Pesaran and Potter (1996) and Pesaran and Shin (1998) developed a Generalised Impulse Response (GIR) function to generate a general result that is invariant to the order of the variables. However economic interpretation of the

[v] Keen readers are referred to Diebold (1998), Garratt, Lee, Pesaran and Shin (1999) and collected works by Cooley T F. (Ed) "Frontiers of Business Cycle research", Princeton: Princeton University Press.

shocks is difficult and controversial. Bayesian VARs [BVAR] permits the efficient use of prior information by allowing the researcher to incorporate other known facts about the system under consideration. Structural VARs [SVAR] have a stronger theoretical foundation. They supplement statistical information with theory-based restrictions on long run impulses and the covariance matrix. In structural cointegrating VAR models, popularised by Garratt et al (1999) for instance, the restrictions on long run relationship, trends and intercepts are more explicit. In practice the specific requirements may be difficult to identify.

(b) Stationarity

The spectre of spurious regression among trended time series data has made stationarity an important issue in multivariate systems. Intuitively, if two variables trend upward over time, one could find a significant correlation between them albeit devoid of any logical economic explanation. A process is stationary if its innovations are not predictable from past history. Stationarity washes out dependence among past observation of the same variable across time. In Stock's (1994, p2748) terminology stationarity implies existence of "sufficiently many moments." It is a well-known mathematical fact that a stochastic process is stationary if its first and second moments are time invariant. Strict stationarity however implies that the joint probability distribution at any point in time does not change. Reference to stationarity in this thesis refers to weak stationarity, which is concerned with the stability of a series' means, variances and covariances. Stationarity is taken seriously in the cointegrating VAR literature as it poses serious challenges to theoretical (long run) relations in time series data.

(c) Assumptions

Judge *et al* (1988, p754) indicate that a vector stochastic process is stationary if

(i)   All random vectors have the same mean vector µ, $E(Y_t) = \mu$, for all t.

(ii)   All variables involved have finite variances, $Var(Y_t)$, for all t.

(iii)   The covariance matrix, $Cov[Y_t, Y_{t+k}] = E[(Y_t - \mu)(Y_{t+k} - \mu)'] = \Omega$ does not depend on time (t) but on the lag length for all t. No trends, seasonal patterns, or time varying variances are permitted.

(iv)   The characteristic roots lie outside the complex unit root circle.

The last property, (iv), begs for technical elaboration to appreciate its meaning. Stationarily of a dynamic system requires all roots of its characteristic equation to lie outside the complex unit circle. See Appendix 2 for details. If all the roots are non-zero the matrix is non-singular or invertible. By contrast when we are considering the eigenvalues, (and the autoregressive polynomial) stationarity is attained if all eigenvalues have a modulus less than one. As Lütkepohl (1991, p456) put it, stationarity implies all eigenvalues have modulus less than 1, and the polynomial $\det(I - M)$ has no roots in and on the complex unit circle. If all the eigenvalues of the coefficient matrix M have modulus less than 1 the VAR(p) process is stable. The stationarity property is important to the invertibility of autoregressive processes. In general references to unit roots in the time series literature is confined to autoregressive unit roots discussed below.

(d) Innovation processes and unit roots

Most researchers, for instance Maddala and Kim (1998, p3), acknowledge that the unit root literature has revolutionalized the conduct of time series analysis. The new approaches criticise the traditional methods for washing away important information contained in common trends by detrending and differencing the data. Traditional methods are further accused of concentrating on "short run dynamics" at the expense of theoretical relations only valid in the long run. Presence of nonstationarity could invalidate supposed common trends among variables and by implication results in spurious regression. Spanos et al (1997, p35) argues, "the time invariance of the statistical parameters of a VAR model are an essential prerequisite for reliable statistical inference..." Orcutt (1948), cited in Stock (1948, p2740) found first order serial correlations in USA annual time series data and prompted other researchers to use first differences. By current conventions, differencing is no longer acceptable because we have noted that it removes important information from the series. Testing for unit roots is an important preliminary step in time series analysis because Nelson and Plosser's (1982) oft cited formal tests for unit roots in a Dickey and Fuller methodology has provided a solid foundation to unit root analysis.

The unit root test has become one of the most popular tests for stationarity. Formal unit root tests help shed light on whether shocks on economic variables have permanent or transitory effects which information is useful for policy design and economic analysis. The unit root phenomenon is easier to introduce in a univariate autoregressive process. An autoregressive process includes lags of the endogenous variables as explanatory variables. Supposing Y_t is a time series process; a typical autoregressive model, $AR(1)$, with order or lag 1 for simplicity, is mathematically given by:

$$Y_t = \mu + \beta Y_{t-1} + \xi_t \tag{1}$$

Where Y_t is a univariate time series denoted by a sum of a constant mean, μ; and the weighted sum of its own past up to a specified lag in the model; and the history of the innovation process ξ_t with zero mean and constant variance. More compactly equation 1 is expressed as

$$y_t = \beta y_{t-1} + \xi_t \tag{2}$$

Where y_t is defined as $Y - \mu$. The size of the autoregressive parameter β determines properties of the series. If the parameter is less than 1, the process is stationary in levels or mean reverting and is said to have a general order of integration of zero, I (0), for short. A series has an autoregressive unit root if the autoregressive parameter is equal to 1. Such a process is nonstationary and its order of integration is one I(1). The order of integration refers to the number of times a series has to be differenced to render it stationary. Processes whose order of integration is 1 or greater are nonstationary. In presence of unit roots the time series has a long memory because innovations or shocks produce permanent effects on the process.

(e) Testing for unit roots

The standard procedure for formally testing time series economic data in a VAR framework starts off by testing for stationarity and integration properties of the series. Hence the properties of the individual series will be assessed. As noted before the formal identification of the correct order of integration of each economic variable in a model is a plausible starting point for VAR and cointegration analysis. The practice takes care of possible spurious regression that

might arise from modelling variables at different degrees of integration. Most formal unit root tests propose nonstationarity, that is, they hypothesise existence of a unit root, as the null hypothesis. Considering equation 2 the null hypothesis of a unit root is tested i.e. H_0: $\beta = 1$ against the alternative hypothesis of a stationary root H_1: $|\beta| < 1$. Rejection of the unit root hypothesis implies the series is stationary. Dickey and Fuller (1979) demonstrated that asymptotic normality could not be assumed on a series with unit roots because it is nonstationary. Verbeek (2000, p238) notes that under a nonstationary null hypothesis the distribution of critical values is skewed to the right. Therefore conventional t-ratios cannot be used as they lead to over rejection of the unit root hypothesis.

Estimate $\Delta y_t = a_0 + \gamma y_{t-1} + a_1 t + \sum \beta_i \Delta y_{t-i} + \xi_t$

Is $\gamma = 0$? — No → STOP: Conclude no unit root.

Yes: Test for the presence of the trend.

Is $a_1 = 0$ given $\gamma = 0$? — No → Is $\gamma = 0$ using normal distribution? — No → STOP: Conclude no unit root.

Is $\gamma = 0$ using normal distribution? — Yes → Conclude (y_t) has a unit root.

Yes ↓

Estimate $\Delta y_t = a_0 + \gamma y_{t-1} + \sum \beta_i \Delta y_{t-i} + \xi_t$ Is $\gamma = 0$? — No → STOP: Conclude no unit root.

Yes: Test for the presence of the drift.

Is $a_0 = 0$ given $\gamma = 0$? — No → Is $\gamma = 0$ using normal distribution? — No → STOP: Conclude no unit root.

Is $\gamma = 0$ using normal distribution? — Yes → Conclude (y_t) has a unit root.

Yes ↓

Estimate $\Delta y_t = \gamma y_{t-1} + \sum \beta_i \Delta y_{t-i} + \xi_t$ Is $\gamma = 0$? — No → Conclude no unit root.

Yes → Conclude (y_t) has a unit root.

Figure 6   A Procedure to test for unit roots.

By convention and for analytical convenience the literature, as exemplified by Verbeek (2000, p238), expresses equation 2 in first difference form.

$$\Delta y_t = (\beta - 1)y_{t-1} + \xi_t \tag{3}$$

The noticeable effect of this linear transformation is to change the null hypothesis being tested to H_0: $\gamma = 0$, where $\gamma = (\beta - 1)$. The $AR(1)$ model in equation 3 can be extended to include an intercept (a_0), a deterministic trend $(a_1 t)$ and higher order autoregressive components $(\sum \beta_i \Delta y_{t-i})$ as given on top of Figure 6 above. In Figure 6 above, the determination of unit roots is shown to be sensitive to the presence of intercepts and trends. If the first order autoregressive parameter γ is not zero (0) the process is deemed stationary, that is there is no unit root. However, as illustrated in diagram 6 existence of a unit root requires further investigation because it may be attributed to other factors such as the deterministic trend.

Verbeek (2000, p239) notes "the null hypothesis of a unit root also implies that the intercept term [a_0 in our case] should be zero." Therefore a joint null hypothesis can be formulated as H_0: $a_0 = 0$, $\gamma = 0$. However, Spanos et al (1997, p38) dispute the validity of "a joint parametric test" of $\beta = 1$ and $a_1 t = 0$ because such a model does not permit the discrimination of the difference stationary from the trend stationary characteristics.

6.8 Preliminary data analysis

Most data analysis in this thesis is based on the Microfit econometric package developed by Pesaran and Pesaran (1997). The unit root tests performed are based on the Dickey-Fuller (DF) and the Augmented Dickey-Fuller (ADF) tests, i.e. equations 4 and 5 below. The equations are preset in Microfit.

$$\Delta y_t = a_o + a_1 t + \beta y_{t-1} + \xi_t \tag{4}$$

$$\Delta y_t = a_o + a_1 t + \beta y_{t-1} + \sum_{i=1}^{p} \gamma_i \Delta y_{t-1} + \xi_t \tag{5}$$

Where $\Delta y_t = y_t - y_{t-1}$, α and β are parameters which provide for a mean, trend and drift, while ρ is the unknown root or lag length of the series.

The appropriate lag length (ρ) is not known in advance and there is no guidance from economic theory. Fortunately Microfit automatically provides alternative model selection criteria, based on Akaike Information Criteria (AIC); Schwartz Bayesian Criterion (SBC); and Hannan-Quinn Criteria, to assist in the assessment of the correct order of integration of each variable. Following Pesaran and Pesaran (1997, p212), "The model with the highest value for the information criteria is selected." In case of conflict the order of integration with the most common results is selected. In tests where no common result emerged I followed the SBC. Pesaran and Smith (1999, p75) follow a similar rule.

Table 8 illustrates the application of this procedure. In Panel A the ADF regressions include an intercept but not a trend. In Panel B the equations incorporate both an intercept and a linear trend. Annual data, expressed in logs of ratios of Liquid Liabilities (LQL) to GDP for the period 1924 to 1998 is used. Full data descriptions are given in Section 7. However, in Table 8, I have chosen a lag of 5, therefore the data before 1930 is treated as a presample period.

Table 8

Unit root tests for variable liquid liabilities (LQL

Panel A: The Dickey-Fuller regressions include an intercept but not a trend					
69 observations used in the estimation of all ADF regressions. Sample period from 1930 to 1998					
	Test Statistic	LL	AIC	SBC	HQC
DF	-2.5110	60.9776	58.9776	56.7434	58.0912	I(0)
ADF(1)	-2.6330	61.5566	58.5566	55.2054	57.2271
ADF(2)	-2.7376	61.9769	57.9769	53.5087	56.2043
ADF(3)	-2.8228	62.2730	57.2730	51.6878	55.0572
ADF(4)	-2.5340	62.4641	56.4641	49.7618	53.8051
ADF(5)	-2.5179	62.4948	55.4948	47.6754	52.3926

95% critical value for the augmented Dickey-Fuller statistic = -2.9035
LL = Maximized log-likelihood   AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion   HQC = Hannan-Quinn Criterion

Panel B: The Dickey-Fuller regressions include an intercept and a linear trend					
69 observations used in the estimation of all ADF regressions. Sample period from 1930 to 1998					
	Test Statistic	LL	AIC	SBC	HQC
DF	-2.8073	62.6634	59.6634	56.3123	58.3339	I(0)
ADF(1)	-2.8798	63.0410	59.0410	54.5728	57.2683

ADF(2)	-2.9308	63.2733	58.2733	52.6881	56.0575
ADF(3)	-2.9741	63.4609	57.4609	50.7586	54.8019
ADF(4)	-2.6450	63.8059	56.8059	48.9865	53.7036
ADF(5)	-2.6252	63.8350	55.8350	46.8986	52.2897

95% critical value for the augmented Dickey-Fuller statistic = -3.4749
LL = Maximized log-likelihood   AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion   HQC = Hannan-Quinn Criterion

In both panels the model selection criteria suggests $p = 0$, that is the order of integration for variable LQL is I(0). The absolute values of the respective ADF test statistics, that is 2.5110 in Panel A and 2.8073 in Panel B, are below their 95 % critical values given at the bottom of the panels. Therefore, from a statistical point of view, the hypothesis that variable LQL has a unit root cannot be rejected. Notwithstanding this I follow the counsel from the model selection criteria and treat LQL as a I(0) variable.

Theoretically both the VAR and ADF models demand a careful selection of the order of integration. Therefore I performed rigorous tests for unit roots for each variable over three (3) to seven (7) lags consecutively. However, the larger the lag (p) for the same sample sizes the lower the power of the tests. The well-known size-power trade off makes the selection of an appropriate lag crucial. Tables 9 and 10 below provide a summary of the results of the unit root tests for various financial and economic aggregates investigated in this study. The procedure outlined in Table 8 was followed to determine the lag length.

It must be appreciated that there is no universally agreed framework for determining the appropriate lag length. Spanos et al (1997, p41) argue that ADF tests are preoccupied with autocorrelation at the expense of "other tests such as Normality, linearity, homoskedasticity, and parameter stability." Structural breaks are not taken into account. Other researchers go around this problem by using a "panel" of tests. The various unit root tests often produce mixed results. In the literature ADF tests are frequently used in collaboration with the Philips-Perron (PP) tests. I have not followed this convention because Mc Aleer and Oxley (1998, p928) suggest that the PP test in Microfit "are incorrect, [and] should not be considered as a Philips-Perron-*type* test. No critical values are provided for this Philips-Perron-*type* test, which differs from the original Philips-Perron test..." Thus, in my view, conventions should not be followed blindly.

Computational errors creep even into respected journals. Lovell and Selover (1994, pp 713-4) draw our attention to a study by Dewald, Thursby and

Anderson (1986) who demonstrated many results published in the *Journal of Money, Credit and Banking* could not be replicated. Dewald, et al found "that only 15% of 154 authors" are able to furnish their original data sets. And "nine out of eleven articles contained non-reproducible results."

Table 9

Unit root tests for various financial aggregates

Variable type	Lag	Series	Bka	Rbza	Dmba	obia	Dmrb	CIC"	TFA	LQL	RBZ	DMB	OBI	NBFI	DFI	PCDMB	PCOBI	PCBK	PCNBFI	PCDFI
dfl ratios	lag 3	Int. no trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(2)	I(2)*	I(3)	I(1)*	I(2)	I(1)	I(1)	I(3)*
		Int. & trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)	I(2)*	I(0)	I(0)	I(1)	I(2)	I(2)*	I(3)	I(1)*	I(2)	I(1)	I(1)*	I(3)*
	lag 4	Int. no trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(2)	I(2)*	I(2)*	I(1)*	I(2)	I(1)	I(1)	I(3)*
		Int. & trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)	I(2)*	I(0)	I(0)	I(1)	I(2)	I(2)*	I(2)"	I(1)*	I(2)	I(1)	I(1)*	I(3)*
	lag 5	Int. no trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(2)*	I(2)	I(1)*	I(2)	I(1)	I(1)	I(3)*
		Int. & trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)	I(0)"	I(0)	I(0)	I(1)	I(5)	I(2)*	I(1)*	I(1)*	I(2)	I(1)	I(1)*	I(3)*
	lag 6	Int. no trend	I(1)	I(0)	I(1)	I(2)*	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)"	I(6)	I(6)	I(1)*	I(2)	I(1)	I(1)	I(3)*
		Int. & trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(6)	I(6)	I(1)	I(2)	I(1)	I(1)*	I(3)*
	lag 7	Int. no trend	I(1)	I(0)	I(1)	I(2)*	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(2)	I(0)	I(2)*	I(1)*	I(2)	I(0)	I(0)	I(3)*
		Int. & trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(2)	I(0)	I(1)*	I(1)	I(2)	I(0)	I(0)	I(3)*
log ratios	lag 3	Int. no trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)"	I(0)	I(0)	I(0)	I(1)	I(1)#	I(2)*	I(2)*	I(0)#	I(1)	I(0)	I(1)	I(3)*
		Int. & trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(3)	I(0)	I(0)	I(0)	I(1)	I(1)	I(2)*	I(0)	I(0)	I(1)	I(0)	I(1)*	I(3)*
	lag 4	Int. no trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)"	I(0)	I(0)	I(0)	I(1)	I(1)	I(2)*	I(0)	I(0)	I(2)	I(0)	I(1)	I(3)*
		Int. & trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)"	I(2)	I(0)	I(0)	I(1)	I(1)	I(2)*	I(0)	I(0)	I(1)	I(0)	I(1)*	I(3)*
	lag 5	Int. no trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)"	I(0)	I(0)	I(0)	I(1)	I(1)*	I(2)*	I(3)	I(0)	I(1)	I(0)*	I(1)	I(2)
		Int. & trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)"	I(2)	I(0)	I(0)	I(1)	I(1)	I(2)*	I(0)	I(0)	I(1)	I(0)	I(1)*	I(4)*
	lag 6	Int. no trend	I(1)	I(0)	I(1)	I(2)*	I(0)	I(0)"	I(0)	I(0)	I(0)	I(1)	I(1)*	I(2)	I(6)*	I(0)	I(1)	I(0)	I(1)	I(3)
		Int. & trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)"	I(2)	I(0)	I(0)	I(1)	I(1)	I(2)	I(6)*	I(0)	I(1)	I(0)	I(1)	I(6)
	lag 7	Int. no trend	I(1)	I(0)	I(1)	I(2)*	I(0)	I(2)	I(0)	I(0)	I(0)	I(0)	I(1)	I(0)	I(2)*	I(0)	I(1)	I(0)	I(1)	I(2)
		Int. & trend	I(1)	I(0)	I(1)	I(2)	I(0)	I(0)"	I(0)	I(0)	I(0)	I(0)	I(1)	I(0)	I(0)	I(0)	I(1)	I(0)	I(1)	I(2)

Notes

Original data was transformed into fully deflated ratios and log ratios. I(ρ) denote the order of integration. Tests for unit roots for each variable were performed over three (3) to seven (7) lags consecutively because VAR and cointegration depend on the selection of an appropriate lag. In tests where the information criteria gave conflicting results I chose the most common result was selected. In cases where no common result emerged I followed the SBC. The order of integration, I(ρ), may change with the lag length. Higher lag orders reduce the power of the tests as well as the useful sample size. The asterisks * denote rejection at 5 % critical value.

Table 10

Unit root tests for various economic aggregates

Variable type	Lag	Series	PCNBFI	PCDFI	G	OPEN	GYN	GY	PCY	GPCY	LGY	LPCY	LGPCY	RPI	RVI	CAB	FSB
dfl ratios	Lag 3	Int. no trend	I(1)	I(3)*	I(2)*	I(1)	I(1)*	I(0)*	I(0)	I(0)*	I(3)	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
		Int. & trend	I(1)*	I(3)*	I(2)	I(1)*	I(1)*	I(3)*	I(0)	I(0)*	I(3)	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
	Lag 4	Int. no trend	I(1)	I(3)*	I(2)*	I(1)	I(1)*	I(0)*	I(0)	I(0)*	I(0)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
		Int. & trend	I(1)*	I(3)*	I(2)	I(1)*	I(1)*	I(0)*	I(3)	I(3)*	I(3)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
	Lag 5	Int. no trend	I(1)	I(3)*	I(2)*	I(1)	I(1)*	I(0)*	I(0)	I(0)*	I(3)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
		Int. & trend	I(1)*	I(3)*	I(2)	I(1)*	I(1)*	I(0)*	I(3)*	I(0)*	I(3)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
	Lag 6	Int. no trend	I(1)	I(3)*	I(2)*	I(1)	I(1)*	I(0)*	I(0)	I(0)*	I(3)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
		Int. & trend	I(1)*	I(3)*	I(2)	I(1)*	I(1)*	I(3)*	I(0)	I(0)*	I(3)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
	Lag 7	Int. no trend	I(0)	I(3)*	I(2)*	I(1)	I(1)*	I(0)	I(1)	I(0)*	I(0)	I(0)*	I(0)*	I(0)	I(3)	I(0)	I(0)*
		Int. & trend	I(0)	I(3)*	I(2)*	I(1)*	I(1)*	I(0)	I(3)	I(0)*	I(0)	I(0)*	I(0)*	I(0)	I(3)	I(0)	I(0)*
log ratios	Lag 3	Int. no trend	I(1)	I(3)*	I(1)*	I(0)	I(1)*	I(0)*	I(0)	I(0)*	I(3)	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
		Int. & trend	I(1)*	I(3)*	I(0)*	I(0)	I(1)*	I(3)*	I(0)	I(0)*	I(3)	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
	Lag 4	Int. no trend	I(1)	I(3)*	I(0)*	I(0)	I(1)*	I(0)*	I(0)	I(0)*	I(0)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
		Int. & trend	I(1)*	I(3)*	I(0)*	I(0)	I(1)*	I(0)*	I(3)	I(3)*	I(3)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
	Lag 5	Int. no trend	I(1)	I(2)	I(0)*	I(0)	I(1)*	I(0)*	I(0)	I(0)*	I(3)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
		Int. & trend	I(1)*	I(4)*	I(0)*	I(0)	I(1)*	I(0)*	I(3)*	I(0)*	I(3)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
	Lag 6	Int. no trend	I(1)	I(3)	I(0)*	I(0)	I(1)*	I(0)*	I(0)	I(0)*	I(3)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
		Int. & trend	I(1)	I(6)	I(0)*	I(0)	I(1)*	I(3)*	I(0)	I(0)*	I(3)*	I(0)	I(0)*	I(0)	I(3)	I(0)	I(0)*
	Lag 7	Int. no trend	I(1)	I(2)	I(0)*	I(0)	I(1)*	I(0)	I(1)	I(0)*	I(0)	I(0)*	I(0)*	I(0)	I(3)	I(0)	I(0)*
		Int. & trend	I(1)	I(2)	I(0)*	I(0)	I(1)*	I(0)	I(3)	I(0)*	I(0)	I(0)*	I(0)*	I(0)	I(3)	I(0)	I(0)*

Notes

Original data was transformed into fully deflated ratios and log ratios. I (ρ) denote the order of integration. Tests for unit roots for each variable were performed over three (3) to seven (7) lags consecutively because VAR and cointegration depend on the selection of an appropriate lag. Where values of the information criteria gave conflicting results I chose the most common result was selected. In rare cases where no common result emerged I followed the SBC. Pesaran and Smith (1999, p75) follow a similar rule. The order of integration, I (ρ), may change with the lag length. Higher lag orders reduce the power of the tests as well as the useful sample size. The asterisks * denote rejection at 5 % critical value.

6.9 Model Specification

For pedagogical completeness, it must be noted that model specification must pay particular attention to the attendant properties of the individual time series under consideration. Specification refers to the choice of a valid model. Spanos (1997) demonstrated that researchers have an option to specify the VAR model using a statistical approach or a systems approach. The methods are complementary rather than mutually exclusive.

(a) The Statistical Model

According to Spanos (1997, p14) a statistical framework requires the researcher to spell out the assumed joint distribution properties of the multivariate process. The statistical method makes use of "graphical representations and descriptive statistics" to condense the properties of the data generating process.

Assumptions help to simplify modelling and statistical inference. As in any statistical model, assumptions impose restrictions on the properties of variables in order to exorcise (or at least tame) the curses of dimensionality and over parameterisation. In fact, Mills (1993 p128) argues that the non-zero covariances in VARs allow temporal dependence among the time series observations thereby increasing unknown parameters with time. Restrictive techniques are imposed to limit the lag length and effects of over parameterisation. Parameter variances are sometimes assumed to decrease with the increase in lag length. The statistical concept of conditioning arrests the problems of dimensionality (i.e. many unknown parameters) while the assumption of asymptotic independence enables generalisation of the statistical properties of data sets.

Spanos (1999, p13) emphasises that model specification has to address three important assumptions pertaining to (a) distribution (b) temporal dependence and (c) time heterogeneity. These assumptions "formalises the chance regularity" of a stochastic data generating process. In a Probabilistic Reduction Approach [PRA] the statistical VAR model assumes that the distribution is normal, temporal dependence a Markov (p) process, and the degree of time heterogeneity to be given by second order stationarity.

172

Spanos et al (1997, p17) define the Statistical Generating Mechanism of a statistical VAR model as follows:

$$Z_t = E(Z_t \mid Z_{t-1} = z_{t-1}, \cdots, Z_{t-p} = z_{t-p}) + \xi_t \qquad (6)$$

$$Z_t = B_0 + B_1 Z_{t-1} + B_2 Z_{t-2} + \cdots + B_p Z_{t-p} + \xi_t$$

$$Z_t = B_0 + \sum_{i=1}^{p} B_i Z_{t-i} + \xi_t$$

The full model and its assumptions are documented in Spanos (1999) and Spanos et al (1997, pp 17-18). Their work suggests that estimated coefficients are difficult to interpret since VAR is a statistical model whose parameters represent "partial correlations." In their view, reliance should be placed on statistical procedures such as Granger causality tests, impulse response analysis [IRF], and variance decomposition analysis [VDC] for policy evaluation (Ibid p 24). I agree that VAR coefficients oscillate with successive lags and are sensitive to data sets. However, Granger causality, IRF and VDC are equally sensitive to available information. In my view, the techniques buttress one another.

Graphs provide a useful medium to express relationship among variables, and a visual expression of ideas. Spanos (1999, p14) suggests graphical analysis is indispensable in empirical modelling. He traces emphasis on graphical techniques to Turkey (1962), R A Fisher (1926) and Pearson (1892).

As early as 1891, Keynes (p321-2) wrote:

In the use of statistics, considerable assistance may often be derived from the employment of diagrams. The graphical method is not only useful for ... enabling the mind more accurately to realise numerical comparisons; but it has also a genuine scientific value."

Granger (1990), cited in Spanos et al (1997, p14) concurs, "The plotting of series, both individually and jointly, is an essential step in the modelling process that it is too frequently missed by experienced researches." Demirgüç-Kunt, and Levine (1999) largely use graphs and correlations to demonstrate the stylised facts relating to economic and financial development. In VAR literature, results of the IRF and VDC analytical techniques are usually presented in graphical format to map the causal links and the persistence of shocks over time.

173

The unrestricted VAR model may be used to test Granger causality. For economic purposes, causality is tantamount to prediction. Thus, X Granger causes Y (X → Y) if past values of X provide better prediction of Y, other information being equal. Adapting Charemza and Deadman's (1992, p192) bivariate model given in Equation 7, if $B_1 = B_2 = \cdots B_k = 0$, x does not Granger cause y.

$$y_t = \alpha_0 + \sum_{j=1}^{k} \alpha_j y_{t-j} + \sum_{j=1}^{k} B_j X_{t-j} + \xi_t \tag{7}$$

The basic insights are that a cause cannot come after the effect; and the future cannot "cause" the present. In addition Charemza and Deadman (1992, p189) observe that there is no simultaneous causation. Furthermore instantaneous causation does not exist due to the lags between independent actions.

Granger causality tests are sometimes used to eliminate variables whose coefficients are not statistically significant. Darnell and Evans (1992, p127), cite several sources arguing that Granger non-causality is not a sufficient condition for exogeneity. Maddala and Kim (1998, p189) endorse Pagan's (1989) conclusion that Granger causality "probably generated more nonsense results" than any econometric turning in the last two decades. Therefore, no Granger causality tests are performed in this thesis, since they are very sensitive to the information set available and causal ordering regardless of structural relationships.

(b) The Dynamic VAR Model

Dynamic models take into account time lags to show the interdependence between current values of the regressand and past values of explanatory variables, including the predictand's own past values. The dynamic linear equation is divided into systematic and non-systematic components. It is regarded as the typical VAR representation. Dynamic VAR processes can be presented in a number of notations. Typical notations are the VAR(p) representation, where p denotes the lag length of a VAR process, and the polynomial lag operator (θL) format. A lag operator represents a number of algebraic manipulations that replace a current realisation by previous observations in the time series. It facilitates the generation of a weighted moving average of a given time series. Whatever notation one prefers the end result is the same. The lag operator is mentioned here for completeness and will not be discussed.

174

Given T observations, a simple unrestricted VAR model of order (p), VAR(p) for short, in a transposed matrix notation is formulated as follows:-

$$Z_t = B_0 + B_1 Z_{t-1} + B_2 Z_{t-2} + \cdots + B_p Z_{t-p} + \xi_t \, , \qquad t \in T, \xi_t \sim NIID(0,\Omega) \quad \text{(8)}$$

Any VAR(p) process can be represented in a compact VAR(1) format

$$Z_t = B_0 + B' Z_{t-i} + \xi_t \, , \qquad t \in T, \xi_t \sim NIID(0,\Omega) \quad \text{(9)}$$

In this system of equations:

$Z_t = (z_1, z_2 \cdots, z_{mt})'$ is an (n x 1) stochastic vector of current observations for each of the variables in the model.

$B_0 = \mu = (\mu_1, \mu_2, \cdots \mu_m)'$ is an (n x 1) vector of constant (or fixed) vector of intercepts to accommodate none zero means.

$$B_i = \Theta_i = \begin{bmatrix} \Theta_{11} & \cdots & \Theta_{1m} \\ \vdots & \ddots & \vdots \\ \Theta_{m1} & \cdots & \Theta_{mm} \end{bmatrix}$$

are mxm or (m^2) matrices of constant coefficients, β_1 to β_p whose elements are regarded as the theoretical parameters.

ξ_t is an ($nx1$) vector of normal, independent, and identically distributed (NIID) error terms, that is, $\xi_t = (e_1, e_2, \cdots, e_m)$ with zero mean, $E(\xi_t) = 0$, and a non-singular, i.e. $\det(\Omega) \neq 0$, covariance matrix, $E(e_t, e_t') = \Omega$, for all t ($\forall t$). ξ_t is the innovation process typically referred to as white noise[v].

In matrix notation the following vectors can be defined:

$$Z_t := \begin{bmatrix} Z_1 \\ Z_2 \\ \vdots \\ Z_T \end{bmatrix}, \; B_0 := \begin{bmatrix} B_0 \\ 0 \\ \vdots \\ 0 \end{bmatrix}, \; B := \begin{bmatrix} B_1 & B_2 & \cdots & B_{p-1} & B_p \\ I & 0 & \cdots & 0 & 0 \\ 0 & I & \cdots & 0 & 0 \\ \vdots & \vdots & \cdots & \vdots & \vdots \\ 0 & 0 & \cdots & I & 0 \end{bmatrix}, \; Z_{t-i} := \begin{bmatrix} Z_{t-1} \\ Z_{t-2} \\ \vdots \\ Z_{t-p} \end{bmatrix}, \; \xi_t := \begin{bmatrix} e_t \\ 0 \\ \vdots \\ 0 \end{bmatrix},$$

Where Z_{t-i} denotes variables of Z_t vector lagged i periods.

As noted before, econometricians e.g. Spanos et al (1997, p13) divide the VAR model into systematic and non-systematic components. The systematic component determines intertemporal dependence, $E(Z_t | Z_{t-1})$, while the non-systematic component summarises "the contemporaneous dependence of the process" $E(\xi_t | Z_{t-1})$, as depicted by a non-diagonal variance - covariance matrix of the residuals. The unobservable multivariate error term ξ_t determines the system's stochastic properties. All residuals gathered from all the equations help estimate the covariance matrix, Ω. Darrell and Evans (1990, p120) concur that each variable in vector Z_t has two parts: "its best predictor based on past values of all included variables and its linearly unpredictable 'innovation,' e_t."

There is a dynamic linear dependence between the dependent variables in the (n x 1) vector Z_t and "the past history of all other variables," Spanos et al (1997, p9). Generally, the dynamic properties of VARs are more important than the parameter estimates. Enders (1995, p301), citing in particular Sims (1980) and Doan (1992) reiterates that VAR analysis is concerned with "dynamic inter-relationships around the variables, not the parameter estimates". Therefore, most researchers, including this thesis, apply vector autoregressions in conjunction with IRF and VDC analyses.

In mathematical terms, Equation 9, duplicated here for exposition purposes, denotes the unrestricted VAR model.

$$Z_t = B_0 + B'Z_{t-i} + \xi_t, \qquad t \in T, \xi_t \sim NIID(0, \Omega) \tag{10}$$

Alternatively:

$$Z_t = B_0 + \sum_{i=1}^{p} B_i Z_{t-i} + \xi_t, \qquad t \in T, \xi_t \sim NIID(0, \Omega) \tag{11}$$

Following Davidson et al (1978), Charemza and Deadman (1992, p182) refer to the unrestricted dynamic model as the general model. Enders (1995, p292) refers to this as the standard VAR form. Either terminology may be used. By definition, vectors and matrices are used to derive the VAR solution. Vectors and matrices thus facilitate the specification of economic relations as well as statistical inference. In fact Verbeek (2000, p12) notes "familiarity with [the] matrix 'language' is a prerequisite to reading the econometrics literature."

6.10 Model Estimation

Equations in the general VAR process are subject to the same lagged right hand side (RHS) variables. By definition the error terms are not correlated with the explanatory variables. Therefore, it is generally agreed that the solution to the unrestricted VAR model can be "constantly" estimated equation by equation by the Ordinary Least Squares (OLS). Davidson and MacKinnon (1993, p685), Charemza and Deadman (1992, p183), and Spanos et al (1997, p21) support this view. It must be noted that VAR coefficients are subject to multiple cross equation feedbacks and temporal variations. In practice, for reasons discussed below, multivariate regression is preferable to OLS.

Residuals generated by the VAR system of equations are utilised to estimate a typically non-zero covariance matrix Ω. Its properties are important for both estimation and hypothesis testing. Conventionally, estimation of parameters of interest, B and Ω requires the making of assumptions about the time series (Z_t) and the error (ξ_t) processes. The multivariate error term ξ_t is "assumed to be contemporaneously correlated but not auto correlated so that it has a non-diagonal covariance matrix," Charemza and Deadman (1992, p182).

The parameters of unknown coefficient vectors $B_0, B_1, B_2, \cdots, B_p$ and Ω are estimated from available data. There are various approaches that may be used, including but not restricted to, OLS, quadratic equations, etc. The objective of the OLS method is to estimate parameters of B so that the sum of error term squares is minimized. Johnson, Johnson and Buse (1987, Chapter 7) provide a comprehensive step-by-step textbook analysis of how the well-known matrix solution is derived. On differentiating the OLS equation with respect to $\hat{B}$ and setting the derivative to zero, yields simultaneous equations and unknowns equal to the number of variables that are expressible in matrix notation. Solving for $\hat{B}$, and following Spanos et al (1997, p21)'s notation, the least square estimator of B which minimises the residual sum of squares is given by

$$\hat{B} = (Z'_{-1} Z_{-1})^{-1} Z_{-1} Z \tag{12}$$

The estimator $\hat{B}$ is orthogonal [independent] of the variance-covariance matrix of the error terms ξ_t.

177

It is a well-known fact that if no restrictions are imposed on the coefficients matrix B, the OLS and ML methods yield identical parameter estimates. Econometricians, for instance Davidson and MacKinnon (1993, p245) argue that ML estimators, i.e. $\hat{B}$ will be consistent, asymptotically normal and asymptotically efficient. Following Harvey (1989), Charemza and Deadman (1992, p183) support the view that OLS and multiple regression approaches lead to same results if there are no restrictions on coefficients. However, multivariate regression is usually preferred to take an explicit account of non-zero covariance matrix. Davidson and MacKinnon (1993, p685) emphasise the importance of the covariance matrix in generating maximum likelihood (ML) test statistics. Recursive and iterative procedures may be adopted for forecasting purposes.

In their true spirit, VAR models are considered atheoretical hence identification becomes difficult and results are potentially very mechanical. Intuitively non-statistical information, such as institutional factors and theory, may be used to validate restrictions regarding the memory and evolution of the series (Z_t). In fact imposition of linear restrictions generates a relationship among the system equations. Statistically the covariance matrix, Ω, might enter the estimator of B. The nature of the restrictions applied influences estimation procedures.

Charemza and Deadman (1992, p184) support the use of Bayesian analysis. Davidson and MacKinnon (1993, p686) noted that Litterman (1977, 1986) takes Bayesian VARs (BVAR) to "provide better forecasts than convectional unrestricted VARs." These suggestions reinforce Cooley and LeRoy's (1985) argument that regards triangulated specification and systematic lags as structural transformations. However Spanos et al (1997, p22) prefer the employment of statistical to theoretical restrictions "to identify the restrictions on the VAR parameters" as the later are against the sprit of VAR. Restricted VAR's [RVAR] and incomplete VARs [IVAR], estimated by multi-variance regression concepts such as the Seemingly Unrelated Regression (SURE), are preferred to Bayesian restrictions. Davidson and MacKinnon (1993, p685) confirm that the VAR model has a SURE form. Nevertheless Kennedy (1998, p175) confirms that there is no benefit from using SURE because in VAR the explanatory variables are identical. A diagonal variance covariance matrix of error terms has a similar effect. Therefore, in this thesis, neither BVAR nor SURE are pursued.

7. COINTEGRATED VARS

7.1 Integrated variables

Integrated variables are individually driven by permanent (or nearly permanent shocks.) Such variables are usually said to be non-stationary, explosive, or to contain unit roots. The order of integration, $I(d)$, denotes the number of times a series has to be differenced to render it stationary.

7.2 Cointegration

Cointegrated variables are individually integrated processes that are jointly stationary; that is, jointly driven by transitory shocks. Cointegration exists if, and only if, there is a linear combination of integrated variables that is driven by common trends. If variables are cointegrated there is a long run link among them. The weighted sum of cointegrated variables is mean reverting. Residuals obtained from such linear combinations are stationary, i.e. $I(0)$ processes, and hence are subject to time series modelling. The stationarity properties of VAR processes are used to derive the asymptotic properties of the parameter estimators. According to Watson (1994, p2844) there are four alternative ways of representing cointegrated systems. These are the moving average, common trends, triangular, and the vector error correction model (VECM) representations. This study adopts the VECM framework and follows the Johansen procedure to test for cointegration and estimate the parameters.

7.3 The Johansen Cointegration Procedure

The Johansen cointegration procedure is one of the most popular approaches to cointegration analysis. Masih and Masih (1999, p8) argue that the Johansen procedure, unlike the Engle-Granger procedure, is not sensitive to the choice of the dependent variable and the variable being normalised. The procedure depends on the assumption that the error vector, ξ_t, is multivariate

179

normal across time and independent of observations (NID). Johansen (1988, 1991, 1992, 1995) applies maximum likelihood (ML) to the VAR model and provides for the existence of more than one cointegration relationships.

Johansen and Juselius (1990, 1992, 1994), JJ for short, extended the model. As noted in Maddala and Kim (1998, p174) Johansen and Juselius (1994, p8) distinguish among generic [linear statistical] identification, empirical identification and economic identification. For a start, the JJ approach is atheoretical with cointegration reduced to a statistical concept, possibly devoid of any structural interpretation. The model's dynamic properties are completely determined by the sample data under consideration. Theoretical restrictions are adopted ex-post, that is, after establishing the number of long run cointegrating relationships. Cointegration analysis of a VAR(p) model can easily be performed by rewriting the VAR(p) model into the first difference version. This transformation takes the analysis to the VECM format.

7.4 Vector Error Correction Model

The Granger Representation Theorem states that a cointegrated VAR system has a short run error correction mechanism that drives variables to their long run equilibrium relationship. The error correction model (ECM) represents deviations from the long run equilibrium. Hoffman and Rasche (1997,p1) define error correction terms as "mean reverting weighted sums of cointegrating vectors and dated $t-1$." The mechanism drives the system's short run dynamic properties. It forces adjustments in at least one series to correct for deviations in the long run relationship. In the Johansen and Juselius (JJ) approach there can be several short run mechanisms to reach the same long run equilibrium. Similarly, it was noted that the Johansen procedure provides for more than one equilibrium relationship among variables in a model.

There is a general consensus in literature that VAR models can be analysed and tested in a VECM formulation. Pesaran and Pesaran (1997, pp 132-3 and 291) show that the Johansen ML cointegration options in Microfit provide a unified framework for estimating and testing cointegration relationships based on a generalised VECM framework. From Equation 8 a typical VAR(p) model is represented as:

$$Z_t = B_0 + B_1 Z_{t-1} + B_2 Z_{t-2} + \cdots + B_p Z_{t-p} + \xi_t, \qquad t \in T, \xi_t \sim NIID(0,\Omega) \quad \textbf{(13)}$$

Where as before $B_i (i = 1,2,\cdots,p)$ are parameters.

Under cointegration, the VAR model in Equation 13 can be reparameter-ised in the error correction model as formulated in Equation 14 below.

$$\Delta Z_t = u + \Gamma_1 \Delta Z_{t-1} + \cdots + \Gamma_{p-1} \Delta_1 Z_{t-p+1} + \Pi Z_{t-p} + \xi_t \qquad \textbf{(14)}$$

Where $\Gamma_i = (B_1 + B_2 + \cdots B_i) - I$, for $(i = 1,2,\cdots,p-1)$

$\Pi = (B_1 + B_2 + \cdots B_p) - I$, and

μ = vector of constants and any deterministic components of the system.

Hoffman and Rasche (1997, p2) emphasise the well-known fact that a VECM represents a standard VAR model in the first difference of Z_t, "aug-mented by the 'error correction' terms..." The only difference between equation 13 as a standard VAR model in the first difference and equation 14 is the error correction component ΠZ_{t-p}. Intuitively, if there is no cointegration the VECM has as many independent shocks as the number of variables in the model. In the presence of cointegration the model contains r individual error-correction components derived from r cointegration relationships. The error correction terms represent the speed and direction of short-run (single lag) adjustments to deviations from the long run cointegration relationship. In summary cointegrat-ing vectors are estimates of long run relationships in a VAR system. The sign and size of the coefficients of error correction terms characterise the direction and speed of short run adjustments in the cointegrating systems.

7.5 Formal Cointegration Analysis

In principle the cointegrating VAR model assumes endogenous $I(1)$ vari-ables, which necessitates the use of a VAR model in first differences. It is a well-known statistical fact that if Z_t is $I(1)$, it follows that the first differences ΔZ_t and the r cointegration vectors are $I(0)$. See Doornik, Hendry and Nielson (1998, p126) for example. Although Pesaran and Pesaran (1997, p286) reveal that Microfit presumes variables in a cointegrating VAR model to be $I(1)$ the

"Cointegrating VAR Menu" in Microfit permits analysis of cointegration models containing "$I(1)$ jointly determined variables, $I(1)$ exogenous variables, and $I(0)$ exogenous variables," (Ibid p127). The order of variables is considered important for purposes of orthogonalized IRF analysis and orthogonalized error variance decompositions analysis. Furthermore Pesaran and Pesaran (1997, p322) suggest that inclusion of $I(0)$ variables in the VAR "allow for the short-run movements in the $I(1)$ variables which moves away from their long-run equilibrium." Beveridge and Nelson (1981) as cited in Stock (1994, pp 2744 and 2747) formally show that $I(1)$ processes can be decomposed into $I(0)$ and $I(1)$ components. Luintel and Khan (1999, p391) argue that when a VAR model contains a mixture of $I(1)$ and $I(0)$ variables the later may be considered as weakly exogenous variables.

As the literature of cointegration progresses, new techniques are emerging that do not require rigorous determination of whether variables are $I(1)$ or $I(0)$. Pesaran and Pesaran (1997, pp 302 - 8) discuss an autoregressive distributed lad (ARDL) procedure in which it is not necessary to determine whether the regressors are $I(1)$ or $I(0)$. Haldrup (1998) reviews the growing literature on the econometric analysis of $I(2)$ variables and polynomial cointegration. Shintani (2000) recently proposed fully nonparametric approach to cointegration that does not require VAR based tests. In my view, the challenge to develop procedures that do not depend on fluid distinctions regarding the order of integration and extent of cointegration is strong.

In practice the order of integration may vary from sample to sample if not from researcher to researcher, hence Z_i is sometimes assumed rather than "proven" to be $I(1)$. In this thesis, the real per capita income expressed in logs, LPCY, is the principal indicator of macroeconomic development. In Table 10, the information criteria suggest that LPCY is $I(0)$. However, the test statistics does not reject the null hypothesis that LPCY has a unit root, i.e. is $I(1)$. In a number of other cases depicted in Tables 9 and 10 the test statistics does not reject the null hypothesis of a unit root for some variables the information criteria rendered $I(0)$. Therefore, in empirical literature some variables are treated as though they are $I(1)$ or $I(0)$ depending on the underlying assumptions of the adopted procedure. The next paragraph discusses some valid methodological considerations regarding the potential mixture of $I(1)$ and $I(0)$ variables.

If the vector Z_t is $I(0)$ the solution can be obtained by OLS methods. In deed Pesaran and Smith (1998, p65) point out that any linear combination of $I(0)$ variables are also $I(0)$ variables. In any case the unrestricted VAR model has same variables in common hence yield the same estimates as the OLS and ML methods. According to Doornik (1998, p159) the asymptotic distributions of the trace and maximum-eigenvalue test statistics are not affected by the presence of $I(0)$ components. Therefore Johansen maximum likelihood estimation can still be used in order to take advantage of system wide diagnostic statistics. This thesis employed Microfit's capacity to handle a VAR model with $I(1)$ and $I(0)$ variables. Some variables rendered $I(0)$ by the information criteria might as well be $I(1)$ if reliance is placed on the fact that the null hypothesis of a unit root could not be rejected. Masih and Masih (1999, p8) however concur that "the Johansen procedure requires variables not to be $I(2)$, but can admit both $I(1)$ only and a mixture of $I(1)$ and $I(0)$ processes, in systems used for testing the order of cointegration rank." A temptation arising from Pesaran and Pesaran (1997, Chapter 16) to order the variables on the basis of endogeneity or exogeneity was avoided as it runs contrary to the VAR spirit; and restricts system-wide interactions and by extension the number of cointegration relationships.

The formal cointegration model specified in this thesis is principally based on a five series VAR methodology incorporating the core economic sectors in a small open economy such as Zimbabwe. Watson (1994, p2901) asserts that it is "very important" for structural analysis to take into account all "important macroeconomic shocks" active in the economic process. In fact Luintel and Khan (1999, p383) concur that many bivariate and trivariate VAR systems are misspecified rendering the results questionable. Most researchers simply adopt low dimension models in order to accommodate small data sets and the resultant fast exhaustion of degrees of freedom. However, basing policy on flawed small scale VAR modelling systems can be disastrous.

In this study, economic activity in Zimbabwe is assumed to depend on the monetary base, fiscal policy, international trade, and financial development. Therefore, a five variable VAR model incorporating indicators representing each these structural segments is employed to investigate the dynamic interrelationships among the variables. Following a rich multivariate analysis is consistent with similar studies of Lehr and Wang (2000), Levine (1997), Levine et al (2000)

and Luintel and Khan (1999). In the jargon of econometrics, Lehr and Wang (2000) identify four important structural shocks viz: real supply shock (Real GDP), fiscal expansion shock $\left(\dfrac{\text{Real G}}{\text{Real GDP}}\right)$, monetary shock (measure of money) and a financial intermediation shock (proxy for financial intermediation). While their diagnosis is very persuasive, very few countries are closed economies. Economic activity particularly in small economies is vulnerable to the vagaries of international developments hence the inclusion of foreign trade in this study. In fact Levine et al (2000, p45) include measures of government size, inflation, parallel market exchange rate premium, and openness to international trade in their policy conditioning information set. In footnote 12 on the same page Levine et al, however, acknowledge that inflation and government size both serve as indicators of macroeconomic stability. Similarly the parallel market exchange premium could be regarded as a composite "index of trade, exchange rate, and price distortions." I have not used the parallel exchange rate premium because it is difficult to observe; and the available data does not cover the period under consideration. The data used in this study consists of annual observations for the period 1924 to 1998 deflated to reflect 1995 quantities. All variables are expressed in natural logarithms to represent the levels of the variables. For computational convenience, growth rates are expressed as first difference of the logarithms of the variables.

Two variables are employed as alternative proxies for economic activity. These are logarithms of real per capita in come (LPCY) and the rate of real per capita income growth (LGPCY). The monetary base is represented by the logarithm of the ratio of real currency in circulation (CIC) to real GDP. Both Rousseau and Wachtel (1998) and Lehr and Wang (2000) include the monetary base as a separate conditioning variable in their study of the causal links between from the intensity of financial intermediation and economic activity. Real government expenditure to real GDP (G) and the fiscal balance (FSB) are adopted as proxies for government size or fiscal shocks. The current account balance (CAB) or the degree of openness to international trade (OPEN) as measured by the ratio of real exports and real imports to real GDP are treated as alternative proxies for foreign trade. Financial sophistication (FI) is measured as a ratio of alternative real financial assets to real GDP or real credit aggregates to real

GDP. Apart from indicators based on financial assets and credit aggregates, some researchers often use monetary aggregates such as M2 as proxies for financial development. Lynch (1993, p8) and Luintel and Khan (1999, p386) concur that the later aggregates measure the degree of monetisation rather than financial deepening or financial development. Beck, Demirgüç-Kunt and Levine (1999) developed a comprehensive array of indicators based on financial assets and credit aggregate, which have found a receptive audience in financial intermediation literature. Some of the financial indicators adopted in this thesis include Liquid Liabilities (LQL), total financial assets (TFA) and private sector credit (PSC). Each component of financial intermediation (FI) is modelled separately in order to capture aggregates that determine economic activity.

Section 5 provided a discussion of some variables included in the study and data transformations. In section 8 the results of cointegration tests, their interpretation and evaluation are presented. Some useful financial aggregates identified in the financial intermediation literature were excluded from the rigorous model due institutional and data constraints. Although Luintel and Khan (1999, p383) distinguish the real interest rate as an important determinant of financial development, the variable has not been used because administered interest rates were prevalent in Zimbabwe for the period under consideration. Furthermore market capitalisation (SMC) and turnover (TOV) were excluded from formal cointegration analysis due to paucity of quality data sets.

To test for cointegration among financial development, economic activity, and three conditioning macroeconomic variables the JJ approach is applied. Given a (5 by 1) vector $Z_t = (\text{LPCY}, \text{CIC}, \text{G}, \text{CAB}, \text{FI})'$ of time series data at date t, the dynamic interrelationships of Z_t are characterised by the system in Equation 14 duplicated below for exposition purposes:

$$\Delta Z_t = \mu + \Gamma_1 \Delta Z_{t-1} + \Gamma_2 \Delta Z_{t-2} + \cdots + \Gamma_{p-1} \Delta Z_{t-p+1} + \Pi Z_{t-p} + \xi_t \tag{15}$$

Where Z_t = vector of (5 x 1) dimensional time series data.

Δ = difference operator

μ = vector of constants and any deterministic components of the system.

Γ_i = (5 by 5) coefficient matrices for periods ($i = 1, 2, \cdots, p$) capturing short run dynamic effects or adjustments to changes in Z_t.

Π = long run multiplier matrix or impact matrix, which determines the existence and extent of cointegration among variables in Z_t.

ξ_t = (5 by 1) vector of Gaussian errors

Compactly, the cointegrating VAR can also be reformulated as

$$\Delta Z_t = \mu + \sum_{i=1}^{p-1} \Gamma_i \Delta Z_{t-i} + \Pi Z_{t-p} + \xi_t \tag{16}$$

Where as before

$\Gamma_i = (B_1 + B_2 + \cdots B_i) - I$, for $(i = 1,2,\cdots, p-1)$ depicting short run dynamics

$\Pi = (B_1 + B_2 + \cdots B_p) - I$, or $-(I - \sum_{i=1}^{p} B_i)$ representing the long run effects.

Under the Johansen procedure the first step is to test for, or to determine, the number of distinct cointegration vectors r of the matrix Π. The 5 by 5 impact matrix Π summarises the long run relationships between ΔZ_t and other components in the system in Equation 16. The null hypothesis involves establishing whether Π has full rank: $H_r : Rank(\Pi) = r < p$. As Masih and Masih (1999, p9) put it, "If Π has zero rank, no stationary linear combination can be identified," hence there is no cointegration among the variables in Z_t. In contrast, if Π has a rank r greater than zero, there are r cointegrating relationships or "possible linear stationary combinations" (Ibid).

If cointegration exists among the variables, it follows that Π will be "rank deficient." Such a property implies that there will be $0 < r < 5$ potential cointegration relationships in the five variable models under consideration. It follows that the behaviour of Z_t may be explained by a few $0 < r < 5$ independent innovations. Since the impact matrix Π is rank deficient in presence of cointegration it can be decomposed as $\Pi = \alpha B'$ where α and B are (5 x r) matrices.

Substituting for Π, Equation (15) can be represented as follows:

$$\Delta Z_t = \mu + \Gamma_1 \Delta Z_{t-1} + \Gamma_2 \Delta Z_{t-2} + \cdots + \Gamma_{p-1} \Delta Z_{t-p+1} + \alpha(B' Z_{t-p}) + \xi_t \tag{17}$$

Where $[Z_t \sim I(1), \Delta Z_t \sim I(0)]$.

Compactly

$$\Delta Z_t = \mu + \sum_{i=1}^{p-1} \Gamma_i \Delta Z_{t-i} + \alpha(B'Z_{t-p}) + \xi_t \qquad (18)$$

$$= \mu + \sum_{i=1}^{p-1} \Gamma_i \Delta Z_{t-i} + \alpha B'Z_{t-p} + \xi_t$$

Considering $\Pi = \alpha B'$, it is well known that the rows of B denote the distinct cointegrating vectors rendering $B'Z_t$ linear stationary processes, $I(0)$. The matrix α contains coefficients or loading factors of the error correction terms, which indicate the speed of adjustment corresponding to each of the cointegrating vectors. In practice B is not unique as more than one cointegrating vector may be identified $0 < r < 5$. Restrictions found on economic theory may be applied in order to identify a unique long-run economic relationship.

Statistically, the number of cointegrating vectors is equal to the number of non-zero characteristic roots (eigenvalues). Given n linearly independent eigenvectors $(x_1, x_2, \cdots, x_n)$ for trix B, each eigenvector x_i is associated with an eigenvalue λ_i. A diagonalisation of the eigenvalues $\begin{pmatrix} \lambda_1 & \cdots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \cdots & \lambda_n \end{pmatrix}$ emerges. Verbeek (2000, p298) points out "each nonzero eigenvalue corresponds to a cointegrating vector." Hypotheses tests regarding the rank of Π are based on estimated eigenvalues.

Johansen's full information maximum likelihood (FIML) approach uses two test statistics, namely the trace test λ_{trace} and the maximum eigenvalue test λ_{max}, to compute the number of cointegrating vectors. In brief, maximization of the likelihood function in the Johansen method corresponds to parameter estimation by setting a square matrix's determinant and cross products of the residuals to a minimum. The eigenvalues λ_i, $i = 1, 2, \cdots n$, are used to test alternative hypothesis regarding the order of r. The trace λ_{trace} tests for a null hypothesis of at most r cointegrating relationships $H_0 : r \le r_0$ against an alternative of at least $r+1$ cointegrating vectors $H_1 : r_0 < r \le n$. In effect the trace statistics checks whether the smallest $n - r_0$ eigenvalues are significantly different from zero. The maximum eigenvalue λ_{max} tests for a null hypothesis of at most r

cointegrating vectors $H_0 : r \leq r_0$ against an alternative exactly $r+1$ cointegrating vectors, $H_1 : r = r_0 + 1$. Verbeek (2000, p296) notes that the maximum eigenvalue λ_{max} test is based on the estimated $(r_0 + 1)^{th}$ largest eigenvalue. According to Masih and Masih (1999, p9), under the JJ approach, "larger eigenvalues are associated with the cointegrating vector being more correlated with the stationary component of the process." In the event of conflicting test results, Luintel and Khan (1999, p392) reveal that under the Johansen procedure trace tests have been found to be "more robust" than maximal eigenvalues tests.

7.6 VAR Order and Deterministic Variables

There are a number of data depended decisions which have to be made in conjunction with application of Johansen procedure. Apart from choosing the number and span of endogenous variables to be included in the model, a decision is required regarding the order of integration among the variables. Furthermore an appropriate VAR order (i.e. lag length) needs to be selected in order to improve model performance. Low order VAR models are prone to serial correlation while higher order VARs run the risk of over parameterisation and fast exhaustion of the degrees of freedom. Microfit employs the Akaike Information Criterion (AIC) and the Schwartz Bayesian Criterion (SBC) to facilitate the determination of the lag length. Cointegration analysis in this thesis is based on a VAR model of order of 4. Thus, the first four observations are treated as presample values. This results in the reduction of the sample size by the lag length. Number of variables included has similar effects. Tests for cointegration are sensitive to the nature of deterministic trends variables (trends and intercepts). To this end, allowance has been made for a model with restricted intercepts and no trends in the VARs. This specification is valid because in the presence of cointegration trends can still be identified. Unrestricted SURE regressions not reported in this thesis found intercepts and trends to be statistically significant.

7.7 Impulse Response Analysis

According to Sims (1980, p21), analysis of a cointegrating system's response to random shocks is a valuable post estimation tool that can shed light

188

on a system's speed of adjustment to the equilibrium relationship. The Generalised impulse response functions (GIRF), popularised by Pesaran and Pesaran (1997) among others, captures the short run dynamic properties arising form a variable specific shock (or innovation) on the different variables in the cointegrating VAR model. Shocks to variables in a VAR system generate contemporaneous interactions among the endogenous variables. A given shock affects the VAR system in several ways. It directly affects the dependent variable in its own equation. The shock is transmitted to other variables through the system of equations. Future values of all variables, including the original, may also be affected since current realisations become future lagged values. If the impulse responses are zero, the shocked variable has no causal effect on the system.

Conventionally, the impulse-response function is represented by a graph characterising the effect of a unit shock (equal to one standard error) on one variable on the future s ate of a cointegrating system. As Pesaran and Pesaran (1997, p444) point out, "the effect of shocks on cointegrating relations is bound to die out, and their time profile contains useful information on the speed of convergence of the model to its cointegrating (or 'equilibrium') relations." In contrast, the effects of variable specific or system wide shocks on individual variables in a cointegrating VAR model are persistent and may not die out "due to the rank deficiency of the of the long-run multiplier matrix, (Ibid, p443).

Nevertheless, it is well known that impulse responses pertaining to variable specific shocks are difficult to interpret. If the VAR system is incompletely specified standard errors of IRF tends to be large which renders IRA "worthless for structural interpretations," Spanos et al (1997, p63). Similar concerns are raised in Rankle (1987) who suggests that no strong conclusions should be drawn about the effect of innovations in time series data, as impulse response and variance decomposition are data and trend sensitive.

The orthogonalized impulse response function is frequently used in financial literature. Unlike the generalised impulse responses, the orthogonalized impulse responses are subject to many permutations if no prior causality tests have been conducted. Contemporaneous correlations among variables in a model render determination of unique impulse responses difficult. Modellers often resort to ordering a system's innovations into an orthogonal transforma-

tion. In Sims (1980) Choleski decomposition was arbitrary applied to triangulate the variables. Ordering dictates the direction of causation among variables in the system. In other words, each error term is directed to affect only error terms in equations ranked below the given error term's own equation. Generalised impulse responses are not sensitive to the way the variables are ordered.

In real life, economic shocks rarely occur in one variable at a time. Thus, the persistence profile (PP) may be used to characterise the effect of system-wide shocks on cointegrating relationships. By construction, the impact of a shock in the persistence profile has a value of unity, which tends to zero as the time horizon tends to infinity.

Dynamic links in cointegrating systems may also be analysed through error correction terms. In summary cointegrating vectors represent the long run relationships. The sign and size of the coefficients of error correction terms characterise the direction and speed of short run adjustments in the cointegrating systems. This approach was discussed in detail in Section 7.4 above.

7.8 Variance Decomposition

The forecast error variance decomposition (VDC) provides another way to chart the short-run properties of the dynamic behaviour of a VAR model. According to Spanos et al (1997, p 63) "It breaks down the variance of the forecast error for each of variable [in the VAR model] into components that can be attributed to each of the endogenous variables [at different time horizons.]"

7.9 Limitations of VAR and Cointegration Analysis

Linearity is an aesthetic possibility but not an aesthetic necessity.

Davies J. P. (1997, p87)

(a) The atheoretical nature of VAR models

The atheoretical nature of VAR models has been subject to criticism in financial literature. Failure to select variables on the basis of prior knowledge could result in mechanical policy analysis. The economic meaning of VAR coef-

ficients is embroiled in controversy. Sims (1980, p20) argues VAR coefficients tend to oscillate with successive lags and are subject to "complicated cross equation feed backs" and time variations. Spanos et al (1997, p24) conclude that Granger causality tests, impulse response analysis, and variance decomposition produce better distinctive results than VAR coefficients. Following Cooley and LeRoy's (1985) persuasive view, Darnell and Evans (1990, p127-8) argue that in absence of theory VAR representation amounts to a summary of correlations in the data. Therefore, impulse response functions cannot be validly accepted as causal orderings.

Cooley and LeRoy (1985, p306) accuse some proponents of VAR to be "more interested in econometrics than economics." In fact, Bowbrick (1988, p9) warns that econometrics may be used for image projection to impress layman and colleagues. Darnell & Evans (1990, p126) hammer on the methodological limitations, which in their view, fail to reduce economic ignorance through a refutable representation that can critically test theories. Summers (1991) is even more pessimistic about the contribution of all econometric work to the development of macroeconomics. Darnell & Evans (1990,129) conclude that VAR "approach is not a part of science" because it does not contribute "to the scientific method of economics ..." and its proponents offer nothing new. If the models are interpreted as non-structural, the VAR itself becomes the structure and is no more than a superficially sophisticated summary of the historical correlations of the economic time series. Runkle's (1987, p13) conclusion is well known, "In other words, vector autoregression may let the data speak for themselves, but the data are not talking very loudly."

(b) Mitigation: social sciences are not perfect

These views run contrary to Leamer (1983) and Sims (1995). I agree with Sims (1995, p15) that some criticisms amount to "forensic exaggeration." Although economists are the most vocal critics of econometrics, economic science is not immune from criticism. Bowbrick (1988, p120) argues, "Pure economic science is nothing but a string of tautological logic, going from arbitrary assumptions to conclusions..." In Sims' (1995, p8) opinion the hypothesis testing view of science has several limitations because theories cannot be "tested" as "true" or "false" on the basis of decisive confrontations with data. Indeed

Sims (1995, p2) proposes that all science is a data compression exercise. In this context, it is possible to have a continuum of theories rather than a single true theory. Weintraub (1998, p1845) maintains that, "The concept of a true scientific theory itself has changed as the image of mathematical knowledge has changed..." Thus, the concept of economic and financial knowledge changes with time. No wonder Sims (1995, p8) regards "orthodoxy, hierarchy and methodological prescriptions as potential tools of priestly resistance to change."

In any case perfect knowledge is not available. Leamer (1983, p 36) argues that, "All knowledge is human belief; more accurately, human opinion," hence no one can design an experiment free of bias (p33). According to McCloskey (1983) as cited in Sims (1995) even the most rigorous writings in economics is engaged in persuasion. Although economists try to emulate the rigor of physics Sims (1995, p9) retorts that, "Economics is not physics." There is no scope for clean consensus in social sciences unlike natural sciences. Moreover, the difference between scientific experiments and natural experiments is one of degree rather than kind. For instance, there is a lot of scientific knowledge on astronomy though there are no experiments. As cited in Weintraub (1998, p1839) McCloskey (1994) concedes that mathematical models contribute to the advancement of economic knowledge: "Economics made progress without mathematics, but has made faster progress with it. Mathematics has brought transparency to many hundreds of economic arguments."

Whereas economists provide the most vehement criticism of their cousins in econometrics, the question of formalism in economics itself has never been settled. According to Taylor (2000, p2130) no discipline has yet achieved that feat "including physics, the science that economics most aspires to emulate." Physicists themselves are still debating "whether mathematics is 'nature's language' or is simply a tool for discovering her laws." Despite these methodological limitations, I agree with Mattesini [1993, p153] who notes that VAR techniques provide insight into the informational content of selected macroeconomic variables. A theory should not be criticised on the validity of its assumptions but validity of its implications. Criticising VAR for lack of theoretical context is logically inconsistent as the model's objective is to curb arbitrary restrictions in macro-economic models. Krugman (1998, p1829) advise readers not to confuse a complaint about quality with a complaint about methodology.

192

(c) Statistical limitations of VAR and cointegration analysis

Unrestricted VAR models are over parameterised and non-parsimonious. Unknown parameters in the unrestricted models increase with both the number of variables in the model and lag lengths. Increasing the number of repressors rapidly increases the number of parameters to be estimated. The degrees of freedom are reduced and out of sample forecasting capability limited. VAR models require availability of long data sets (i.e. large sample size) as a direct result of the over parameterisation problem. Increasing the time span and frequency of observations to a fixed span increases power of the tests.

Time series analysis, like derivatives, has acquired a habit of excessive proliferation. Nordhaus (1984) refers to the Balkanisation of econometrics. As Rankle (1987, 7) put it, "Vector autoregressions have brought with them their own terminology and folklore." Anything that works on the canonical data sets such as Box and Jenkins (1970) or Nelson and Plosser (1982) is considered an adequate model. While this practice has got an advantage of providing a standard yardstick to justify the relevance of results, the proliferation of jargon has made some to regard econometrics as a Babel Tower. The multiplication of conflicting unit root tests indicates the need to develop more robust approaches.

Harvey (1997) strongly attacks the whole concept of unit roots and vector autoregressions. Maddala and Kim (1998, pp 45, 92, 99, 486-8) strongly contest that "the unit root mania has gone too far" yet ADF, PP, and KPSS tests are useless and should not be used. They charge that there is currently too much asymptotic theory whereas significance levels upon which tests are based have been found misleading unless samples are very large. In my opinion 100 to 200 years used in some VAR models is too long a time span for effective policy analysis. A retractable model should produce results preferably in a generation if not a decade. It is customary to test the hypothesis that there is no cointegration, a practice that increases the probability of finding "spurious cointegration." In practice, most tests for cointegration search for a linear relationship among the variables. Following from this fact, if no cointegration is found, this would not rule out existence of a long-term relationship other than a long-term linear relationship. Fractional unit roots and fractional co-integration may not be ruled out.

193

(d) Mitigation: structural considerations

Spanos et al's (1997, p10) encourage the use of the Probabilistic Reduction Approach [PR] that takes into account theoretical and statistical considerations. Proponents of the PRA argue that theory should not exclude other information because the theoretical data concept is often different from the observable data series. Spanos et al (1997 p12) writes,

> The theory still determines the structural form, the relevant variables, and the general form of the statistical model, but the particular statistical specification is also influenced by the data.

Statistical inference, causality tests, and post regression analysis depend on validity of the assumptions. Logically, evaluation of the statistical adequacy of the model is an important step in the Probabilistic Reduction Approach. An accurately defined model uniquely summarises the nature and structure of data without contradicting the theory.

> Without a statistically adequate model that captures the systematic information in the data, no valid statistical inference is possible, irrespective of the sophistication and/or the potential validity of the theory (Spanos 1999, p16).

Similarly, the Johansen procedure frequently used in cointegration tests employs statistical properties to determine the rank of cointegration. Overall, the economic system determines the behaviour of macroeconomic variables simultaneously. Therefore every variable in VAR is regarded as endogenous and regressed on its own lagged values and that of all other variables. The Lucas Critique insisted that that the economic system and policymakers are interdependent rather than independent. If more than one cointegrating vectors are identified Pesaran and Pesaran's (1997) Long Run Structural Modelling (LRSM) could be used to select the appropriate model on the basis of theoretical considerations. Admittedly, Goodhart's Law", (1978) as cited in Kennedy (1998, p7), states that all econometric models break down when used for policy. In the final analysis, a model assists rather than substitute decision-making. Robertson and Tallman (1999, 4) concur that, "No model can be left on automatic pilot for too long." Throwing away VAR on the rational of its limitations would be tantamount to throwing away the baby with the bath water.

194

8. EMPIRICAL COINTEGRATION TESTS RESULTS

8.1 Financial Intermediary Development

Methodology, like sex, is better demonstrated than discussed, though often better anticipated than experienced

Leamer (1983, p40)

This section reports the main cointegration test results estimated under the Johansen full information maximum likelihood (FIML) approach. The idea is to determine the long run relationship between economic activity and an array of financial intermediation indicators. Intuitively model reliability should be addressed before it is used for statistical inference if it is to mimic the true data generating process. Three conditioning macroeconomic variables have been added to the model to address specification problems. Most cointegration tests conducted in this thesis are, therefore, based on a five variable model.

The JJ approach requires prior specification of an optimal autoregression order[w]. In all cases a maximum VAR order of 4 was chosen. As noted in Section 7.6 low order VAR models are prone to serial correlation and over rejection of the null hypothesis of no cointegration, while higher order VAR models run the risk of over parameterisation and loss of power. Furthermore, tests for cointegration are sensitive to the presence of trends and intercepts. An allowance has been made for a model with restricted intercepts and no trends in the VARs. This specification is given by "Case I I" under the "Cointegrating VAR Option" in Microfit. If cointegration exists "common trends" can still be identified.

Table 11 overleaf depicts the tests for the number of cointegration relationships. The table is divided into Panels A to C. Panel A gives the test results for the number of cointegration results based on maximal eigenvalues, which are listed in descending order on the table. Panel B employees the trace statistics to specify the number of cointegration relationships. In Panel C the model selection criteria is used to determine the number of cointegration vectors.

---

[w] In this thesis the JJ and Johansen approaches are used interchangeably.

Table 11

Testing for the rank of cointegration

Cointegration with restricted intercepts and no trends in the VAR
Panel A: Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix
****
71 observations from 1928 to 1998. Order of VAR = 4.
List of variables included in the cointegrating vector:

LGPCY	CIC	G	CAB	DMB

Intercept
List of eigenvalues in descending order:
.39955   .20360   .16197   .11230   .037358   .0000
****

Null	Alternative	Statistic	95% Critical Value	90% Critical Value	
r = 0	r = 1	36.2149	34.4000	31.7300	
r<= 1	r = 2	16.1633	28.2700	25.8000	r = 1
r<= 2	r = 3	12.5459	22.0400	19.8600	
r<= 3	r = 4	8.4574	15.8700	13.8100	
r<= 4	r = 5	2.7033	9.1600	7.5300	

****
Use the above table to determine r (the number of cointegrating vectors).

Cointegration with restricted intercepts and no trends in the VAR
Panel B: Cointegration LR Test Based on Trace of the Stochastic Matrix
****
71 observations from 1928 to 1998. Order of VAR = 4.
List of variables included in the cointegrating vector:

LGPCY	CIC	G	CAB	DMB

Intercept
List of eigenvalues in descending order:
.39955   .20360   .16197   .11230   .037358   .0000
****

Null	Alternative	Statistic	95% Critical Value	90% Critical Value	
r = 0	r>= 1	76.0848	75.9800	71.8100	
r<= 1	r>= 2	39.8699	53.4800	49.9500	r = 1
r<= 2	r>= 3	23.7065	34.8700	31.9300	
r<= 3	r>= 4	11.1607	20.1800	17.8800	
r<= 4	r = 5	2.7033	9.1600	7.5300	

****
Use the above table to determine r (the number of cointegrating vectors).

Cointegration with restricted intercepts and no trends in the VAR
Panel C: Choice of the Number of Cointegrating Relations Using Model Selecti n Criteria
****
71 observations from 1928 to 1998. Order of VAR = 4.
List of variables included in the cointegrating vector:

LGPCY	CIC	G	CAB	DMB

Intercept
List of eigenvalues in descending order:
.39955   .20360   .16197   .11230   .037358   .0000
****

Rank	Maximized LL	AIC	SBC	HQC	
r = 0	340.2543	265.2543	180.4038	231.5120	
r = 1	358.3618	273.3618	177.1979	235.1304	
r = 2	366.4434	273.4434	168.2288	231.6029	r = ?
r = 3	372.7164	273.7164	161.7137	229.1765	
r = 4	376.9451	273.9451	157.4171	227.6056	
r = 5	378.2967	273.2967	154.5060	226.0574	

****
AIC = Akaike Information Criterion   SBC = Schwarz Bayesian Criterion
HQC = Hannan-Quinn Criterion

Note:
LGPCY	=	Logarithm of real per capita income growth (computed as first log difference of real per capita income)
CIC	=	Logarithm of real currency in circulation to real GDP
G	=	Logarithm of real government expenditure to real GDP
CAB	=	Logarithm of real exports minus logarithm of real imports
DMB	=	Logarithm of total real assets of demand deposit taking banks to real GDP

196

In Table 11 both the maximal and trace eigenvalue statistics strongly reject the null hypothesis that there is no cointegration (i.e. $r = 0$) among the five time series data. Taken literally, Table 11 shows that the test statistics for the null $r = 0$ is larger than the respective critical values at 90% and 95% significance levels in both Panels A and B. The hypothesis that there is one cointegration relationship $r = 1$ among the variables cannot be rejected against $r = 2$, etc. Turning to Panel C, however, the rank of cointegration is indeterminate because there is no agreement among the Akaike Information Criterion (AIC), Schwartz Bayesian Information Criterion (SBC) and the Hannan-Quinn Criterion (HQC). Each information criterion suggests a different number of cointegration vectors. Notwithstanding this, it seems reasonable to follow the JJ approach and assume that there is one cointegration vector.

Table 12 presents the estimated cointegration coefficients in a just-identified model. Microfit gives the equation vertically. The results are uninformative because there are no asymptotic standard errors to evaluate the significance of the variables. A normalising (or exactly identifying) restriction is required to estimate (or identify) the cointegration relationship together with the asymptotic standard errors.

Table 12

Estimated cointegration coefficients

```
Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
    Cointegration with restricted intercepts and no trends in the VAR
******************************************************************************
71 observations from 1928 to 1998. Order of VAR = 4, chosen r =1.
List of variables included in the cointegrating vector:
LGPCY         CIC           G             CAB           DMB
Intercept
******************************************************************************
              Vector  1
LGPCY            -3.4524
             (  -1.0000)

CIC               .21148
             (  .061256)

G                 .033647
             (  .0097461)

CAB               .15250
             (  .044172)

DMB              -.30651
             ( -.088784)

Intercept         .50075
             (  .14505)

******************************************************************************
```

In Table 13, the estimated cointegration relationship is normalised on the coefficient of LGPCY; denoted by A1=1 representing the coefficient of LGPCY, the first variable in the cointegrating VAR. In practical terms, therefore, all co-efficients are divided by the coefficient of LGPCY. Standard errors are in the brackets below the coefficients. The maximized value of the log-likelihood function subject to exactly identifying restrictions LL ($r = 1$) = 358.3618 given at the bottom of Table 13 is identical the maximized log-likelihood value for $r = 1$ in Panel C, Table 11. This suggests the restriction is not significant and cannot be rejected. Standard errors are employed to facilitate the elimination of insignificant variables via the imposition of over-identifying restrictions.

Table 13

Normalised estimates of cointegration coefficients

```
               ML estimates subject to exactly identifying restriction(s)
            Estimates of Restricted Cointegrating Relations (SE's in Brackets)
                         Converged after 2 iterations
             Cointegration with restricted intercepts and no trends in the VAR
*******************************************************************************
71 observations from 1928 to 1998. Order of VAR = 4, chosen r =1.
List of variables included in the cointegrating vector:
LGPCY          CIC          G             CAB          DMB
Intercept
*******************************************************************************
List of imposed restriction(s) on cointegrating vectors:
A1=1
*******************************************************************************
                    Vector  1
LGPCY                   1.0000
                    (   *NONE*)

CIC                  -.061256
                    (  .020303)

G                    -.0097461
                    (  .030366)

CAB                  -.044172
                    (  .035271)

DMB                   .088784
                    (  .041160)

Intercept            -.14505
                    (  .058932)

*******************************************************************************
LL subject to exactly identifying restrictions= 358.3618
*******************************************************************************
```

The t ratios computed by dividing the estimated coefficients in Table 13 by the respective standard errors indicated that the variables G and CAB are statistically insignificant. Pesaran et al (1997, p 139) recommend one over-identifying restriction per cointegrating vector at a time. Variable G is relatively more insignificant hence is eliminated first by imposing the restriction A3 =0.

Table 14

Cointegration estimates subject to over identifying restriction

```
              ML estimates subject to over identifying restriction(s)
           Estimates of Restricted Cointegrating Relations (SE's in Brackets)
                        Converged after 2 iterations
           Cointegration with restricted intercepts and no trends in the VAR
*****************************************************************************************
71 observations from 1928 to 1998. Order of VAR = 4, chosen r =1.
List of variables included in the cointegrating vector:
LGPCY          CIC            G              CAB            DMB
Intercept
*****************************************************************************************
List of imposed restriction(s) on cointegrating vectors:
a1=1  ; a3=0
*****************************************************************************************
                  Vector  1
LGPCY                1.0000
                (   *NONE*)

CIC                - .064069
                (   .018363)

G                  - .0000
                (   *NONE*)

CAB                - .051971
                (   .025640)

DMB                  .085555
                (   .040048)

Intercept          - .14407
                (   .059010)

*****************************************************************************************
LR Test of Restrictions          CHSQ (1) = 0.10279[0.749]
DF=Total no of restrictions(2) - no of just-identifying restrictions(1)
LL subject to exactly identifying restrictions= 358.3618
LL subject to over-identifying restrictions= 358.3104
*****************************************************************************************
```

Table 14 reports the computed ML estimates of the cointegrating relationship. The results were obtained after 2 iterations. Microfit automatically generates a log-likelihood ratio (LR) statistic for testing the significance of over-identifying restrictions. This LR test statistic is computed as CHSQ (1) = 0.10279 at the bottom of Table 14. Pesaran and Pesaran (1997, p140) show that these statistics "are asymptotically distributed as χ^2 variates with degrees of freedom given by $k = r^2$, where k is the total number of restrictions and r^2 is the number of just-identifying restrictions." In this case the restriction A3 = 0 is not statistically significant because the level of the LR test statistics [0.749] is below the 95 per cent critical value of the χ^2 distribution with one degree of freedom. It follows that the restriction cannot be rejected. (Literally, the level in parentheses is compared to 0.05.) All the remaining variables in the model are statistically significant hence there is no basis for further restrictions.

As before the resultant long run relationship is given vertically in Table 14. There is a positive empirical relationship between the size of the DMB and economic activity, which is denoted by the positive coefficient of 0.086. The results suggest that an exogenous increase in the financial assets (size) of DMB has a positive effect on economic activity and vice versa. The empirical findings are consistent with the theoretical model that the financial sector matters for growth. Prima facie, the more developed the financial intermediaries in an economy the better they are able to provide information gathering, screening, monitoring, allocative efficiency, and risk management services. Reliance on financial intermediaries for credit may provide banks with an opportunity to exert better corporate governance on enterprises, *ceteris paribus*. Hypothetically, provision of these essential services enhances productivity of investment and ultimately economic growth. Screening and monitoring projects improves "total factor productivity" as argued in Easterly and Levine (2000) as well as Pritchett (2000). Before analysing the short-run dynamics of the model it is useful to consider other cointegrating vectors.

Table 15 summarises some of the cointegrating relationships identified in this study. The cointegrating vectors are presented in a horizontal format; and are labelled A to N for easy of identification. Numbers in parentheses are standard errors of the coefficients. A variety of alternative financial intermediary development indicators were employed to examine the nature of their effect on economic activity. These sensitivity analyses help evaluate the robustness of findings. Potential legal and institutional determinants of financial development were also evaluated for their effect on economic development.

Starting with indicators of financial development, the VARs yield positive coefficients on most measures of financial size. [Indicators of financial development appear in bold face in Table 15 below]. The positive signs are consistent with the prediction that a growing financial system enhances the allocation of resources and general economic performance. The coefficient on Liquid Liabilities (LQL) in Equation B, Table 15, is significant and has the right sign. When the indicator of macroeconomic activity is changed to per capita income growth (GPCY) in Equation C all explanatory variables enter the model with significant and economically large coefficients. In Equation D, the coefficient on DMRB, the ratio of DMB to RBZ, the Central Bank, is not statistically significant.

Cointegration Vector	Observations and span	Dependent Variable	Conditioning Variables and Financial Indicator Included in the Model				
Equation B	71	LPCY	CIC	G	CAB	LQL	Intercept
	1928 – 98		-0.12235	0.091481	-0.13128	0.14036	-0.18346
			[0.020651]	[0.026848]	[0.031128]	[0.030041]	[0.042385]
Equation A	71	LGPCY	CIC	G	CAB	DMB	Intercept
	1928 – 98		-0.064071	0.0	-0.051974	0.065555	-0.14407
			[0.018363]	[NONE]	[0.025640]	[0.040048]	[0.059012]
Equation C	71	GPCY	CIC	G	CAB	LQL	Intercept
	1928 – 98		-13.2186	9.2253	-13.8877	16.1195	-20.2109
			[2.2004]	[2.8156]	[3.2959]	[3.1887]	[4.4572]
Equation D	71	LPCY	G	OPEN	DMRB	Intercept	
	1928 – 98		-2.5377	5.4224	1.6302	-5.9774	
			[0.53020]	[1.7148]	[1.4070]	[0.63699]	
Equation E 1	71	LPCY	CIC	G	CAB	BKA	Intercept
	1928 – 98		-1.0395	-0.72097	0.0	5.7567	-8.0909
			[0.42938]	[0.34550]	[NONE]	[1.4076]	[0.98713]
Equation E 2	71	LPCY	CIC	G	CAB	BKA	Intercept
	1928 – 98		-0.94420	0.0	-0.87628	3.4936	-8.3572
			[0.40121]	[NONE]	[0.40247]	[1.4238]	[1.0292]
Equation F	71	LGPCY	LTECH	G	CAB	CIC	Intercept
	1928 – 98		0.032220	0.055676	-0.093530	-0.051556	-0.13795
			[0.010368]	[0.029264]	[0.034618]	[0.019450]	[0.062069]
Equation G	71	LGPCY	LTECH	G	CAB	Intercept	
	1928 – 98		0.026284	0.0	0.0	-0.037866	
			[0.0096269]	[NONE]	[NONE]	[NONE]	
Equation H	71	LGPCY	LTECH	G	CAB	CIC	
	1928 – 98		0.038426	0.037311	-0.063153	0.0	
			[0.010717]	[0.0070210]	0.029042	[NONE]	
Equation I	71	LPCY	CGV	BKA	Intercept		
	1928 – 98		4.0593	5.8362	-4.4803		
			[1.6836]	[1.9562]	[1.0176]		
Equation J	71	LPCY	WAR	CGV	BKA	Intercept	
	1928 – 98		0.12920	3.4595	5.6459	-4.4321	
			[0.42141]	[1.2047]	[1.5323]	[0.82320]	
Equation K	46	LGPCY	LTECH	WAR	RBZ	Intercept	
	1953 – 98		-0.75535	0.048124	0.80058	-0.065857	
			[0.020572]	[0.016280]	[0.17482]	[0.024256]	
Equation L	49	LGPCY	LTECH	CGV	TFA	Intercept	
	1950 –98		0.0	0.073525	0.13266	-0.029547	
			[NONE]	[0.031032]	[0.051909]	[0.010628]	
Equation M	49	LGPCY	LTECH	WAR	TFA		
	1950-98		0.0	-0.028808	0.1667		
			[NONE]	[0.011233]	[0.034488]		
Equation N	71	LPCY	G	OPEN	TREND		
	1928 – 98		-1.4493	4.0404	-0.016914		
			[0.48307]	[1.1551]	[0.0042014]		

Table 15

Summary of time series modelling results

Although the monetary base aggregate, denoted by Currency in Circulation [CIC], was found to be statistically significant, the empirical relationship with real output was found to be negative. This result is contrary to the positive relationship established in Rousseau's (1998) empirical study of Meiji-era Japan (1880-1913). The differences may be accounted for by omitted variables in Rousseau's trivariate model. Intuitively, a negative relationship between real income and the monetary base is not surprising given the high incidence of inflation tax and seigniorage revenue in less developed countries such as Zimbabwe. Thus, theoretically, expansion of monetary aggregates could be harmful to real activity. In any case, the ratio of real currency in circulation to real GDP is expected to decrease as the economy evolves over time. Figure 7 shows that the ratio of Currency in Circulation has tended to decrease at a decreasing rate since 1964. The trend has occasionally been punctured by expansion phases noted in 1980 to 1982 and 1998 to 2000.
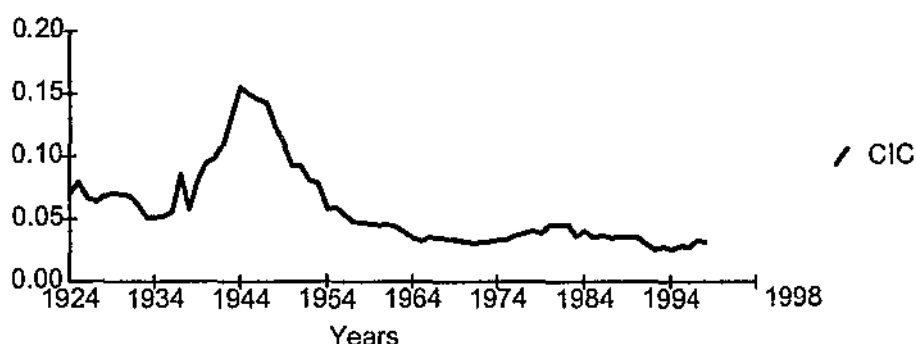

Figure 7   Currency in circulation to GDP

The econometric evidence on the relation between Government Size (G) and economic activity was found to be ambiguous. Although the coefficients on G are statistically significant, the variable enters VARs with wrong signs save for Equations D, E1 and N. Most researchers, for instance Levine, Loayza and Beck (2000, p55) and Roubini and Sala-i-Martin (1992, p19) report negative coefficients on "non-productive" government spending. It must be noted that the series employed by Roubini and Sala-i-Martin (1992, p19) excludes expenditure on defence and education.   The theoretical position is not crystal clear either. In

a Keynesian framework, government expenditure can stimulate economic activity. Persistent government deficits are, however, not sustainable. The financing of government deficits through the banking sector is known to be inflationary and detrimental to both financial and economic development. Although the government might benefit from financial repression, distorted incentive structures and price signals curtail the capacity of financial intermediaries to monitor and screen projects. The resultant decrease in total factor productivity weakens macroeconomic activity.
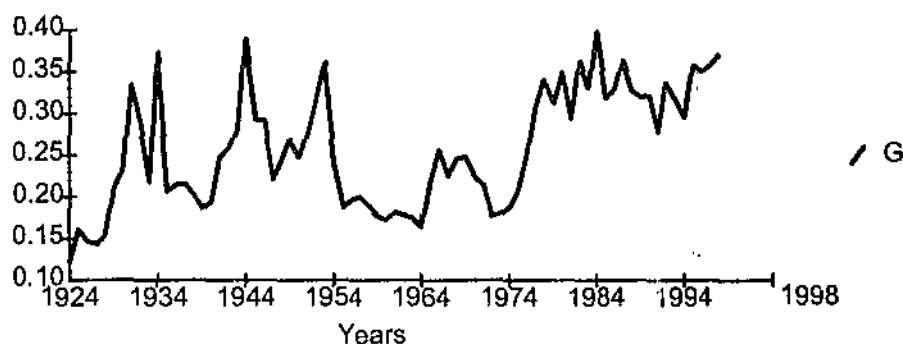

Figure 8   Government expenditure to GDP

The ratio of real Government Expenditure to real GDP in Zimbabwe is captured in Figure 8 above. Apart from the Federal decade (1953 to 1963) successive government have not resisted the temptation to increase fiscal expenditure. A high government deficit is expected to retard growth. In fact, critics partially attributed the unfolding economic crisis in Zimbabwe to fiscal indiscipline.

> By late 2000, the country was in the midst of a serious economic crisis and was saddled with a sizeable stock of public debt and external payments arrears, while usable foreign reserves had dwindled and inflation was on an upward trend. [IMF Country Report (2001, p5)]

A substantial body of research suggests that the degree of openness to international trade [OPEN], measured as the sum of real exports and real imports to real GDP, has a positive effect on economic activity. The literature on trade regimes suggests that reliance on autarky in a small economy diminishes prospects for technical progress, and allocative efficiency, while promoting rent

seeking activities. As expected, OPEN enters Equations D and N with the right sign and is statistically significant. The coefficients are economically large.

In my view, the economic gains from openness to trade presuppose favourable movements in terms of trade and current account balances [CAB]. CAB is an important conditioning variable used in this research in place of OPEN. The CAB of Zimbabwe for the period under review is illustrated in Figure 9. In order to circumvent the calculation of logarithms on negative values on the convectional CAB, the series is derived from log (exports) minus log (imports).
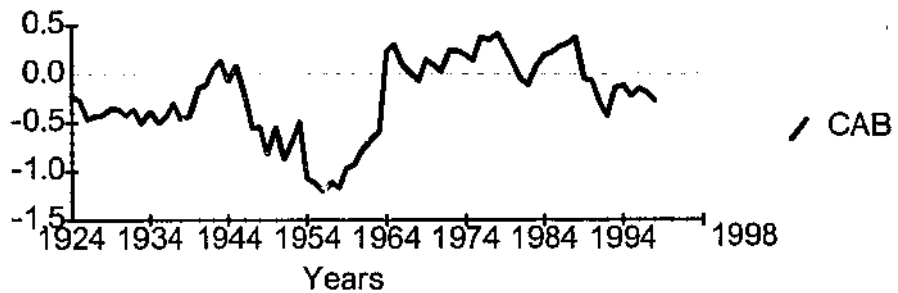

Figure 9   **Zimbabwe current account balance**

The diagram shows that Zimbabwe enjoyed a positive CAB during the Second World War when the country was challenged to support the war effort in Europe. This phenomenon was reversed during the Federal era in which massive infrastructure projects were financed by foreign resources. Import substitution programmes introduced under UDI (1965 to 1980) when the country was placed under UN sponsored sanctions brought with them a healthy CAB. From 1976 to 1980 the liberation war in the country worsened the position. The CAB only recovered at Independence in 1980 when the country was readmitted into the international community. Populist fiscal programmes reversed the situation.

Given the generally negative CAB, the variable enters Equations A, B, C, E2, F, and H with the expected negative sign and its coefficient is statistically significant. Statistically this implies that a high CAB is should lead to deteriorating economic activity in the long run. For this reason, policies that promote improved export performance, not just openness to trade, should lead to improved economic performance. It follows that economic policy in Zimbabwe must pay particular attention to the exchange rate policy, tariff policy as well as

the attendant Marshall-Lerner condition i.e. sum of elasticises of exports and imports need to be greater than one. These issues may require validation by research.

I will now turn to Long Run Structural Modelling (LRSM). It is well-known that the Johansen approach does not always result in unique cointegration vectors. In Equation E, the banking sector [BKA] comprising of the Reserve Bank of Zimbabwe, discount houses, commercial banks, and merchant banks is introduced as an alternative indicator of the degree of financial development. Two long run relationships, denoted by cointegrating vector E1 and E2, were identified. Table 16 captures the original results.

Table 16

Banking sector estimated cointegrated vectors

```
Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
      Cointegration with restricted intercepts and no trends in the VAR
*******************************************************************************
71 observations from 1928 to 1998. Order of VAR = 4, chosen r =2.
List of variables included in the cointegrating vector:
LPCY          CIC            G              CAB           BKA
Intercept
*******************************************************************************
              Vector  1      Vector  2
LPCY            -.24667        .025882
            (  -1.0000)    (  -1.0000)

CIC              .24399        .038426
            (   .98915)    (  -1.4847)

G                .083901       .47566
            (   .34014)    ( -18.3785)

CAB              .11417       -.60081
            (   .46287)    (  23.2139)

BKA            -1.1251       -1.4027
            (  -4.5613)    (  54.1973)

Intercept       2.0305       -.39198
            (   8.2316)    (  15.1452)

*******************************************************************************
```

As there are two cointegrated vectors $r = 2$, VAR requires two exactly identified restrictions on each r cointegrating vectors to begin the long run restriction iterations (See Pesaran and Pesaran pp 124 and 138). Subsequent restrictions can be introduced gradually one after another. The following restrictions were applied to normalise the vectors and eliminate unlikely variables.

$$A1 = 1; \quad A4 = 0$$
$$B1 = 1; \quad B3 = 0$$

Where A stands for the first vector, B for the second and $A1$ stands for the first parameter in vector A, etc.

LPCY is the dependent variable, therefore the vectors were normalised by LPCY. The restriction $A4 = 0$ was added to eliminate variable CAB on the basis of a wrong sign on the coefficient. The coefficient on CAB should have a negative sign as was discussed before. Earlier on it was noted that the variable G has a questionable relationship with economic performance in the model hence the restriction $B3 = 0$. The estimates converge after two iterations to give results depicted in Table 17 below.

Table 17

Banking sector exactly identified cointegration vectors

```
          ML estimates subject to exactly identifying restriction(s)
        Estimates of Restricted Cointegrating Relations (SE's in Brackets)
                       Converged after 2 iterations
         Cointegration with restricted intercepts and no trends in the VAR
*******************************************************************************
 71 observations from 1928 to 1998. Order of VAR = 4, chosen r =2.
 List of variables included in the cointegrating vector:
 LPCY          CIC            G              CAB            BKA
 Intercept
*******************************************************************************
 List of imposed restriction(s) on cointegrating vectors:
 a1=1    ; a4=0; b1=1; b3=0
*******************************************************************************
                   Vector  1       Vector  2
 LPCY                1.0000          1.0000
                 (   *NONE*)     (   *NONE*)

 CIC               -1.0395         -.94420
                 (   .42938)     (   .40121)

 G                 -.72097          0.00
                 (   .34550)     (   *NONE*)

 CAB                0.00           -.87628
                 (   *NONE*)     (   .40247)

 BKA                5.7567          3.4936
                 (   1.4076)     (   1.4238)

 Intercept         -8.0909         -8.3572
                 (   .98713)     (   1.0292)

*******************************************************************************
 LL subject to exactly identifying restrictions= 412.3368
*******************************************************************************
```

In both vectors, all variables enter the equations with expected signs and are statistically significant. There is, therefore, no statistical basis for further restrictions on the cointegrated vectors. The appropriate model can be selected

on the basis of theory. The theoretical model underlying this research posits that financial aggregates have a strong causal effect on growth. Following upon this hypothesis, vector A (EQ. E1) is chosen ahead of B as it gives the strongest relationship between financial intermediation and economic performance.

Credit aggregates are some of the widely used measures of financial development. Beck, Demirgüç-Kunt, Levine (1999) and King and Levine (1993) popularised their use. These aggregates relate real private sector credit issued by various categories of financial intermediaries to real GDP. In this research, no reliance was placed on credit aggregates for a number of reasons. The hypothesis that Private Sector Credit by DMB contains a unit root was statistically rejected. As shown in Table 9, unit root properties of PCOBI and PCDFI suggest the variables are integrated to the orders I(2) and I(3) respectively. Incorporating these variables in VAR would give rise to the spectre of spurious cointegration. I avoided the temptation to difference these series, as the practice is known to wash away the long run information contained in the original level form. Private Sector Credit by the Banking Sector (PCBK) did not contain useful information about real economic activity.

From a statistical perspective, the unit root properties of credit aggregates might have been influenced by the poor quality of the various series, which were partly constructed from second hand sources. Future researchers should strive to locate original sources such as the "Economic and Statistical Bulletin (1933 – 1954)" and the "Quarterly Bulletin of Financial Statistics" either at the National Archives or at the Central Statistics Office. The present researcher could not exhaust all possible leads as he was based in Australia at the time this research was conceived. Although I was able to visit Zimbabwe for data collection purposes the expedition lasted only two weeks.

Theoretically, credit aggregates in Zimbabwe might not contain useful information on real economic activity due to fundamental weaknesses. A series of subsidised and / or directed credit schemes have been instituted in Zimbabwe whose repayment record has been disastrous to say the least. I concur with Fry (1997, p760) that directed credit programmes increase delinquency and default rates and fragility of the financial system. Kane and Rice (2000, p5) describe "zombie banks" which are allowed to operate even when their net

207

worth has evaporated. Credit accumulation might have no relationship to economic performance, if the financial institution is all but insolvent. Given these issues there is high risk that credit aggregates may not bear any relationship real asset values. Although difficult to swallow, financial repression continues to thrive in Zimbabwe. The constraints distort price signals, and factor productivity.

8.2 Selected institutional determinants of development

The institutional environment in which financial institutions must operate influences prospects for financial development and by extension economic activity. In order to assess the econometric importance of proxies for the institutional framework, the variables were introduced one at a time. To start with, indicators of financial development were temporarily removed from the model. This approach allows for the direct evaluation of the informational content of environmental proxies in their own right. The practice also curbs fast exhaustion of degrees of freedom in VARs by minimising prospects for over parameterisation.

Before proceeding, it must be noted that not all potentially useful legal and institutional variables are amenable to vector autoregressions. In section 5.3 it was noted that some indicators such as legal origin maybe time invariant hence not informative in time series analysis based on a single country. This section thus zeros in on those variables that can realistically vary with time.

In Section 5.3, this thesis proposes the logarithm of telephone lines per capita (LTECH) as a new surrogate for dynamic efficiency. In recent years financial innovations, including point of sale, telephone banking, automated teller machines (ATMS) as well as e-banking, have increasingly become reliant on informational technologies. Lynch (1993, p15) argues that financial development should be reflected in increased sophistication of financial products, efficient pricing, and reduction in information asymmetry. Van Horne (1985) argues that true financial innovations make the market more efficient and / or more complete. Increased choice would suggest increased market completeness. Financial instruments, like market products facilitates price arbitrage across time, markets and countries. In a small developing economy such as Zimbabwe, LTECH approximates the market's capacity to adopt new technology or ideas.

In order to test the hypothesis that the rate of technological use affects economic activity, the variable LTECH is introduced into a number of VARs. In Equation 20, the coefficient on LTECH has the expected sign and is statistically significant. The hypothesis is accepted. The standard errors are in parentheses.

$$\text{LGPCY} = 0.032029\ \text{LTECH} + 0.054199\ \text{G} - 0.092516\ \text{CAB} - 0.050581\ \text{CIC} \qquad (20)$$
$$[0.010359] \qquad\qquad [0.029072] \qquad [0.034535] \qquad [0.019275]$$

As a starting point, no allowance has been made for intercepts and trends. The initial coefficient on G, however, is not statistically significant. The model in Equation 20 was then expanded to include restricted intercepts. Equation F, in Table 15 above, gives the revised estimates. The vector autoregressions yield a slight improvement on importance of G (t ratio increases from 1.86 to 1.90) but the variable remains marginally insignificant.

In Equation 21, the coefficient on variable G is restricted to zero, and the monetary sector [CIC] is excluded from the model to assess the robustness of the VARs results. The results show that LTECH significantly affects economic activity but the current account balance [CAB] is now statistically insignificant.

$$\text{LGPCY} = 0.031720\ \text{LTECH} + 0.00\ \text{G} - 0.036713\ \text{CAB} - 0.048000\ \text{Intercept} \qquad (21)$$
$$[0.0092560] \qquad\qquad [\text{NONE}]\ \ [0.020571] \qquad [0.009178]$$

If the coefficient on CAB is restricted to zero, the variable LTECH is still statistically significant. Equation G, in Table 15, gives the relevant estimates.

In an artificial model without intercepts and trends, a vector autoregression model involving LGPCY, LTECH, G, CAB and CIC had statistically significant coefficients except for the CIC, the monetary base. The respective coefficients together with the standard errors are reported in Equation 22.

$$\text{LGPCY} = 0.041915\ \text{LTECH} + 0.077472\ \text{G} - 0.098965\ \text{CAB} - 0.016867\ \text{CIC} \qquad (22)$$
$$[0.010395] \qquad\qquad [0.030716] \qquad [0.038151] \qquad [0.012599]$$

Although Equation 20 has identical variables with Equation 22, the parameters are different because the former model incorporates unrestricted intercepts, whereas the cointegration relationship in the later contains no intercepts or trends. Variable CIC is rendered statistically insignificant in Equation 22. This result provides a statistical justification to restrict the coefficient on CIC to zero. Equation H, in Table 15 above, gives the resultant estimates. All the remaining variables are statistically significant. In classical theoretical para-

digms, insignificant monetary aggregates support the monetary neutrality view. There is no basis to draw strong conclusions to this effect in this study.

Other important preconditions for financial sector development are macro-economic stability and sound regulation. I agree with Lynch (1993, p12), however, that the financial system thrives "upon expectations, not regulation..." Confidence or trust, whether fostered by good reputation, good governance, and / or contract enforcement is a key ingredient in financial intermediary development. Given these issues, institutional variables that affect expectations and confidence should be potentially informative about both financial and economic development. Periods of armed conflict [WAR] and change in government [CGV] often bring with them sharp changes in perceptions.

In what follows in this sub section, I will briefly consider these proxies. Equation I, in Table 15, duplicated as Equation 23 for exposition purposes, suggests that both CGV and the banking sector [BKA] have a positive relationship with economic activity. The coefficients on CGV and BKA are statistically significant and economically large. Intuitively, the sign on the coefficient of CGV is at best ambiguous. On one hand too much change in government might be a source of instability and uncertainty, hence could negatively impact on economic activity. On the other hand, if governments are elected into office on the basis of expected performance, an occasional change in government is implicitly a function of the highest collective expected return.

$$LGPCY = 4.0593\ CGV + 5.8362\ BKA - 4.4803\ \text{Intercept} \qquad (23)$$
$$[1.6836] \qquad [1.9562] \qquad [1.0176]$$

Equation J, in Table 15, expands on Equation 23 via addition of the variable WAR. The results in J suggest that WAR is the only uninformative variable in the model. A different picture is portrayed in Equation K, represented by Equation 24 below. Although all the variables are statistically significant, the signs on the coefficients of LTECH and WAR appear to be reversed. There is no theoretical justification for the empirical relationship demonstrated therein.

$$LGPCY = -0.075535\ LTECH + 0.048124\ WAR + 0.80058\ RBZ - 0.065857\ \text{Intercept} \qquad (24)$$
$$[0.020572] \qquad [0.016280] \qquad [0.17482] \qquad [0.024256]$$

In Equation 25, corresponding to Equation L in Table 15, the coefficient of LTECH is restricted to zero, and Total Financial Assets [TFA] represents the

financial intermediary sector. To be precise, TFA is a summation of the assets of RBZ, DMB, OBI, insurance, and the Zimbabwe Development Bank (ZDB).

$$LGPCY = 0.00\,LTECH + 0.073525\,CGV + 0.13266\,TFA - 0.029547\,Intercept \qquad (25)$$
$$[NONE] \qquad [0.031032] \qquad [0.051909] \qquad [0.010628]$$

The coefficients of all variables in the model appear to have correct signs and are statistically significant. The LR test suggests the restriction on LTECH cannot be rejected. LTECH, therefore, seems not to be very informative when used simultaneously with indicators of financial development. Computations obtained in Equation M provide further support to this conclusion. To begin with, the coefficients on variable LTECH and the intercept were noted to be statistically insignificant. LTECH remained statistically insignificant when the intercept was restricted to zero. Lastly the LR Test on restrictions on both LTECH and the intercept cannot be statistically rejected.

8.3 Exploratory remarks on financial efficiency

There are no adequate time series data to assess the efficiency of the Zimbabwean Financial System in a vector autoregression framework. Thus, this section turns to descriptive and graphical techniques to draw insights on the efficiency of the financial system. In section 5.2, reference was made to three forms of financial system efficiency discussed in The Campbell Committee's (1981) Final Report. Briefly these are allocative efficiency, operational or technical efficiency, and dynamic efficiency. This section focuses on technical efficiency, which is typically assessed using bank level accounting data. Kam Hon Chu (1999, p754), for instance, uses profitability measures such as returns on assets (ROA), deposits (ROD), loans (ROL), and net worth (ROK) as proxies for bank quality. Other standard indicators of performance used in the banking profession include the net interest margin (NIM); overhead costs etc. Bank level data is not readily accessible in Zimbabwe. As a result, much of what follows relies on interest trends and spreads.

Positive real interest rates are a fundamental precondition of financial development. Lynch (1993, p12-14) regards real deposit interest rates as the most important financial prices. Efficient pricing mechanisms are responsive to changing economic conditions. In Zimbabwe, the real interest rate on commer-

cial banks' three months saving deposits has generally been negative over time. The trends in real commercial bank deposits rates (CMDR) captured in Figure 10, suggests that pricing mechanisms in the Zimbabwean Financial System are inefficient. The difficult macroeconomic conditions experienced in the years 1991/2 and 1998 to 2000 witnessed acute decreases in real deposit rates. For instance, CMDR was about – 27.09% in 1992 and – 30.8 % in 2000.
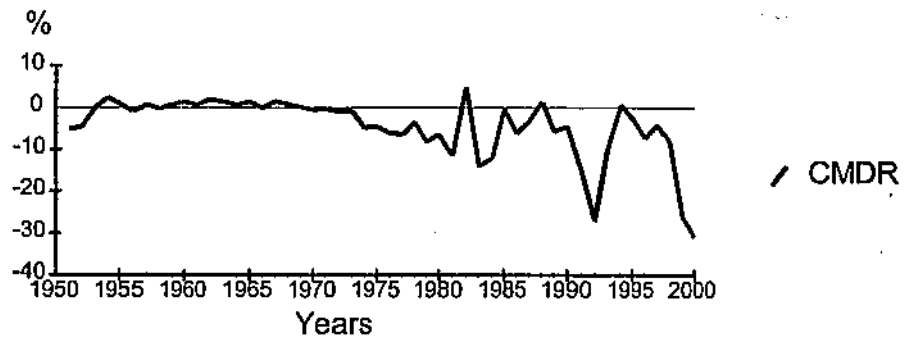
Sources: Reserve Bank of Zimbabwe (RBZ); Central Statistic Office (CSO). Real interest rates are own computations.

Figure 10   Trends in commercial banks' real deposit rates

Negative real deposit interest rates on savings are not confined to commercial banks alone. Government has, by direct regulation, kept the nominal interests rates at building societies and the POSB at artificially low levels. Building societies and the state owned POSB are in direct competition as they are exposed to similar interest rates and target the same deposit base.
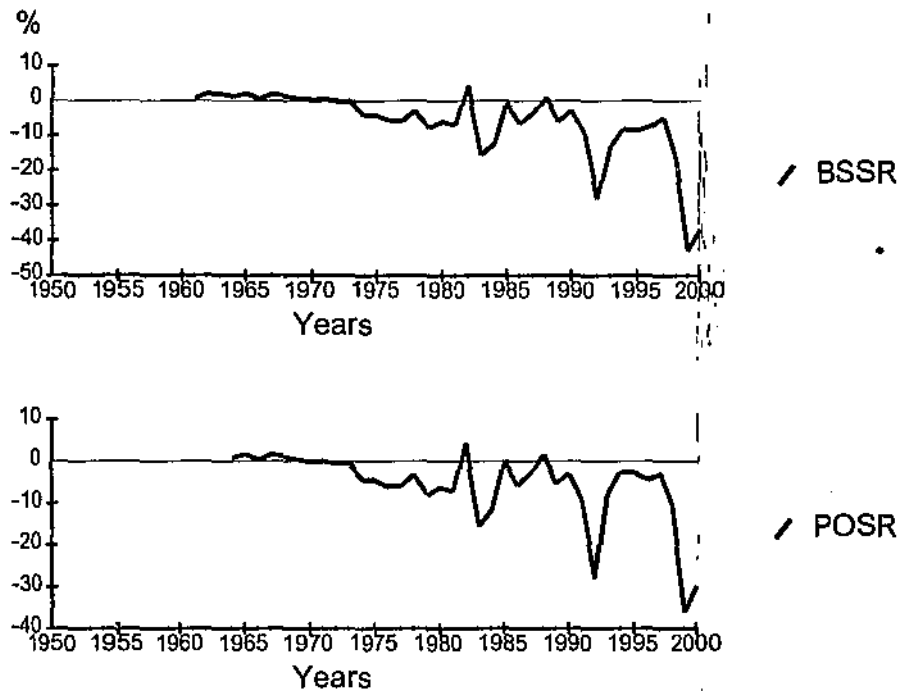
212

Sources: Reserve Bank of Zimbabwe (RBZ); Central Statistic Office (CSO). Real interest rates are own computations.

Note: The upper deposit rate has been used where rate bands are quoted.

Figure 11   Trends in other real interest rates for savings

Figure 11 shows the declining trend in real interest rates paid on saving deposits placed with building societies (BSSR) [top half] and the POSB (POSR) [bottom half]. The trends depicted by real interest rates suggest that "investors" loose value rather than preserve money placed in savings deposits. It seems to me interest rates are not related to economic fundamentals and inefficient. This confirms the view that small depositors subsidise government, banks, or both.

The spread between nominal deposit and lending interest rates is also indicative of the degree of financial development. According to Gurley and Shaw (1956, p259) the margin between financial intermediaries' borrowing and lending rates is their "compensation for the special services they supply." Lynch (1993, p14) reiterates that a large discrepancy between nominal and real interest rates as well indicates "a failure of interest rates to adjust fully to changes in inflation expectations." An efficient or developed financial system requires low transaction costs. Margins in efficient markets are low and turnover high to support optimal financial deepening. In the Zimbabwean context, the margin be-

tween nominal deposit and lending rates (MGN) for commercial banks has been increasing since economic liberalisation in 1990. Figure 12 below for provides graphical details of the trend. Between 1950 and 1970 the spread was pegged within the range of 2.5 to 3.5 percentage points. The margin rose from 4.5 in the 1970s to 4.75 percentage points in the 1980s. And by year 2000 the margin had gone up to 60.5 percentage points. Low margins prior to liberalisation, suggest suppressed market forces rather than a once were efficient financial system.

%ge points
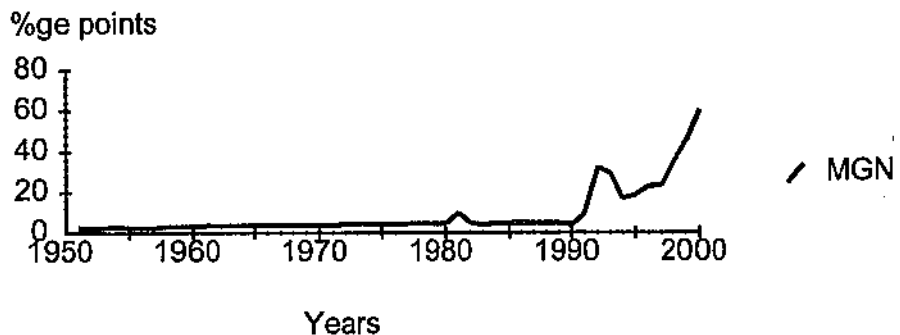
Sources: Reserve Bank of Zimbabwe (RBZ)
Note: The upper lending rate limit and lower deposit rate are used where rate bands are quoted.

Figure 12   Spread between deposit and lending rates

The traditional measures of financial institutions efficiency discussed in this section so far are imperfect standards upon which to rank the intensity of focus with which the financial system supports real activity. According to Schumpeter (1936, p126) "the main function of the money or capital market is trading credit for the purpose of financing development." In his view the "pulse" of aggregate economic activity is first and foremost reflected in the money and capital markets.

> The money market is always, as it were, the headquarters of the capitalist system, from which orders go out to its individual divisions, and that which is debated and decided there is always in essence the settlement of plans for further development. All kinds of credit requirements come to this market; all kinds of economic projects are first brought into relation with one another, and content for their realisation in it; all kinds of purchasing power, balances of every sort, flow to it to be sold. (Ibid)

Given these issues, I hereby propose a new measure of efficiency, which presumably reflects the degree to which financial institutions support real activity. Mathematically, Equation 26 below gives the new surrogate of efficiency:

$$DRIFT = \frac{Excess\ Liquid\ Assets}{Private\ Sector\ Credit} \quad or \quad \frac{Excess\ Liquid\ Assets}{Loans\ and\ Advances} *100\% \qquad (26)$$

By way of justification, it will be remembered that Private Sector Credit (PSC) is one of the several measures of the "activity" of financial institutions. I will assume PSC, unlike total deposits for instance, embodies the mechanisms with which a financial system applies financial resources to real activity. Being an absolute measure of activity, it does not capture leakages or efficiency of the financial intermediaries. In Equation 26, excess liquid assets (ELA) represent resources not channelled to the productive or real sector.[x] In practical terms, ELA are determined by the difference between actual liquid assets and prescribed liquid assets. This definition assumes regulatory authorities know the right amount and type of liquid assets required to guarantee financial safety. In general liquid assets of the Zimbabwean commercial banks, for instance, comprise of (i) notes and coin, (ii) balances with the central bank, (iii) money at call with discount houses, and (iv) bills which may be Treasury, Trade, Parastatal, Municipal, and Cental Bank in origin. In a developing economy such assets are more beneficial to government rather than financing real sector development.

It is my proposition that low values of DRIFT provide evidence of greater focus on financial intermediation activities beneficial to real activity and vice versa. In theory DRIFT is an appropriate measure of efficiency at least in developing countries where loans and advances are the major source of external finance. In these economies the market for sophisticated financial products such as derivatives, commercial paper, etc. is not fully developed. Holmström and Tirole (1997) provide theoretical support that SMEs, which dominate developing economies, naturally depend on banks for credit.

---

[x] "Money hoarded is seldom well spent," advises Bartlett (1987,p64). In Myers and Rajan (1998) a very liquid stock increases managerial discretion and thus increases agency costs. There are well-known agency problems and moral hazard issues raised in financial literature against idle resources. Idle resources encourage managers to indulge in effort aversion, and craft schemes that hinder the development of the market for corporate control. In Diamond and Rajan's (1998) model, bank managers do not create value but merely redistribute cash flows once the loan is made. Therefore excesses liquid assets have potential to decreases allocative, technical and dynamic efficiency.

A word of caution is proper. There is a hotly disputed trade off between financial stability and efficiency. Excess liquid assets are not necessarily idle resources. It is generally agreed that the main distinction between commercial banks and other financial institutions lies in the fact that liabilities of commercial banks act as a media of exchange. Gurley and Shaw (1955, p262) exude,

> As intermediaries, banks buy primary securities and issue, in payment for them, deposits and currency[y]. As the payment mechanism, banks transfer title to means of payment on demand by customers. ... As managers of the payments mechanism, banks cannot afford a shadow of insolvency. As intermediaries in a growing economy, the banks may rightly be tempted to wildcat.

Solvency and liquidity of the financial intermediaries is valuable to the stability of the payment system. A high stock of liquid assets thus guarantees the safety of a financial institution. Although a high stock of liquid assets is associated with agency problems and moral hazard issues, Calomiris and Khan (1993), cited in Freixas and Rochet (1997, p17) on the contrary consider the "immediate withdrawability", that is ability to withdraw demand deposits on sight, as an adequate tool for disciplining managers.

For practical purposes high liquidity may be associated with prudent banking. Kam Hon Chu (1999, p754) uses liquid assets as a proxy for the proportion of risk-free assets held. Such an approach is based on a free market separating equilibrium where "a good bank signals its quality by offering a lower deposit rate and holding a higher proportion of liquid, risk free assets than a bad bank," (Ibid, p749). However, I agree with Goodhart (1988) who argued that in both the real and asymmetrical world, a higher rate of return signals either greater efficiency or greater risk. The market for lemons (i.e. second hand cars) modelled in Akerlof (1970), in which low quality cars drive out high quality cars, demonstrates that quality is difficult to observe. The true condition of financial institutions is even more difficult to evaluate. In banking circles, poor accounting standards; poor corporate governance; lack of accountability and transparency could disguise the level of non-performing loans and hence the true financial

---

[y] I however, agree with Clarke (1986, p53 n5) who challenges accuracy of the view that primary securities are only issued by non-financial institutions since banks can access the capital markets should they wish and are authorised by regulatory authorities to be listed on the stock exchange.

216

condition of the institution. In developing countries there is however no reliable long series of bad debt provisions.

To recollect, I have proposed that holding excessive liquid assets is a sign of inefficient intermediation. The measure focuses on excess liquidity rather than liquidity per se. This type of inefficiency, labelled DRIFT for easy of identification, is given by the ratio of excess liquid assets (ELA) to Loans and Advances and expressed as a percentage. The Zimbabwe financial system is hereby evaluated against the new concept of inefficiency being hypothesised.

Figures 13 to 16 set out the empirical measures of inefficiency, characterised as DRIFT, of the selected four financial institution categories. Analysis of the graphs indicates that the ratios of ELA to Loans and Advances of commercial banks (CELA), merchant banks (MELA), finance houses (FELA), and building societies (BELA) met with different but not entirely distinct experiences. The empirical evidence suggests that between 1975 and 1980 commercial banks and merchant banks (Figures 13 and 14) were not intensely focused on the type of financial intermediation envisaged to be beneficial to real activity. DRIFT was as high as 108.99% and 98.86% in 1975 and 1980 respectively for merchant banks. The respective DRIFT in commercial banks was 23.91% and 27.91%. The two types of institutions were more focused between 1981 and 1990. DRIFT was on average 8.37% for commercial banks and 15.36% for merchant banks. From 1986 to 1991 merchant banks had a DRIFT below 10% except for 1987 when a DRIFT of 10.58% was registered. Following introduction of the Economic Structural Adjustment Programme (ESAP) in 1990, DRIFT on average remained low among commercial and merchant banks. Evidence based on the available data suggests that the situation changed dramatically from 1994 following the partial liberalisation of the capital account. Introduction of foreign currency denominated accounts (FCAs), market determined exchange rate, reduction in exchange controls, and the opening up of the ZSE to foreign investors brought with them new opportunities for the banks. All categories of financial institutions had more incentives to pursue lucrative investments in the money market at the expense of traditional loans and advances. This trend was more discernible in the memorable year of 2000, in which exorbitant interest rates fuelled a resurgent money market, at a time the real sector faced

near collapse. A controversial interest regime was introduced by regulation in 2001.
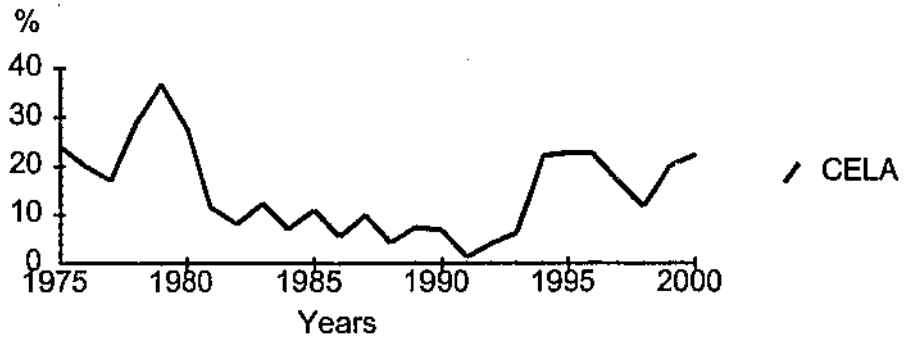
Sources: Reserve Bank of Zimbabwe (RBZ)

**Figure 13   ELA to loans and advances: commercial banks**
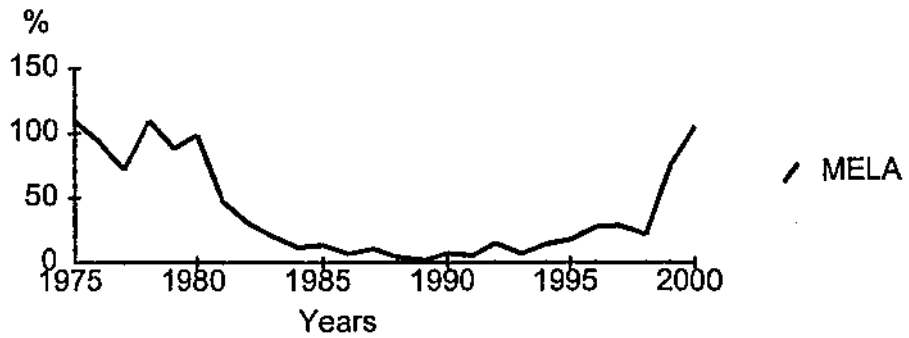
Sources: Reserve Bank of Zimbabwe (RBZ)

Figure 14   Excess liquid assets to loans and advances: merchant banks

The interest regime introduced in 2001 is outside the scope of this analysis. This said, its time to train my attention on finance houses and building societies. The empirical experiences of these financial institutions are captured in Figures 15 and 16. In comparative terms, DRIFT was low in both finance houses and building societies relative to commercial and merchant banks prior to 1994. For the period under review, 1975 to 2000, finance house DRIFT has always been below 10%. The evidence suggests that finance houses have on average increased their support of real activity. Figure 15, however, shows that finance houses could not resist the temptation to join the financial-sector-wide shift to money market activities between 1998 and 2000.

218

Building societies had great focus on financing real activity prior to 1993. From 1975 to 1985 DRIFT was on average 6.08%. First signs of departure were registered between 1986 and 1989 when on average DRIFT rose to 11.40%. Following ESAP, there was a significant shift to monetary instruments.
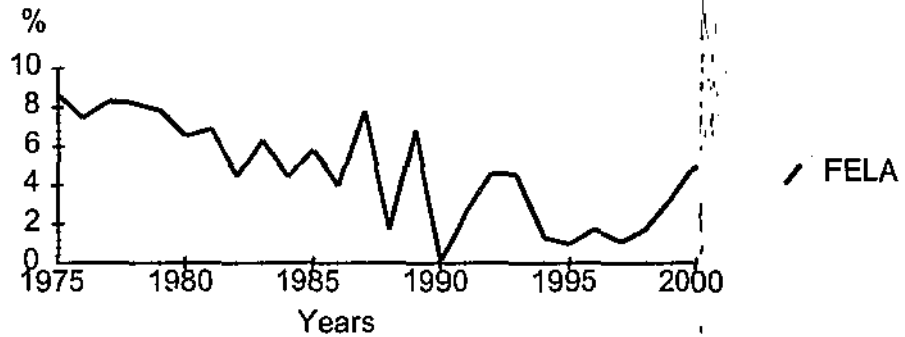

Sources: Reserve Bank of Zimbabwe (RBZ)

Figure 15   Excess liquid assets to loans and advances: finance houses
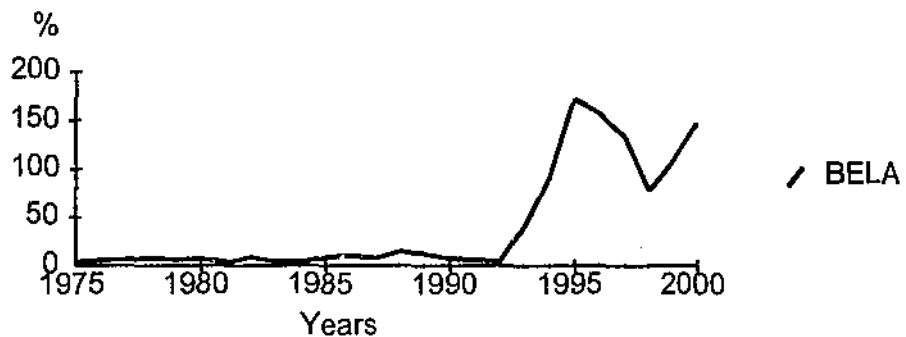
Sources: Reserve Bank of Zimbabwe (RBZ)

Figure 16   Excess liquid assets to loans and advances: building societies

The trends in commercial and merchant bank DRIFT appear to be inversely related to developments in real GDP. [This is a descriptive comparison, and no causality is being suggested.] In Figure 17 GDP was on a downward trend from 1975 to 1978. In real terms the decade 1980 to 1990, was on average a period of prosperity. The Economic Structural Adjustment Programme [ESAP] (1990 to 1995) was accompanied by economic stagnation in real terms. There was a sharp decrease in economic activity for the period 1998 to 2000.
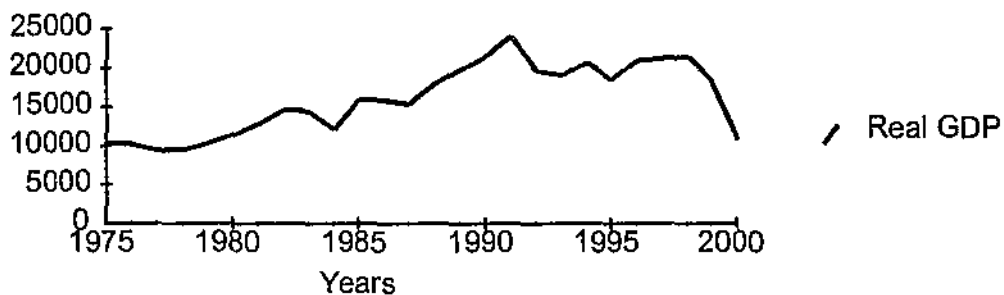
Sources: Reserve Bank of Zimbabwe (RBZ), Central Statistics Office (CSO)

Figure 17   Trends in real GDP: 1975 – 2000

The Reserve Bank of Zimbabwe bases the Liquid Asset Requirements (LAR) on the respective institution's liabilities to the public as at previous month end. Table 18 itemises the prescribed LAR requirements and the actual liquid asset ratios of the respective institutions. From 1975 to mid 1978 commercial banks in Zimbabwe had liquidity ratios of 30 to 40 % against a prescribed limit of 25 %. The RBZ was compelled to increase the minimum ratio to 35 % in May 1979 when the commercial banks' liquid assets rose to 45 %. The intention then was to reduce domestic credit expansion. Merchant banks had actual holdings ranging from 40% to 70% against a 20 % statutory base. In contrast, the average LAR of finance houses was 23 % against a base limit of 20%.

It is wrong to suggest that banks strive to keep a healthy buffer between the prescribed and actual LAR. High statutory ratios of the 1980s were accompanied by wide margins typical of the late 1970s. Although the prescribed LAR decreased dramatically to 10% in 1991 no corresponding buffer was witnessed until the advent of financial liberalisation in 1994. High nominal interest rates from 1999 to 2000 led to huge gaps between the prescribed and actual LARs.

Table 18

Required reserves and liquid asset ratios – percentages

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
RRR:																										
DMB																				17.5	17.5	20.0	20.0	25.0	30.0	30.0
FH																				4.0	4.0	4.0	4.0	5.0	5.0	5.0
LAR:																										
Commercial:																										
Prescribed	25	25	25	25	35	35	35	35	30	40	40	40	40	40	40	40	10	10	10	10	10	10	10	10	10	10
Actual	40	37	35	41	53	48	42	40	37	44	46	44	45	42	44	44	11	13	15	29	31	26	27	23	31	25
Merchant:																										
Prescribed	20	20	20	20	30	30	30	30	30	40	40	40	40	40	40	40	10	10	10	10	10	10	10	10	10	10
Actual	61	60	49	63	64	60	52	44	44	47	48	46	49	43	41	47	18	25	36	82	82	106	82	87	116	66
F/ Houses:																										
Prescribed	15	15	15	15	15	15	20	20	20	20	20	20	20	20	15	15	10	10	10	10	10	10	10	10	10	10
Actual	22	20	22	22	22	21	26	24	25	24	25	24	27	22	22	15	13	15	15	12	11	12	11	12	18	15
B/Societies																										
Prescribed	15	15	15	15	20	20	20	20	20	15	15	15	15	15	15	15	10	10	10	10	10	10	10	10	10	10
Actual	18	19	20	21	25	25	23	27	23	18	22	23	21	25	24	20	15	13	36	55	67	65	81	51	62	75

Sources: Reserve Bank of Zimbabwe (RBZ) QESR Vol. 22 No. 3-4; International Monetary Fund [IMF] (2001) Country Report No. 01/13, p65.

Notes: RRR = Required Reserve Ratio; DMB = Demand Deposit Banks; FH = Finance Houses; LAR = Liquid Asset Ratio; Commercial = Commercial Banks; etc. The base for LAR is liabilities to the public since May 1981(IMF advises). In contrast, the base for DRIFT is either private sector credit or loans and advances.

In January 2001, controversial regulations by monetary authorities forced the collapse of money market rates from about 80% to below 20%. This time around no changes were made to the statutory LAR. The RRR for demand deposit banks was, however, increased to 50% of total current and call deposits; and 20% of savings and fixed deposits. Furthermore, a credit scheme was put in place by the Reserve Bank of Zimbabwe to prop up the real sector rather than curtail credit expansion. The statutory reserves placed with the Central Bank were made available to participating institutions for on lending to the export sector at 15% and the balance to the productive sector at 30%. Although it is too early to evaluate the merits and shortcomings of the "Statutory Reserves Facility", early indications are that the forced collapse of money market interest rates to levels several times below the rate of inflation fuelled speculative activity on the Zimbabwe Stock Exchange (ZSE).

For the stock market, measures of efficiency include stock traded value to GDP, TVT for short; and the turnover ratio (TOV), i.e. turnover value to market capitalisation. To start with, the absolute size of the stock market, as measured by market capitalisation to GDP (SMC) in real terms is illustrated in Figure 18. Very briefly, the stock market nearly collapsed in 1984 when market capitalisation fell to 0.04% of real GDP. Except for the drought-induced dip in 1992, the 1990s were periods of increased activity. Opening up of the market to foreign investors from 1994 facilitated increased activity on the market.
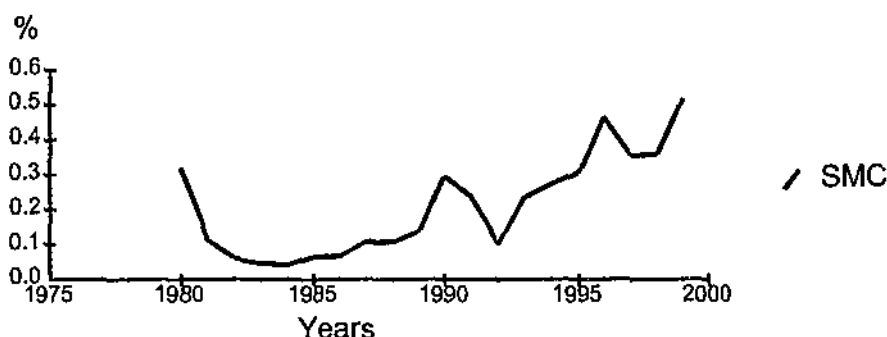

Sources: IFC "Emerging Stock Markets Factbook" – various; The ZSE "The Investor s' and financial Markets Handbook" – Issue Four

Figure 18   Stock market capitalisation to GDP

222

Academic work on market microstructure theory measures stock market efficiency in terms of market liquidity. Typical dimensions of market liquidity are tightness, depth and resiliency. The Bank of International Settlements [BIS] (1999, p14) defines tightness as the gap between quoted prices and transaction prices. The quoted spreads are based on the quoted bid and ask prices, whereas the effective spread relates to the actual transaction prices. Market resiliency "refers either to the speed with which price fluctuations resulting from trades are dissipated, or the speed with which imbalances in order flows are adjusted, (Ibid, p13)." Tightness and resilience are mentioned herein for completeness because there is no readily available data to empirically evaluate the tightness and resilience of the Zimbabwe Stock Exchange.

According to the BIS, depth has two attributes: (1) the amount of orders at a given time or (2) the volume of trade which can be undertaken without affecting prevailing prices. The usual proxy for market depth is given by turnover values per given period of time. Figures 19 and 20 capture some common measures of stock market efficiency for the ZSE. Although total stock value traded to GDP (TVT) has risen from 0.0012% in 1984 to 0.048 % in 2000, the proportion is still very insignificant.

**Figure 19   Total value traded to GDP**

Buoyed by independence in 1980, international goodwill, and the resultant lifting of UDI era sanctions, the equities industry registered a stock market turnover (TOV) of 19.2%, 17.48%, and 12.97% in 1981, 1982 and 1983 respectively in contrast to 8.8% recorded in 1980. The retention of Rhodesian era strict

exchange controls barring foreign investors from the bourse, a civil war, and fiscal imprudence shot down the euphoria. The period 1984 to 1993 was characterised by stock exchange inactivity with an average turnover of 3.18%. Financial liberalisation initiatives introduced in 1994 breathed a new lease of life on the Zimbabwe Stock Exchange. Early successes include the listing of the mining giant, Ashanti Goldfields in 1996. Since then there are signs that the ZSE is increasing its contribution to economic activity.
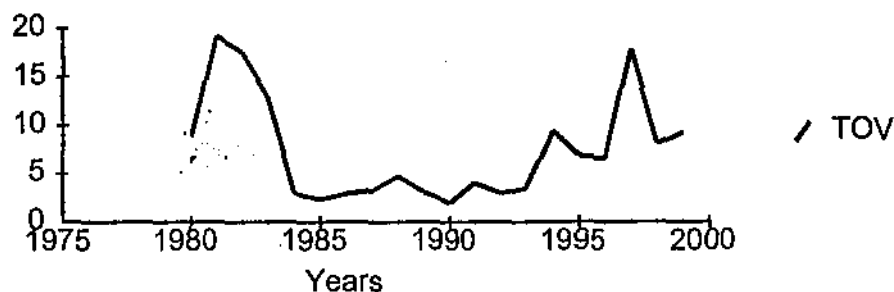
Figure 20   Stock market turnover 1980 - 2000

Bayoumi (1999, pp 5 and 35) employs the real stock prices computed by dividing the main stock index by the GDP deflator as a determinant of real activity. Figure 21 charts the profiles of the Zimbabwean Industrial Price Index (IPI) and the Value Traded Index (VTI) in real terms. The emerging pattern points to increasing economic activity from 1960 to 1975, 1980 to 1981, 1990, and 1994 to 2000. Economic expectations were low from 1976 - 9 and 1983 to 1987.
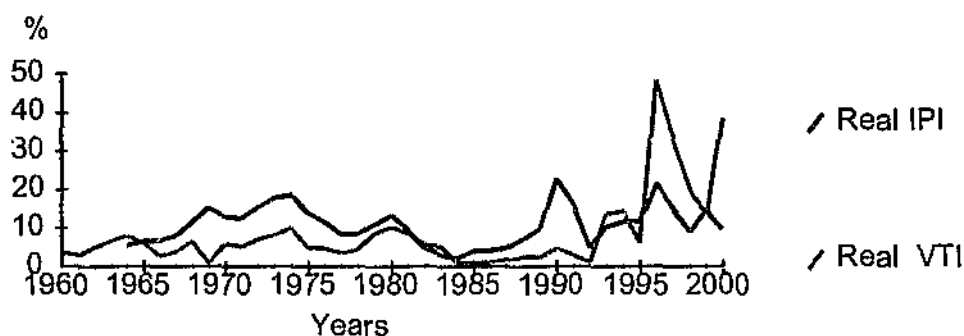
Figure 21   Real Industrial Price Index and Value Traded Index

8.4 Short run dynamics

Having dwelt at length on long run empirical regularities that character-ises the Zimbabwean Financial System, it remains essential to analyse the econometric importance of the model's short run dynamics. There are too many permutations in this direction, given the number of cointegrating vectors esti-mated through VAR analysis in sections 8.1 and 8.2. This research selects a few cointegration relationships for discussion due to space limitations. Precisely this section will initially be confined to Equations A, B, and E from Table 15.
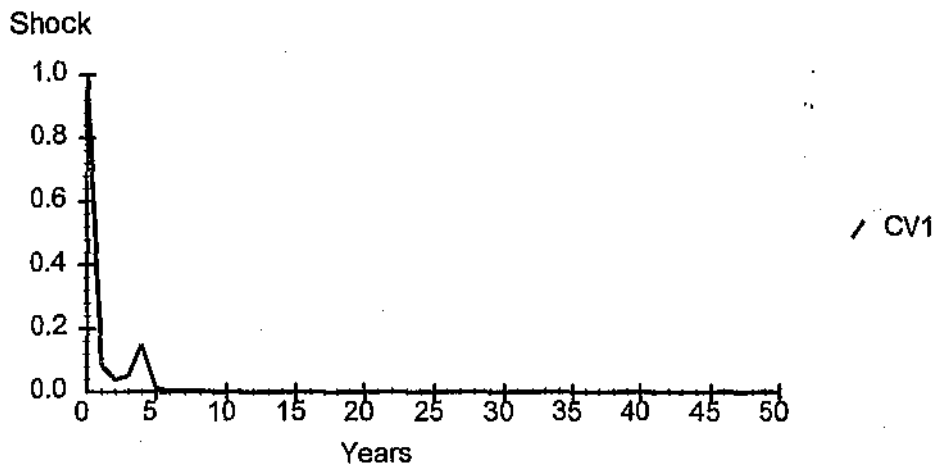
Shock

**Figure 22   PP of the effect of a system-wide shock to Equation A**
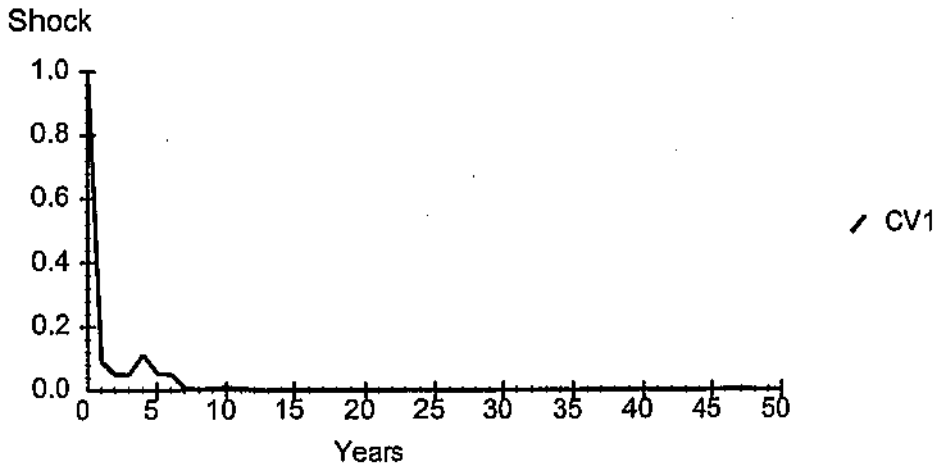
Shock

Figure 23   PP of the effect of a system-wide shock to Equation B
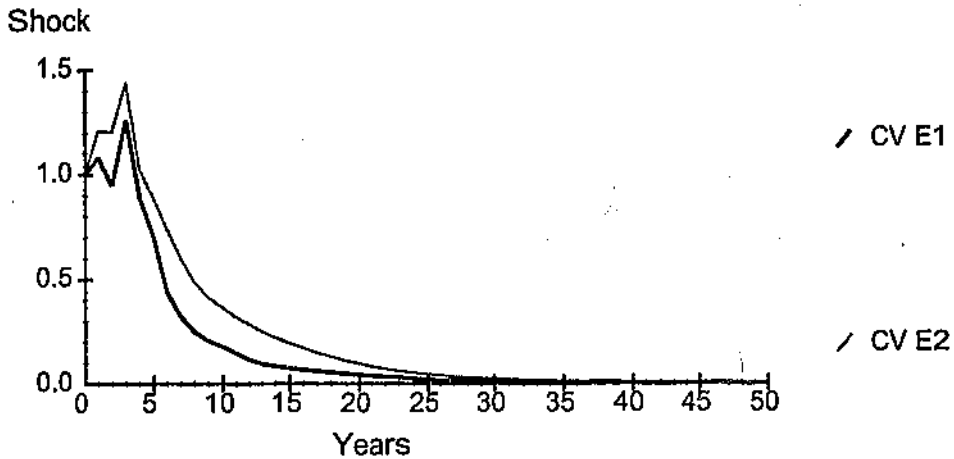
Shock

Figure 24   PP of the effect of a system-wide shock to Equation E

Figures 22 to 24 plot the persistence profiles (PP) of the effect of a system-wide shock to the respective equations to examine the length of time it takes the different systems to return to the equilibrium relationship. Figure 22 indicates that Equation A converges after 5 years. About 85 % adjustment occurs in Year 1. Equation B, which substitutes DMB in Equation A with LQL as the financial intermediation indicator takes about 7 years to eliminate the effect of a system-wide shock. Turning attention to Figure 24, which incorporates different indicators for both macroeconomic activity and financial intermediation reveals that shocks are more persistent. It takes cointegrating vectors (CV) E1 and E2 approximately 25 and 30 years respectively complete the adjustment.

In the interest of lucidity and brevity, I will henceforth focus on Equation A to analyse the short run dynamics of the model. In Figures 25 to 29 the Generalised Impulse Response (GIR) analysis is employed to determine the effect of variable or equation specific shocks on the cointegrating vector A. More specifically, the Figures plot the GIR of a unit, that is one standard error (S.E.), shock on LGPCY, CIC, G, CAB, and DMB respectively upon the model. No upper and lower bands were considered. The negative impact of a shock in macroeconomic activity, LGPCY in Figure 25, lasts for about 6 years. A one standard deviation in either the monetary base (CIC) or government size (G) leads to a positive impact on the cointegrating vector. The greatest improvement is within the first five years although the shock persists for about 12 years. A unit shock on the trade sector, CAB, takes about 15 years to completely dissipate.
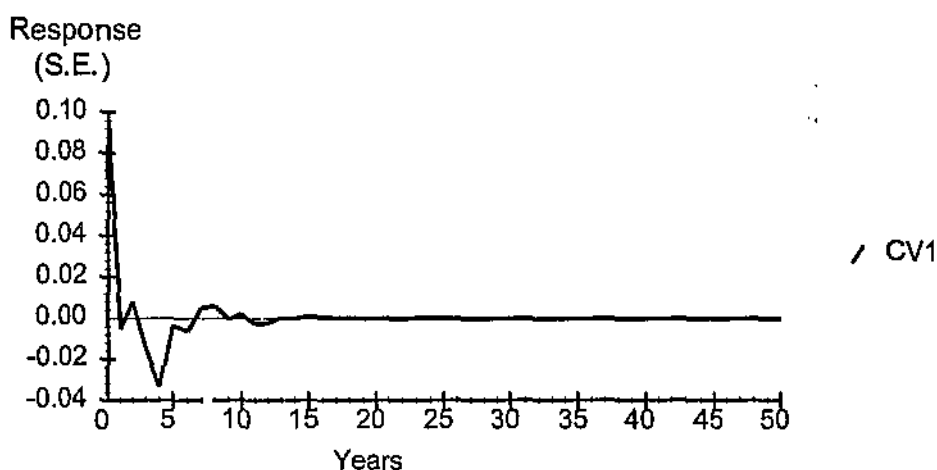
Response (S.E.)

Figure 25   GIR to one S.E. shock in the equation for LGPCY
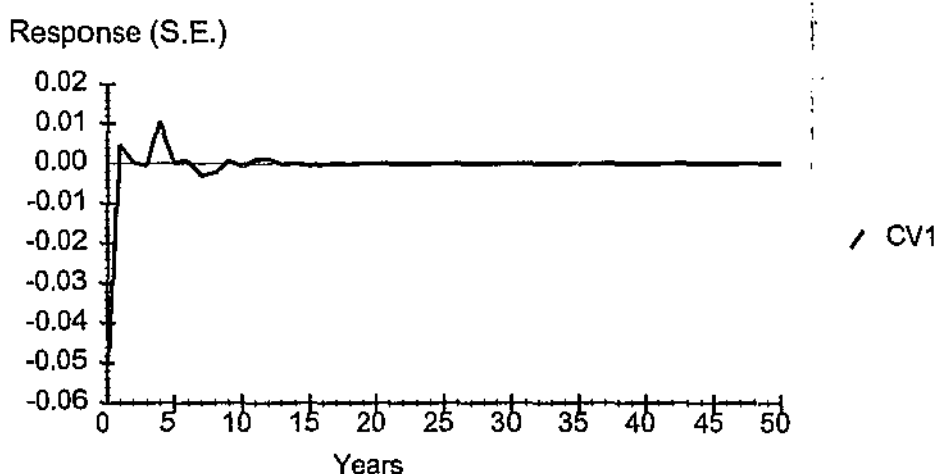
Response (S.E.)

Figure 26   GIR to one S.E. shock in the equation for CIC

227
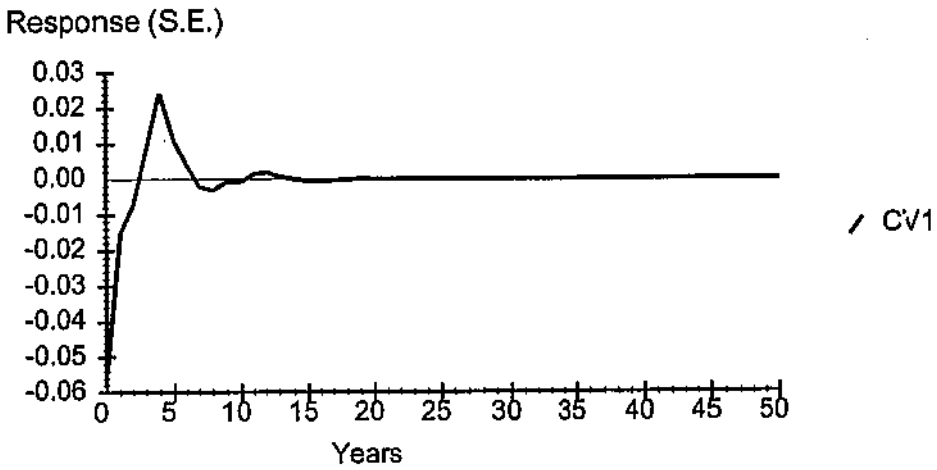
Figure 27   GIR to one S.E. shock in the equation for G

From the GIR in Figure 28, the initial response to a shock on international trade is negative, but is quickly rectified in the two to four years horizon. A positive adjustment is realised between the fifth and the seventh year. It seems that some cyclical fluctuations appear again in the year 8 to 15 horizon before the effect of the shock disappears altogether.
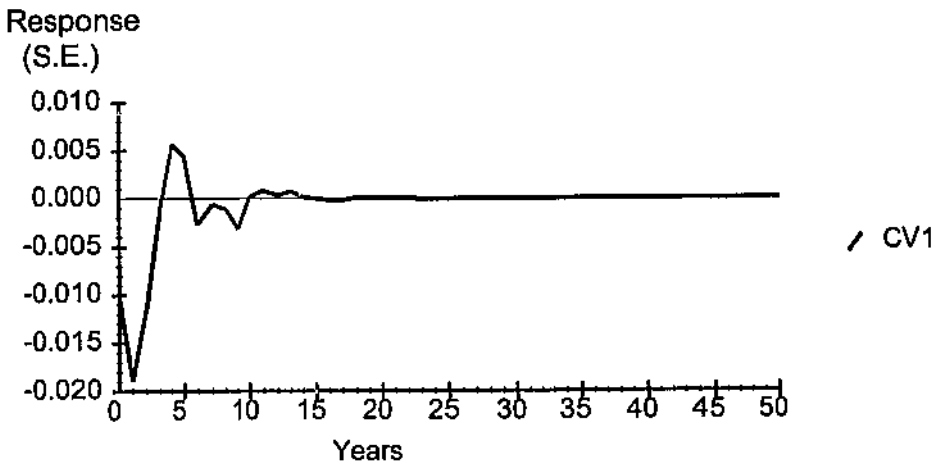

**Figure 28   GIR to one S.E. shock in the equation for CAB**
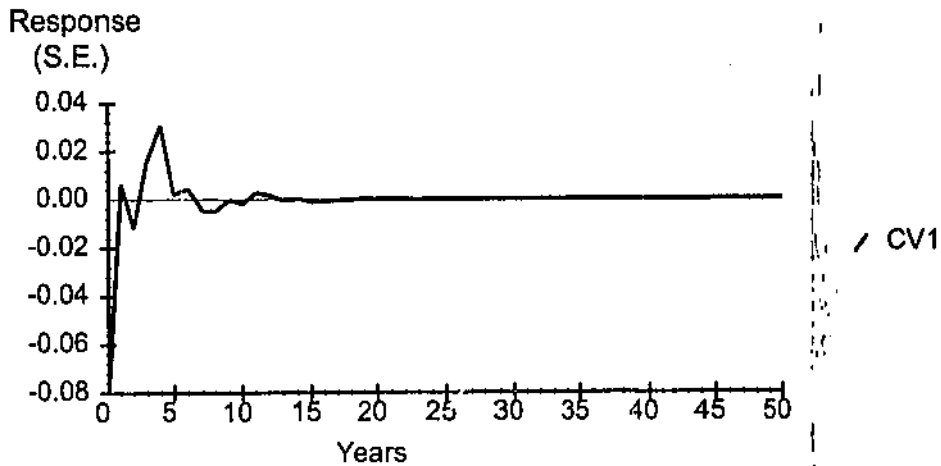
Figure 29   GIR to one S.E. shock in the equation for DMB

Figure 29 suggests that the GIR for the financial intermediation indicator, DMB, generally results in increased macroeconomic activity up to year six. A small second year negative fluctuation is, however, experienced. The effect of the shock on the cointegrating vector disappears between year 12 and 25. In terms of magnitude, the adjustments after the six-year horizon are relatively minor. Overall, the GIR supports the view that financial sector development has a positive impact on macroeconomic activity. As in all impulse response analyses, the conclusions reached here must be interpreted with caution. Hoffman and Rasche (1997, p60) correctly point out that the patterns and length of adjustment time are completely sensitive to the data used in the VAR model.

I have so far considered the effects of system-wide and variable-specific shocks on the cointegrating vector. Figures 30 to 34 present the dynamic effects of a simulated shock on a given variable on all the individual variables in constituting the cointegrating VAR relationship. In some cases, the generalised impulse response functions (GIRF) fluctuate considerably at short horizons.

S.E.
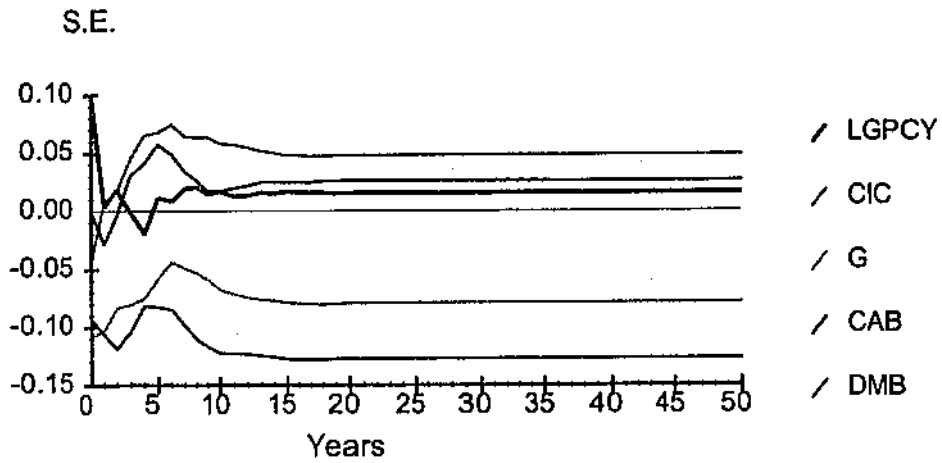
Figure 30   GIRs to one S.E. shock in the equation for LGPCY
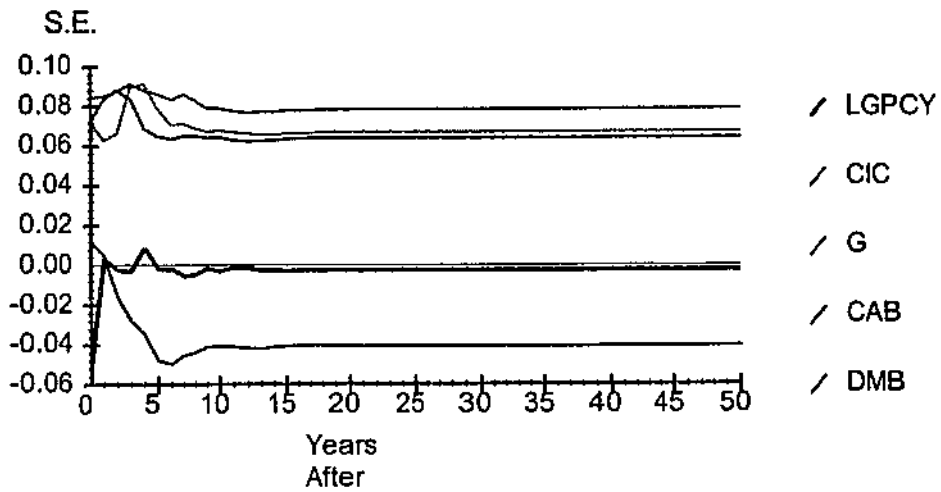
Figure 31   GIRs to one S.E. shock in the equation for CIC

The generalised impulse responses (GIRs) of the macroeconomic variable, LGPCY, are given in Figure 30.   A unit shock on LGPCY has a permanent positive impact on the variables LGPCY, CAB, and CIC – the monetary base.

230
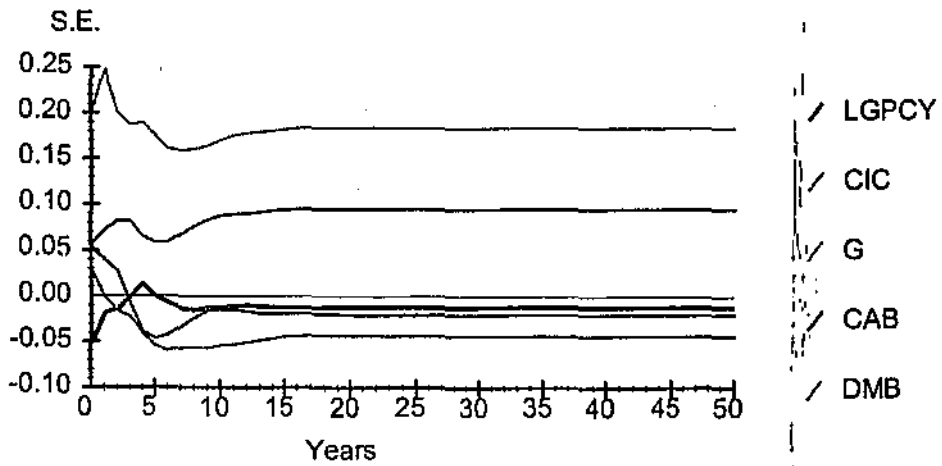
Figure 32   GIRs to one S.E. shock in the equation for G
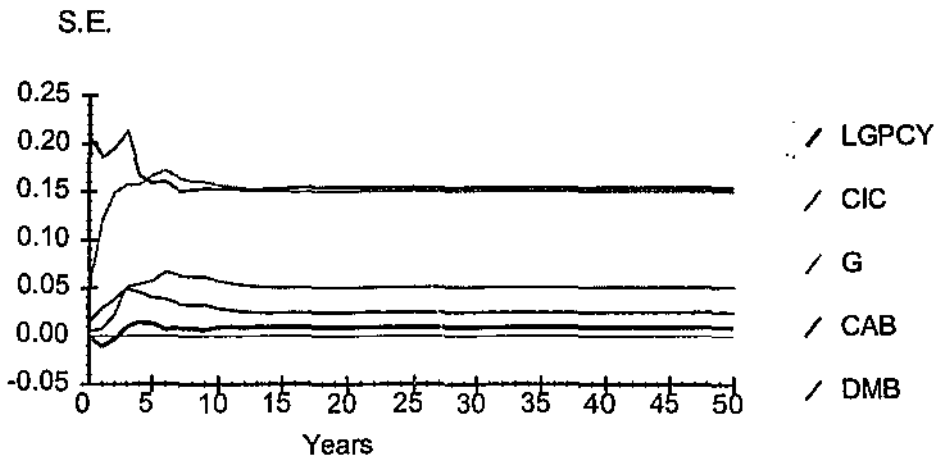
Figure 33   GIRs to one S.E. shock in the equation for CAB
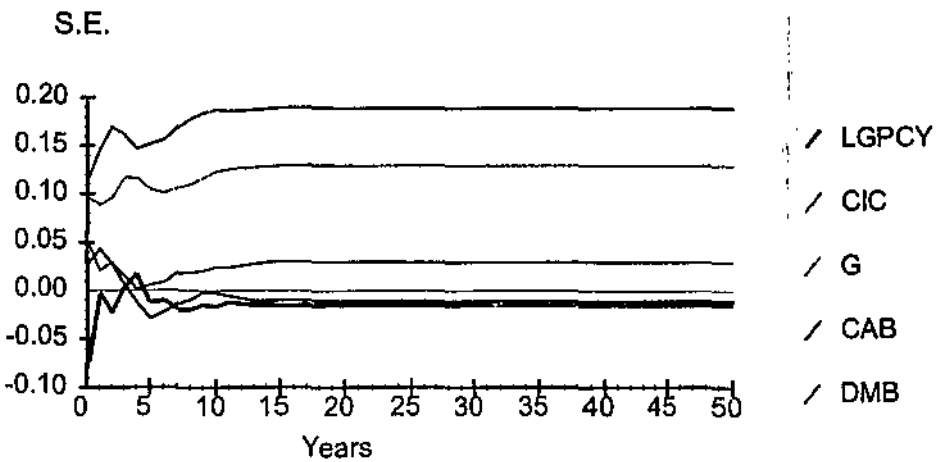
Figure 34   GIRs to one S.E. shock in the equation for DMB

231

Negative adjustments are noted on government size (G) and the financial intermediation sector (DMB). Positive effects take between 10 to 15 years to reach the "stead state" values. Negative fluctuations require longer periods to adjust to their steady state values. The negative reaction of the financial sector to a shock in macroeconomic activity is not consistent with theory, because a thriving economy should logically foster financial sector development. In practice, the persistence of profitability in the Zimbabwean financial sector at times when economic fundamentals is yet another empirical puzzle.

In Figure 31, the monetary base positively affects government size (G), the financial sector (DMB) and own variable (CIC). There is a strong negative reaction on the current account balance (CAB), which reaches its deepest point in year six. There is a strong adjustment to economic activity in year 1, but the shock is transitory. The pattern in Figure 31 suggests that LGPCY is the only variable whose effect eventually diminishes to zero.

A different pattern emerges in Figure 32 where a unit shock on G yields negative, but close to zero, steady state values on LGPCY and CAB. A large negative effect is projected on the monetary base. The responses of DMB and the fiscal sector itself suggest large permanent positive effects. Turning to Figure 33, a unit shock to the international trade sector generates a positive effect on all variables in the model. The shock generates relatively higher steady state values in own variable (CAB) and the fiscal sector (G), while LGPCY and DMB complete their adjustments with values that are close to zero.

Next, Figure 34 examines the dynamic effects of a simulated shock on the financial sector upon all other variables. The graph establishes that financial aggregates positively affect the fiscal sector (G) and own variable (DMB). The response pattern suggests that the effect on the monetary base reaches zero in year four, before settling for a positive steady state value in the 10 and 15 years time horizon. The initial effect on the current account balance (CAB) in year 1 (one) is positive, but jumps to a negative value in year 3. It reaches its deepest point in year 5. Turning to LGPCY, an indicator of macroeconomic activity, points to a response that fluctuates over time. Initially a shock in the financial sector produces a positive effect on economic activity up to year 4. Thereafter the adjustment is slightly negative, but settles for a steady state value close to

zero. This pattern suggests that a series of innovations in the financial sector might be necessary to sustain long run positive responses in LGPCY. In theory, variable specific shocks are, however, ambiguous and may persist forever, Pesaran and Pesaran (1997, p444 - 5). In Figure 34, only LGPCY and CAB have steady state values close to zero, while the rest positive steady state adjustments. Ideally standard error bounds (plus and minus one standard deviation) could be computed and displayed around the point estimates to determine the statistical significance of whether the response functions are bounded away from zero. There is no guidance in Microfit to this effect although Garratt et al (1999, p18 n25) suggest otherwise.

Short run dynamics can also be analysed through the forecast error variance decomposition (VDC) analysis and the vector error correction model (VECM) specification. Impulse responses and VECM analysis are regarded as within-sample causality tests. Variance decomposition analyses are out-of-sample causality tests, which quantify the forecast error variance of each variable into components that can be attributed to innovations in each variable in the system including its own. In other words, VDC breaks down the variance of the forecast error for each variable into proportions that are accounted for by previous changes in each variable in the system. Generalised VDC, unlike orthogonalized variance decomposition, is philosophically attractive as it is not sensitive to the ordering of the variables. A deficiency of generalised VDC, however, is that there are no perfect percentage decompositions because the relative weights of the forecast error variance do not add up to 100%, contrary to the case with orthogonalized VDC.

Table 19 below summarises the decomposition information attributed to each of the lagged variables over six different time horizons, viz Years 1, 5, 10, 20, 30 and 50. The principal diagonal values in each horizon estimate the degree of exogeneity for each variable. In fact, the diagonal measures the extent to which a variable's own variance is determined by innovations in its own variable over the forecast horizon. A completely independent variable is exclusively forecast from its own lagged values. It follows that its forecast error variance is entirely explained by its own disturbances. In other cases, the contribution of other variables (extent of endogeneity) is explained by the off diagonal values.

Table 19

Generalised Forecast Error Variance Decomposition Analyses

Horizon		Percentage of Forecast Variance Explained by Innovations in:				
		LGPCY	CIC	G	CAB	DMB
	Relative Variance in:					
1 Year	LGPCY	94.61	25.83	32.64	1.25	64.00
	CIC	10.99	79.45	5.32	0.42	18.29
	G	21.48	8.73	95.36	16.35	16.34
	CAB	1.02	0.20	5.68	97.42	3.17
	DMB	57.16	34.70	23.44	2.99	97.61
	LGPCY	86.18	22.34	30.47	4.72	61.67
5 Years	CIC	11.19	39.08	5.49	7.97	3.80
	G	14.63	11.63	77.93	37.53	20.90
	CAB	2.75	1.98	3.73	89.03	1.81
	DMB	38.19	23.33	19.15	5.60	86.93
	LGPCY	80.24	18.91	30.27	5.92	59.72
10 Years	CIC	12.10	28.16	8.09	10.10	2.20
	G	10.90	10.72	67.12	44.67	22.78
	CAB	2.90	3.75	3.30	84.87	1.31
	DMB	33.42	16.21	16.53	4.05	82.21
	LGPCY	71.10	14.39	29.44	8.81	55.14
20 Years	CIC	10.80	25.61	8.07	10.01	2.63
	G	11.32	9.63	65.30	44.30	27.12
	CAB	2.53	4.64	2.42	83.54	0.90
	DMB	34.88	12.18	18.29	2.54	80.88
	LGPCY	65.80	11.67	29.11	10.36	52.60
30 Years	CIC	10.20	25.02	7.86	10.00	2.66
	G	11.56	9.28	64.96	44.00	28.64
	CAB	2.45	4.96	2.13	82.92	0.76
	DMB	35.40	11.10	18.94	2.12	80.58
	LGPCY	59.84	8.64	28.73	12.10	49.75
50 Years	CIC	9.70	24.52	7.68	10.00	3.05
	G	11.75	8.99	64.68	43.77	29.89
	CAB	2.38	5.24	1.88	82.39	0.63
	DMB	35.78	10.29	19.43	1.81	80.35

Notes: The results are based on a cointegration model with restricted intercepts and no trends in the VAR. 71 observations from 1928 to 1998. Order of VAR = 4, chosen r =1. The following restrictions were imposed on the underlying model a1=1, a3 = 0.

In Table 19, percentages in columns 3 to 7 depict the explanatory power of the respective variables over the variables given by the rows in a particular time horizon. In simple terms, columns explain influence on rows. Focusing on the first year time horizon suggests that the financial intermediation indicator, DMB, is the leading variable in the VAR model. About 97.61% of the variable's own forecast error variance is attributable to shocks in own lagged values over the forecast horizon. The exogeneity of financial intermediaries persists across time with an own minimum influence of 80.35% in the 50 years time horizon. Financial intermediaries and the foreign trade sector (CAB) closely compete for dominance across all time phases. Vagaries of the international trade sector, CAB, are, however, the leading (most exogenous) long term variable. In the intermediate term, macroeconomic activity (LGPCY) relaces the fiscal sector (G) as the third most influential variable. The monetary base (CIC) is the least exogenous variable in the model. Only 39.08% of own variance is attributable to movements in CIC come year 5. This percentage falls to a mere 24.52% in the 50 years time horizon.

Turning to endogeneity, with regard to the finance-growth nexus, Table 15 suggests that financial intermediaries (DMB) account for 64 % of macroeconomic activity (LGPCY) variance in the horizon year 1. In turn LGPCY explains 57.16% of the variance in financial intermediaries in the same time band. Across all horizons, the financial intermediaries account for a larger proportion of macroeconomic activity than the reverse relationship. The disparity is more pronounced across higher time horizons. In the thirty-year time horizon, for instance, financial intermediation explains 52.60% of LGPCY whereas the reverse influence is only 35.40%. When contrasted with other variables in the model other than LGPCY itself, financial intermediaries consistently outperform the rest in accounting for the forecast error of macroeconomic activity. Shocks to the current account balance (CAB) only have a significant long-term contribution to the fiscal sector (G) forecast error variance, and just that. The contribution of the monetary sector, CIC, appears insignificant across time. This said; the monetary sector accounts for more variability in the financial sector than does the financial intermediaries on the monetary sector. Fluctuations in the monetary sector could be important to the extent they affect financial development. Positive real interest rates, for instance, can benefit the financial sector.

VDC analyses confirm the empirical findings from VAR and GIRs that financial intermediation facilitates economic growth. These results are consistent with the main proposition in this study that financial sophistication has a positive impact on economic activity or growth. Generalised VDC results suggest that, in relative terms, causality runs from financial intermediation to economic development rather than the other way round. Needless to say the findings are naturally sensitive to quality of data and specification of the VAR model.

The vector error correction model (VECM) is another form in which to characterise the direction of causality in a cointegrating VAR model. There are as many lagged error correction terms (ECT), as there are endogenous variables in the underlying VAR model. Tables 20 and 21 below provide computational details of the estimated error correction equations associated with the macroeconomic (LGPCY) and the financial intermediation (DMB) variables respectively. The same procedure was followed to obtain results for all other variables. In all cases, several differenced variables were temporarily added to the OLS equation by Microfit in order to help map out the adjustment process. Tables 20 and 21, for instance, list some of the temporary variables added.

The Microfit programme automatically generates diagnostic tests to assist in the evaluation of serial correlation; the functional form; normality; and heteroscedasticity. The various diagnostic statistics, based on Chi-square and F-test statistics, are given at the bottom of Tables 20 and 21. Apart from non-normal errors in some variables, the various diagnostic test statistics suggests that there is no evidence of statistical problems in the underlying variables.

As illustrated in Tables 20 and 21, very few coefficients on the differenced variables were found to be statistically significant. [Contrary to the general trend, the ECT for the monetary sector (CIC) equation, however, contained several statistically significant coefficients on the differenced variables.] Statistically insignificant coefficients on the lagged temporary variables do not affect the validity of the underlying cointegrating VAR model because the ECM characterise short run dynamics. In contrast, cointegration and theory are concerned with long run relationships. Intuitively, coefficients and signs of the error correction terms give the single lag magnitude and direction of short run dynamics essential to correct for deviations from the long run equilibrium relationship.

Table 20

ECM for variable LGPCY estimated by OLS based on cointegrating VAR(4)

```
            ECM for variable LGPCY estimated by OLS based on cointegrating VAR(4)
*****************************************************************************************
Dependent variable is dLGPCY
71 observations used for estimation from 1928 to 1998
*****************************************************************************************
Regressor              Coefficient          Standard Error         T-Ratio[Prob]
dLGPCY1                   .28496                 .30496              .93443[.354]
dCIC1                    .035233                 .16299              .21617[.830]
dG1                      -.12588                 .079594            -1.5816[.119]
dCAB1                    -.095523                .064805            -1.4740[.146]
dDMB1                    .095975                 .19967              .48066[.633]
dLGPCY2                   .14435                 .23702              .60901[.545]
dCIC2                    .092987                 .18765              .49554[.622]
dG2                     -.0022209                .075035            -.029598[.976]
dCAB2                    -.028414                .066993             -.42413[.673]
dDMB2                    -.24239                 .23068             -1.0508[.298]
dLGPCY3                   .18095                 .13692              1.3215[.192]
dCIC3                    -.28808                 .14549             -1.9801[.053]
dG3                      -.041518                .075824             -.54756[.586]
dCAB3                    -.0049351               .064323             -.076723[.939]
dDMB3                    .41602                  .16767              2.4812[.016]
ecm1(-1)                 -1.3600                 .32187             -4.2254[.000]  [ECT 1]
*****************************************************************************************
List of additional temporary variables created:
dLGPCY = LGPCY-LGPCY(-1)
dLGPCY1 = LGPCY(-1)-LGPCY(-2)
dCIC1 = CIC(-1)-CIC(-2)
dG1 = G(-1)-G(-2)
dCAB1 = CAB(-1)-CAB(-2)
dDMB1 = DMB(-1)-DMB(-2)
dLGPCY2 = LGPCY(-2)-LGPCY(-3)
dCIC2 = CIC(-2)-CIC(-3)
dG2 = G(-2)-G(-3)
dCAB2 = CAB(-2)-CAB(-3)
dDMB2 = DMB(-2)-DMB(-3)
dLGPCY3 = LGPCY(-3)-LGPCY(-4)
dCIC3 = CIC(-3)-CIC(-4)
dG3 = G(-3)-G(-4)
dCAB3 = CAB(-3)-CAB(-4)
dDMB3 = DMB(-3)-DMB(-4)
ecm1 =    1.0000*LGPCY  -.064069*CIC    -.0000*G  -.051971*CAB +  .085555*DMB
    -.14407
*****************************************************************************************
R-Squared                       .58808    R-Bar-Squared                     .47574
S.E. of Regression              .093300   F-stat.    F( 15,   55)    5.2348[.000]
Mean of Dependent Variable   -.0026461    S.D. of Dependent Variable        .12886
Residual Sum of Squares         .47877    Equation Log-likelihood         76.7277
Akaike Info. Criterion         60.7277    Schwarz Bayesian Criterion      42.6263
DW-statistic                    1.9064    System Log-likelihood          358.3104
*****************************************************************************************


                              Diagnostic Tests
*****************************************************************************************
*    Test Statistics  *      LM Version         *        F Version
*****************************************************************************************
*                     *                          *
* A:Serial Correlation*CHSQ(  1)=   .50738[.476]*F(   1,   54)=    .38867[.536]
*                     *                          *
* B:Functional Form   *CHSQ(  1)=  1.2180[.270]*F(   1,   54)=    .94256[.336]
*                     *                          *
* C:Normality         *CHSQ(  2)=  4.9094[.086]*        Not applicable
*                     *                          *
* D:Heteroscedasticity*CHSQ(  1)=   .10203[.749]*F(   1,   69)=    .099296[.754]
*****************************************************************************************
    A:Lagrange multiplier test of residual serial correlation
    B:Ramsey's RESET test using the square of the fitted values
    C:Based on a test of skewness and kurtosis of residuals
    D:Based on the regression of squared residuals on squared fitted values
```

237

Table 21

ECM for variable DMB estimated by OLS based on cointegrating VAR(4)

```
        ECM for variable DMB estimated by OLS based on cointegrating VAR(4)
*********************************************************************************
Dependent variable is dDMB
71 observations used for estimation from 1928 to 1998
*********************************************************************************
Regressor              Coefficient         Standard Error         T-Ratio[Prob]
dLGPCY1                   -.51153                .35485           -1.4415[.155]
dCIC1                    -.14572                .18965            -.76835[.446]
dG1                       .051563               .092616           .55674[.580]
dCAB1                     .063708               .075408           .84485[.402]
dDMB1                     .58944                .23234           2.5370[.014]
dLGPCY2                  -.43109                .27580           -1.5630[.124]
dCIC2                     .045100               .21835            .20655[.837]
dG2                       .019763               .087312           .22635[.822]
dCAB2                     .055483               .077954           .71174[.460]
dDMB2                    -.076047               .26842            -.28331[.778]
dLGPCY3                  -.21253                .15932           -1.3340[.188]
dCIC3                     .083942               .16929            .49584[.622]
dG3                       .041035               .088229           .46510[.644]
dCAB3                     .079694               .074848          1.0647[.292]
dDMB3                    -.081589               .19510            -.41818[.677]
ecm1(-1)                  .98791                .37453           2.6377[.011]  [ECT 5]
*********************************************************************************
List of additional temporary variables created:
dDMB = DMB-DMB(-1)
dLGPCY1 = LGPCY(-1)-LGPCY(-2)
dCIC1 = CIC(-1)-CIC(-2)
dG1 = G(-1)-G(-2)
dCAB1 = CAB(-1)-CAB(-2)
dDMB1 = DMB(-1)-DMB(-2)
dLGPCY2 = LGPCY(-2)-LGPCY(-3)
dCIC2 = CIC(-2)-CIC(-3)
dG2 = G(-2)-G(-3)
dCAB2 = CAB(-2)-CAB(-3)
dDMB2 = DMB(-2)-DMB(-3)
dLGPCY3 = LGPCY(-3)-LGPCY(-4)
dCIC3 = CIC(-3)-CIC(-4)
dG3 = G(-3)-G(-4)
dCAB3 = CAB(-3)-CAB(-4)
dDMB3 = DMB(-3)-DMB(-4)
ecm1 =     1.0000*LGPCY  -.064069*CIC    -.0000*G  -.051971*CAB +  .085555*DMB
           -.14407
*********************************************************************************
R-Squared                      .25811     R-Bar-Squared                  .055774
S.E. of Regression             .10856     F-stat.    F( 15,  55)    1.2757[.249]
Mean of Dependent Variable     .014879    S.D. of Dependent Variable     .11173
Residual Sum of Squares        .64825     Equation Log-likelihood        65.9690
Akaike Info. Criterion         49.9690    Schwarz Bayesian Criterion     31.8676
DW-statistic                   2.0350     System Log-likelihood          358.3104
*********************************************************************************


                              Diagnostic Tests
*********************************************************************************
*    Test Statistics   *      LM Version       *         F Version
*********************************************************************************
*                      *                       *
* A:Serial Correlation*CHSQ(  1)=   .52024[.471]*F(  1,  54)=  .39859[.530]
*                      *                       *
* B:Functional Form    *CHSQ(  1)=  1.0727[.300]*F(  1,  54)=  .82837[.367]
*                      *                       *
* C:Normality          *CHSQ(  2)= 25.8121[.000]*      Not applicable
*                      *                       *
* D:Heteroscedasticity*CHSQ(  1)=   .088294[.766]*F(  1,  69)=  .085914[.770]
*********************************************************************************
    A:Lagrange multiplier test of residual serial correlation
    B:Ramsey's RESET test using the square of the fitted values
    C:Based on a test of skewness and kurtosis of residuals
    D:Based on the regression of squared residuals on squared fitted values
```

The Error Correction Term (ECT) links the realised value to the target value of a variable. Statistical significance of the coefficient on the error correction term, therefore, might affect the model's long run properties. In simple terms, variables with statistically insignificant coefficients on the error correction terms, as determined by the t-ratios, can be regarded as exogenous or leading variables. Before proceeding, it will suffice to note that the VECM has two components relating to the standard VAR in first difference and the single lag ECT. [See Section 7.4.] The subsequent discussion is confined to the ECT, which can be used to establish the quantitative importance of the short run dynamics. Long run relationships have already been dealt with via VAR systems in levels.

Table 22

Summary results of error correction relations in the VAR model

Dependent variable	Error correction term (ECT)	Coefficient	Standard Error	T- Ratio [Prob.]
$\Delta LGPCY$	ECT 1	-1.3600	0.32187	-4.2254 [0.000]
ΔCIC	ECT 2	1.1784	0.27689	4.2560 [0.000]
ΔG	ECT 3	0.81246	0.64650	1.2567 [0.214]
ΔCAB	ECT 4	0.47816	0.67964	0.70354 [0.485]
ΔDMB	ECT 5	0.98791	0.37453	2.6377 [0.011]

Notes: ECM = LGPCY - 0.064069 CIC - 0.0000 G - 0.051971 CAB + 0.085555 DMB - 0.14407

71 observations used for estimation from 1920 to 1998. The residuals were tested for stationarity by way of unit root tests and found to be satisfactory.

Table 22 provides a summary of the ECT coefficients and standards errors for all variables in the model. These results establish that the error correction term is significant in the macroeconomic activity; monetary sector; and financial intermediation equations but not in the fiscal sector, and foreign trade equations. Technically, this suggests that the fiscal sector and the international trade sector are exogenous variables. [Influence of the fiscal sector was rendered insignificant by design.] In terms of magnitudes, vicissitudes of the international trade sector, CAB, are, once again, confirmed as the leading (most exogenous) long-term variable, as was the case in VDC. The coefficient on the ECT in the foreign trade sector equation points to the least response in the CAB to variations in the long run relationship suggested by cointegration model.

239

In relative terms, it seems that indicators of macroeconomic activity (LGPCY) and the monetary sector (CIC) are the most endogenous variables in the model. There is evidence of rapid and highly statistically significant responses to deviations from the long-run relationship in the monetary sector and in macroeconomic activity. The negative and very significant coefficient on the ECT in the LGPCY equation suggests that negative fluctuations from the long-run relationship are adjusted by an increase in macroeconomic activity. Conversely, negative deviations in the long run relationship would necessitate a negative adjustment in the monetary base to restore equilibrium.

Turning to the indicator of financial intermediation, DMB, the coefficient on the ECT is statistically significant. This phenomenon suggests that financial intermediaries respond to deviations in the long run relationship implied by the model. The statistically significant response renders financial intermediation an endogenous variable. Furthermore, the positive sign on the ECT in financial intermediation equation supports the view that economic development or real activity promotes financial development. Nevertheless, it has already been noted that the coefficient on the ECT in the real activity equation is highly statistically significant. This makes economic development an endogenous process capable of positive response to innovations in other variables such as financial intermediation. It follows that, it can safely be concluded that the possibility of reciprocal causality between financial intermediation and economic development cannot be ruled out. This as the case may be, does not put economic development and financial sophistication on equal footing. In comparative terms, the coefficient on the ECT in the real activity equation is 38% more responsive 60% more statistically significant than that on financial intermediation. Thus, the VECM results might imply that in relative terms net causality flows from financial intermediation to real activity. Logically it follows that policies and measures that enhance sophistication of the financial system would have a positive impact on real activity in Zimbabwe. Conversely, poor performance by financial intermediaries would retard real activity to a greater extent than economic decline would hamper the financial sector. Thus financial repression can be very costly for society.

9 CONCLUDING REMARKS

Nature will not betray those who approach her with an open heart

Wordsworth

This research examines the theoretical links between financial intermediation and economic performance. Empirical evidence on long-run relationships and short-run dynamics is based on an array of multivariate time series analyses, using a newly constructed data set from Zimbabwe. More specifically, Vector Autoregression (VAR), Generalised Impulse Response Analysis (GIR); Forecast Error Variance Decomposition (VDC); and the Vector Error Correction Model (VECM) were employed.

A number of factors motivated the adoption of a rich multivariate time series approach. In the first place, there is growing concern that bi-variate and tri-variate VARs are misspecified because they do not capture the core economic sectors of the economy. There is high risk that conclusions from such studies are tainted by omitted variables. Secondly, cross-country and panel studies might be too generalised due to averaging, which renders causality difficult to interpret. Luintel and Khan (1999, p384) are obviously right that "aggregation blurs important events and differences across countries." According to them, Levine and Zervos (1996, p325) conceded that there are "measurement, statistical and conceptual problems" in cross-country studies (Ibid). Focus on one country, for instance, avoids problematic currency conversion. Thirdly, most studies in leading journals tend to concentrate at advanced economies with similar development patterns. In my view, emerging and transition economies stand to reap great benefits from financial sophistication because demand currently outstrips supply of services. Finally, Beck, Demirgüç-Kunt, and Levine (1999), constructed a new financial database which provide an array of complementary indicators through which finance might influence real activity.

The econometric methodology applied in this study is described in great detail, in an effort to demystify time series analysis. An equally rigorous approach was followed to determine the nature of links between financial aggre-

241

gates and economic activity both in the long run and short run. Evidence from the cointegrated VAR system supports the view that financial aggregates have a causal effect of economic activity in the long run. From a theoretical point of view, financial sophistication can improve real activity by increasing investment via deposit mobilisation, or through increased factor productivity emanating from competent project screening, monitoring and enforcement of sound corporate governance practices. Financial aggregates pertaining to size were found to be very informative; and had a positive impact on economic activity. Similarly liquid liabilities were found to have a causal effect on real activity. These findings support the growing recognition, since Schumpeter (1911), that financial sophistication positively affects real activity. Irving Fisher (1933),[25], Mishkin (1978), McKinnon (1973), Shaw (1973) and Levine (1997), for example, reached similar conclusions. Credit aggregates such as private sector credit (PSC) were, however, not informative about economic development in Zimbabwe. Most of them were excluded from the model due to unsatisfactory unit root properties. On one hand this could imply that there is no clear-cut relationship between credit aggregates and economic activity in Zimbabwe. On the other, the result merely reflects on poor quality of available data.

In simulated short-run dynamics, the model with demand deposit banks (DMB) as a measure of financial intermediation converged faster than the alternative models incorporating liquid liabilities (LQL) and the entire banking sector (BKA). Evidence from forecast error variance decomposition analyses (VDC) suggests that financial intermediation (DMB) is the leading variable in the short horizon. In the long term, the foreign trade sector, represented by the current account balance (CAB) takes over as the leading variable. Financial intermediaries remain the second most important exogenous variable. The monetary base (CIC) turns out to be an endogenous variable. There is evidence of reciprocal causality between financial intermediation and economic activity. In relative terms, the impact of financial intermediation on macroeconomic activity is greater than the reverse relationship. In the VECM framework, the results are very similar to those obtained via variance decompositions.

Due to data limitations, analysis of capital markets is largely based on graphical and descriptive techniques. In terms of costs and margins, the Zimbabwe financial system is not very efficient due to structural constraints espe-

242

cially on real interest rates. The persistence of bank profitability in Zimbabwe during times of adverse macroeconomic developments can, among other things, be attributed to huge interest margins. Tobin (1963) demonstrated that the success of banks does not depend on their size but margins.

Financial theory, e.g. agency risk and information asymmetry, has taught us economic activity does not take place in a vacuum or in perfect markets. This study provides case evidence that political institutions and the state of corporate governance in Zimbabwe affect the pattern and prospects for both economic and financial development. LaPorta, Lopez–de-Silanes, Shleifer and Vishny (1997, 2000) provide ample evidence to the effect that a country's legal tradition, for instance, determines financial development through the rule of law, contract enforcement, and property rights. Beck, Demirgüç-Kunt and Levine (2001) focus on political structures as influential determinants of the degree of financial sophistication. The basic idea is that a group in power designs policies and institutions that guarantee self-entrenchment and self-enrichment. If the elite stand to benefit from free trade, they will enact laws and create institutions supportive of competitive markets. In contrast, centralised political systems intolerant to competition, transparency, and accountability are bound to retard rather than encourage financial development. Once entrenched, authoritarian institutions are very difficult to eradicate. For instance, post independence rulers of what once were badly run colonies usually exploit the established institutions to their own advantage and profit. The POIVAD concept proposed in this thesis would help inform debate on persistent economic oppression in Zimbabwe.

One Ralph Waldo Emerson, cited in Maital (1994, p3) reportedly saluted his friends with the question: What have you learnt since we last met? A number of constructive recommendations have been put forward throughout this study. It is hoped this thesis will prompt a broad and open discussion of issues raised. Innovative practices and constructive research might guide Zimbabwe to adopt economic and financial policies with a high probability of promoting sustainable economic growth. Institutional areas of policy emphasis for Zimbabwe should include transparency, accountability, and good corporate governance. Unless prevailing wisdom can stand up to criticism, its aesthetic value may never be fully appreciated. I agree unreservedly with Davies (1991, p205) that, "Science progresses by betraying ancient principles for new insights."

10 SUGGESTIONS FOR FURTHER RESEARCH

Traditions are needed, and will persist, because they give continuity and form to life... Without intellectual traditions, ideas would have no focus or direction. // However, it is part of academic life continually to explore the limits of such traditions, and foster active interchange between them.

Professor Anthony Giddens (1999), "Tradition," BBC Reith Lectures

There has been inadequate attention to financial reform in Zimbabwe. Rigorous analysis is required to determine whether continued financial repression in Zimbabwe has brought more harm than benefits. Notwithstanding widespread agreement in financial literature regarding the causal effect of financial intermediation on economic growth, the financial sector formed a little part of government economic policy before and after independence. Government might have misunderstood the cardinal role of financial intermediation in economic development. In my view, authorities should leave no stone unturned to encourage financial innovation. Merton (1990, p270) regards financial innovation as "the engine driving the financial system on its prospective journey to economic efficiency." Even small benefits to individuals aggregate into enormous social gains for the economy as a whole. In the same vein the hours lost by Zimbabweans queuing for simple financial services aggregate into enormous loss of productivity at a national level. Van Horne (1985) agrees that true financial innovation makes the markets either more efficient or more complete by lowering intermediation costs or inconvenience costs, (p622). Recent advances in financial intermediation literature also suggest that a functional approach to financial architecture brings more economic benefits than the structural approach Zimbabwe has traditionally followed.

Zimbabwe has also run chronic fiscal deficits from one generation to another. Economic theory suggests that fiscal deficits result in a short-term deterioration of the current account. A surplus is envisaged in the long term if deficit expenditure is utilized on investment. Apart from foreign borrowing, a deficit is either financed through money creation or domestic borrowing. Desperate reliance on money creation may be highly inflationary. Since UDI the government

has occasionally relied on borrowing from the domestic banking sector. Most economists argue that the practice results in crowding out of private sector investment. Economic growth decreases while the current account deficit rises due to low exports. Successive devaluations have failed to galvanize export performance. Inelastic import and export demand imply that the Marshall-Lerner Condition is never met, resulting in disastrous price increases following any devaluation. From 1999 to 2001, economic activity in Zimbabwe was, among other things paralysed by rampant inflation, foreign currency shortages, international isolation and financial disintermediation. Excessive liquidity in the financial sector confirms that banking institutions have abandoned their core business in favour of money market operations. The resultant economic decadence was crowned with the reintroduction of a fixed exchange rate regime and price controls. As a matter of policy Zimbabwe need clarity of purpose as to whether she is pursuing exchange rate or inflation targets. Moves by the RBZ to introduce higher denominations of banknotes such as the Z$200 and Z$500 notes will not solve this predicament. What may be required is to restructure the economy and introduce a new currency. However this question does not concern our immediate needs but it could make an interesting subject of a separate study.

Simulated short run dynamics conducted in this study provide strong evidence that vicissitudes of the international trade sector is not responsive to innovations in other variables. A logical extension of this research would be to examine more sharply the determinants of this sector. One possibility is to explore developments on the current account balance (CAB) via the Marshall-Lerner condition. This issue is import important given the constant debate regarding an appropriate exchange regime for the Zimbabwe dollar. In addition, VAR analysis revealed that current account deficits are have a negative long run impact on macroeconomic activity.

Corporate governance and consumer protection in the Zimbabwe Financial System are other potential candidates for further research. Due to political unrest in Zimbabwe corporate governance analysis in this research is largely conceptual. Ideally, future researchers should gather detailed information from market participants on qualitative issues such as governance, legal issues, agency problems and dynamic efficiency of the Zimbabwe Financial System. A questionnaire moulded along Hellman et al (2000) targeting employees in

banking, students of finance, and other market participants might be used. It would be interesting to know what mechanisms could be put in place to enhance consumer protection in Zimbabwe and how these can be enforced, given the numerous complaints of overcharging, poor service or outright exploitation.

There is an urgent need for a project dedicated to the construction of an electronic time series database in Zimbabwe. I have in mind a database that covers financial, monetary, and economic aggregates for as long a span as possible. In Zimbabwe it is very difficult, for example, to obtain reliable bank level data going back to say 1995. The sensitive nature of financial information sometimes plays in the hands of political calculations. From December 1965 the RBZ was banned from publishing statements of its assets and liabilities, annual accounts and reports. The first official Quarterly Economic and Statistical Review (QESR) for the period appeared in September 1980. Unfortunately, the publication only traced the major economic and statistical trends back to 1975. "Stock Exchange Prices and Yields" first appeared in the RBZ QESR around March/June 1998. Although the series dates back to 1975, it has no figure for market capitalisation, for example. By the December 1999, when the QESR series was discontinued in favour of monthly and weekly publications, successive Governors of the Reserve Bank of Zimbabwe had not kept the Dr D. C. Krogh's (1980, p5)[26] promise to extend the Reserve Bank's record of the country's financial data series back 1965. I am not sure whether anything can be salvaged from the Quarterly Bulletins of Financial statistics oft cited in Sowelem (1967).

Although the data gathering process is not a significant research output according to academic traditions, its contribution to research output and posterity is immense. A good database is a powerful force to build sustainable interest in vector autoregressions, cointegration analysis and time series modelling.

Statistically, researchers face a significant challenge to develop reliable techniques that can handle higher order integration. As the literature of cointegration progresses, new techniques are emerging that do not require rigorous determination of whether variables are I (1) or I (0). In my view, the challenge to develop procedures that do not depend on fluid distinctions regarding the order of integration and extent of cointegration very is strong.

246

APPENDICES

Appendix 1: Vague Concepts: capital and money

Capital

Arbitrary definitions of concepts such as capital, money, investment and governance render their consideration for purposes of analysis problematic. According to Taylor (2000, p144) Irving Fisher "defines wealth as anything material that is owned. *Capital* is then defined as the stock of wealth at any point in time, while *income* is defined as the flows of services generated from wealth." Bartllet (1987, p59) highlights that the concept of wealth changes with time. "Wealth is that which has value at a given time. Change time and the constituent elements of wealth must change or deteriorate in value." Taylor (2000, p xiii) learnt the hard way that the "search for a single concept of capital in the canon of economics" was problematic because there are several concepts of capital. Frankel (1938, p3.) had earlier on reached the same conclusion, "For capital is an abstract term, the careless use of which is apt to hide the real meaning of the process to which it refers." Use of the word without an adjective can refer to anything from human capital to "physical capital, capital goods, financial capital, working capital, circulating capital, fixed capital, etc, " Taylor (2000, p xiii). In my view human capital is more than "the embodiment of investment in human beings" that Kindleberger and Herrick's (1977, p79) suggest. Thurow (1970) in Jaffee (1990, p38) defines human capital as "productive skills, talents and knowledge." Kindleberger and Herrick's (1977, p79) definition of financial capital as "liquid assets which can easily be exchanged for goods but are not the physical goods themselves " makes it indistinguishable from money. Even some of the greatest writers have struggled to pinpoint a single definition for the concept of capital. Taylor argues

> Vagueness and ambiguity concerning capital appear in the writings of all great capital theorists, whether Smith, Ricardo, Marx, Jevons, Walras, Bohm-Bawerk, Clark, Wicksell, Schumpeter, Fisher, Hayek, Keynes, Hicks, Robinson, Samuelson or Solow.

Joseph Schumpeter's (1911, 1936 p116-27) concept of capital, for instance, is surprisingly indistinguishable from both credit and money, for a man of his remarkable insight. Schumpeter equates capital to "a fund of purchasing power ... consisting of money, ... accumulated liquid resources ... and other assets calculated in money " as distinct from a "stream of income" in the Irving Fisher sense. Illuminated as a fund of purchasing power capital is easily confused with money because it relates to real activity only as a medium of exchange. Schumpeter (p116) insists:

> *Capital is nothing but the lever by which the entrepreneur subjects to his control the concrete goods which he needs, nothing but a means of diverting the factors of production to new uses, or of dictating a new direction to production.*

Although Schumpeter reiterates that means of payment not associated with development does not constitute capital but "exchange media ... for carrying the customary exchanges" he provides little guidance to separate the phenomena. Taylor (2000, pp139-141) argues that Schumpeter had a credit theory of money (means of payment or generalised purchasing power) created by banks through the process of credit creation. I agree with this assessment because Schumpeter's (1936, p117 and 122) concept of capital seems to converge with intermediation.

> The function of capital consists in procuring for the entrepreneur the means with which to produce. It stands as a third agent necessary to production in an exchange economy *between* the entrepreneur and the world of goods. It constitutes a bridge between them. ... Capital, then, is an agent in the exchange economy.

Money

Over the years there have been chronic ambiguities in defining what constitutes as money. Money refers to anything that is generally acceptable as payment for goods and services. Some economists confine money to legal tender, i.e. enforceable at law as means of payment for goods and services or in settlement of debt. Podolski (1986, p184) notes currency theories of money define money narrowly, often in terms of a commodity or quasi-commodity. Financial theories of money (for example by Keynes and Schumpeter) emphasise fiduciary and flexible money aspects. The general financial practice and custom

takes into account currency in circulation and various categories of deposits to arrive at hierarchical definitions of money such as M1, M2... The constituent components of money categories vary over time as deposits at sundry institutions are added, excluded or reclassified. Tobin (1963, p409) marvels at Shaw's cynicism that nobody really knows what the money supply is but whatever constitutes it increases at a regular rate.

Shaw (1973, pp6-7) observes that money, like other financial and non-monetary assets, is characterised by multiple pricing. The four prices of money are unit of account, index of purchasing power (real money), explicit price (interest rate), and ratios of exchange (i.e. four exchange rates – spot, forward, real and nominal)

In Bartlett's (1987, p63) view, "Money, like blood, has two values": circulatory (infusion of life) and plasma. As a medium of exchange and the fulcrum of transactions, money facilitates economic activity. A worthwhile business activity should generate money if the enterprise is to survive. Unless profit has the potential to be translated into money it is illusory. The circulation of money within and among various sectors of the economy is also essential for good economic growth. Money, when equated to plasma, takes a credit function that can be hoarded and canalised into deficient economic units. In real life the financial system consists of more than either monetary or credit aggregates.

Appendix 2: The complex root circle and eigenvalues

(a) The complex unit root circle

If z is a complex number, the solution (or roots) to the equation $\alpha(z) = 0$ may exist as real and complex numbers. Following the representation in Davidson (1999, p85) a complex number z may therefore be expressed as $z = \bar{z} = a - ib$, where a and b are real numbers and i is a complex number. The absolute value or modulus of z is a real number representing "the radial distance of z from the origin in the complex plane, in which a and b are measured on the coordinate axes," Davidson (1999, p85). Its magnitude is given by $|z| = \sqrt{z\bar{z}} = \sqrt{a^2 + b^2}$. When the modulus $|z| > 1$, z is said to be outside the unit circle. (If $|z| = 1$, then it is on, and if $|z| < 1$ it is inside the unity root circle.)

(b) Eigenvectors and eigenvalues

Given a square matrix M, say a matrix of coefficients, an eigenvector or characteristic vector (x) exist if there is a solution λ to the equation $Mx = \lambda x$. Such a value λ for which $x \neq 0$ is termed an eigenvalue. According to Kreyszig (1993, p387) the term is derived from the German word *Eigenwert* in which "eigen" means "proper" and "wert," means "value." The eigen vector (x) exists if x $\neq 0$. To determine the eigenvalues of matrix M it is solved for its characteristic polynomial λ given by $(M - \lambda I)x = 0$, where I is the identity matrix. There are n roots if M is n x n. Those roots are not necessarily distinct. A set of eigenvalues is referred to as the spectrum while the largest absolute value is termed the radius. The characteristic determinant, $\det(\lambda) = \det(M - \lambda I)$, is a necessary and sufficient condition for λ to be a characteristic root of M. If all the roots are non-zero the matrix is non-singular, invertible or stationary.

Appendix 3: Standard Bank Staff Portraits

In 1899 a branch was opened at Gwelo. Above: The Gwelo Branch staff in December, 1898. From left to right: Brauer, Hagelthorn, Gray, McDonagh and Toogood. It was Toogood who, in 1910, was sent to East Africa to examine the prospects for extending the Bank's activities to that area and subsequently opened the first two branches in Mombasa and Nairobi.

(A)

Note: The nameless man lying down in panel (A) probably cannot take the same pose as his "racial superior" work mates

Source: Standard Chartered Bank (1967, p22) "Three Quarters of A Century..."

The Que Que Branch decorated in honour of the visit of the Prince of Wales in 1925. The staff in front, left to right: Tollner, Wright, Evans, Fletcher and Victor.
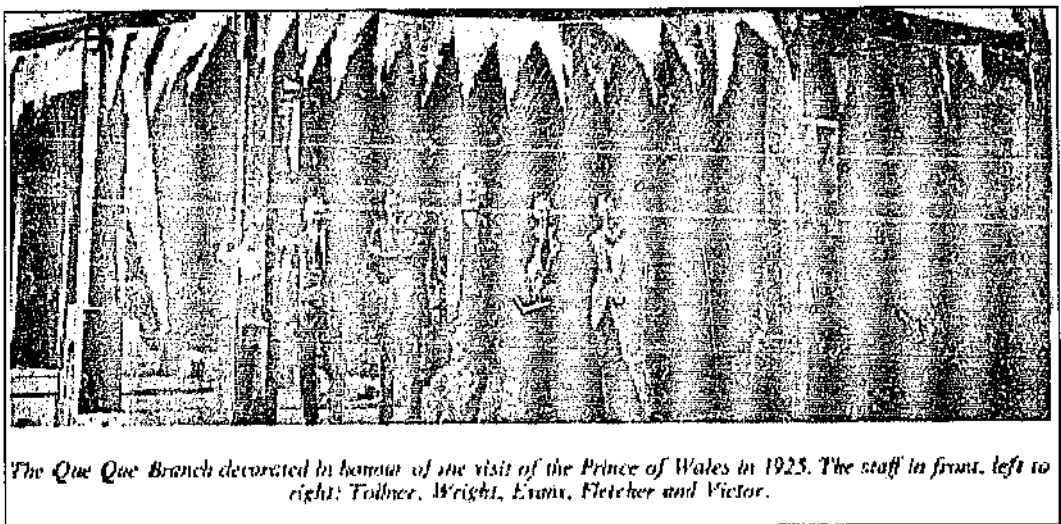
(B)

Source: Standard Chartered Bank (1967, p38) "Three Quarters of A Century..."
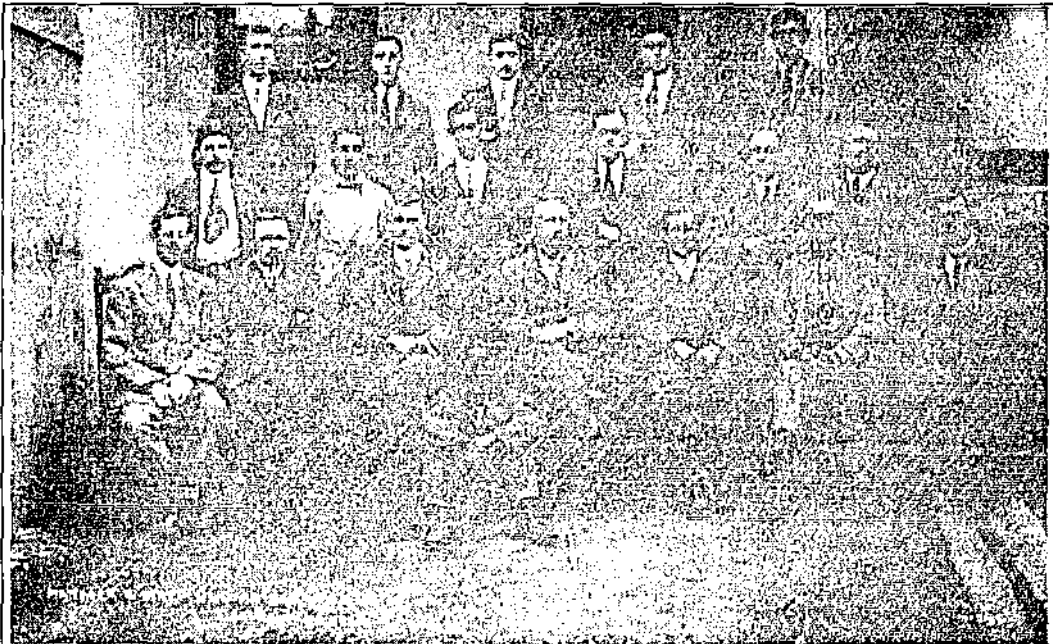
Manager and Staff of the Standard Bank's Salisbury Branch in December, 1915.

(C)

Note: Staff details not given. However as in panel A and B sitting arrangements appear institutionalised.

Source: Standard Chartered Bank (1967, p34) "Three Quarters of A Century…"

Figure 35   Images of institutionalised racism at the work place?

Appendix 4: Sources of data

POP – Population: 1901 to 1953 from B. R. Mitchell (1998) Table A5 pp 50-51; 1954 to 1998 from Central Statistics Office [CSO] (2000) "National Accounts" Table 7.1 pp 33 - 37. Please note that this series in thousands and not millions as reflected on the CSO table.

GDP – Gross Domestic Product: 1901 to 1952 from B. R. Mitchell (1998) Table J1 pp 1010 & 1024; 1954 to 1998 from Central Statistics Office [CSO] (2000) "National Accounts" Table 7.1 pp 33 - 37.

CPI – Consumer Price Index: CPI data for 1914 to 1938 based on estimates by Mosley (1983, p 148); 1938 to 1974 from B. R. Mitchell (1998) Table H2 pp 954 - 51; 1975 to 1998 from RBZ Quarterly Statistical and Economic Review - various. Note that the based year is 1990. Thus CPI in 1990 = 100

LPCY – Log real per capita GDP: Indicator of economic development. **LGPCY**, which stands for the log of growth in real per capita income (mathematically expressed as a log difference of real per capita GDP) measures economic activity.

Deflation: Ideally financial balance sheet items (FBI) are deflated by end of year consumer price index (CPI) while the annual CPI deflates GDP. No reliable annual CPI is available in Zimbabwe for the period under review, thus end of period CPI was used to deflate GDP. All indictors of the size and activity of financial intermediaries based on GDP as the denominator are given as ratios of average real financial balance sheet items to real GDP. Mathematically

$$\frac{0.5\left(\dfrac{FBI_t}{CPI_t} + \dfrac{FBI_{t-1}}{CPI_{t-1}}\right)}{\dfrac{GDP_t}{CPI_t}}$$

Logarithms: The econometric evidence in this study is largely based on data in logarithm format. Where necessary, appropriate measures of financial intermediation size and activity are expressed into logarithm transformation as follows:

$$\ln\left(\frac{0.5\left(\dfrac{FBI_t}{CPI_t} + \dfrac{FBI_{t-1}}{CPI_{t-1}}\right)}{\dfrac{GDP_t}{CPI_t}}\right)$$

G – Government Size: Real government expenditure to real GDP. Government expenditure for period 1895 to 1928 from Southern Rhodesia Official Yearbook No. 2 –30 page 526. 1929 to 1984 from B. R. Mitchell (1998)[z] Table G2 pp 889, 893 & 897; 1985 to 1998 from RBZ Quarterly Statistical and Economic Review - various. The figure of £48 ($96) for the year 1948 appears to be an outlier hence may be replaced by an average of the adjacent figures. No adjustment has been made to the figures to accommodate the decrease in Rhodesian expenditure during the period of the Federation.

FSB – Fiscal Balance: obtained from log (central government revenue) less log (central government expenditure).

Open – Openness to Trade: calculated as $\ln\left(\dfrac{real\ \text{exports} + real\ \text{imports}}{real\ GDP}\right)$. Data sources for exports and imports are as follows: 1900 to 1964 from B. R. Mitchell (1998) Table E1 pp 522, 528 & 535; 1964 to 1983 from Central Statistics Office [CSO] (1983) "Summary of External Trade " Table 1. The series for 1985 to 1998 is from CSO (2000) "Summary of External Trade" Table 7.12 p57. Later editions have revised some CSO publications between 1965 and 1980.

CAB – Current Account Balance: derived from log (exports) minus log (imports). This approach circumvents the calculation of logarithms on negative values, which are inevitable on the convectional CAB.

LTECH – Calculated as the logarithm of telephone lines per capita, is an indicator the rate of usage of communication technologies. Telephone lines data 1922 to 1993 from B. R. Mitchell (1998) Table F8 pp 803 and 807. Missing observation is extrapolated. Comparable data for later years is available from the World Development Indicators (WDI).

CIC – Currency in Circulation: 1925 to 1990 from B. R. Mitchell (1998) Table G1 pp 824 & 829; 1990 to 1998 from RBZ Quarterly Statistical and Economic Review (QESR) Vol 21 No. 1&2 (1999); and various QESR. Figure for 1924 is own estimate. Figures for 1951 and 1952 are from Sowelem.

---

[z] It must be noted that the time series data in Mitchell prior to 1924 appears to be recorded against a one year lagged time period. This means that the realisation in Mitchell for year t corresponds to the observation for year t+1 in the original sources, such as The Official Year Book of the colony of Southern Rhodesia No. 2 – 1930. The same observation goes for government revenue recorded in Mitchell Table G6.

LQL – Liquid liabilities: 1979 to 1998 from IMF (1999, pp 956-957) "International Financial statistics Yearbook", line 551. 1900 to 1978 estimated via summation of currency in circulation; deposits with the central bank, commercial banks, merchant banks, finance houses, building societies, the POSB; and money at call with discount houses. Prior to 1946, commercial banks and the POSB were the main intermediaries. Demand deposits constituted the bulk of deposits. Data from B. R. Mitchell (1998) Table G2 pp 843 and 847; Table G3, pp 859 and 863; Central Statistics Office [CSO] Monthly Digest of Statistics – various and from various RBZ QESR e.g. Vol 21 No. 1/2 or Vol 22 No. 3/4 (1999).

RBZ – Reserve Bank of Zimbabwe: Central bank assets from 1924 to 1938 represented by currency in circulation. Assets of the Southern Rhodesia Currency Board take care of the period 1938 to 1955. By law the currency board's assets corresponded to its monetary liabilities. See Newlyn and Rowan (1954, p70) Table X. Period 1951 to 1963 from Sowelem (1967, p244) Table 9.1 lines 2 (a) (ii) and 2 (d) being external and internal assets. The Cental Bank was established in 1956. 1964 figure is average of adjacent values. To generate a series 1965 to 1974, total assets of the relevant institutions are netted out of the total banking sector[aa] figure recorded in the CSO Monthly Digest of Statistics (MDS) for Dec. 1970, 1973, and 1978; 1975 to 1998 from RBZ QESR Vol 2 (1999).

DMB – Demand Deposit Banks: comprise of discount houses, commercial banks, and merchant banks also known as accepting houses. **NB.** RBZ figures for total assets of merchant banks from 1975 onwards are not comparable to records of the Registrar of Banking Institutions. RBZ series is net of acceptances whereas the Registrar's series includes acceptances. This research adopts the Reserve Bank's approach toward acceptances.

OBI – Other Banking Institutions: refer to building societies, finance houses, and the POSB. **NB.** RBZ and the Registrar of Building Societies have a different approach to the components of capital and deposits of building societies. The Reserve Bank series regards subscription share capital as deposits while the Registrar treats fixed subscriptions as part of capital.

[aa] The CSO the RBZ define the banking sector differently. The banking sector as defined by the CSO (see CSO MDS Dec 1973, p82) comprises of commercial banks, accepting houses, discount houses, finance houses, building societies, the AFC, and POSB. RBZ QESR define the baking sector as constituting of the Reserve Bank, discount houses, commercial banks, and accepting houses.

CMBA – Commercial Banks Assets: 1924 to 1935 estimated on the basis of bank liabilities, especially bank deposits. Data for 1936 to 1948 was obtained from CSO via a private source. Data for 1954 to 1975 is from CSO MDS (1973, p50) Table 62 and (1980, p33) Table 28. The Ministry of Finance's "Economic Survey of Rhodesia 1965 [ESR]" Table 10 fills the gap between 1960 and 1963. In a few instances, liability side totals have also been used to make up for gaps on the asset side. Good data for 1975 to 1998 ex RBZ QESR.

CMLA – Commercial Banks Loans and Advances: 1924 to 1938 constructed on the basis of best available data basis; 1939 to 1952 based on movements in local earning assets in Newlyn and Rowan (1954, pp 170-1), Table IV and Figure 1. Efforts to obtain the original sources, viz "The Economic and Statistical Bulletins" were not yet fruitful at the time of writing. Data for 1954 to 1975 is from CSO 1973 and 1978 Tables 10 and 21 respectively. Data from 1975 to 1998 was taken from RBZ QESR.

CMLG – Commercial Banks Loans to Government series was constructed as follows; 1952 to 1964 ex-Sowelem (1967, p221) Table 8.1 line 9 (b) (i), 1964 to 1979 from CSO MDS (1970, 1973, 1978 and 1980).

CMLQ – Commercial Banks Liquid Assets: 1954 to 1963 Ministry of Finance [MOF] ESR 1965. Data for 1961 to 1963 refers to bills of exchange only. 1965 to 1975 data is from CSO records. And RBZ QESR takes care of period 1975 to 1998.

MB – Merchant Banks Assets: 1957 to 1975 CSO MDS (1970, p45) and (1980, p37) Tables 55 and 32 respectively. 1975 to 1998 RBZ QESR.

MBLA – Merchant Banks Loans and Advances: 1957 to 1975 CSO MDS and RBZ QESR for the period 1975 to 1998.

MBLQ – Merchant Banks Liquid Assets: Data for period 1957 to 1974 from the records of the Registrar of Banking Institutions. 1975 to 1998 RBZ QESR.

DHA – Discount House Assets: 1960 to 1975 CSO MDS 1973 and 1978 Tables 72 and 24 respectively. 1975 to 1998 RBZ QESR.

FH – Finance Houses Assets: 1953 to 1963 based on Sowelem (1967, p185) Table 6.2 and National Archives. Efforts to obtain the original sources viz "Quarterly Bulletin of Financial Statistics" were not yet fruitful at the time of writ-

ing. Data for 1964 to 1974 ex CSO MDS and MOF ESR; 1975 to 1998 RBZ QESR. **NB** Finance Houses total assets for the period 1994 to 1997 have been corrected for mathematically inaccuracy.

FHLA – Finance Houses Loans and Advances: 1953 to 1963 as above.

POSB – People's Own Savings Bank: Assets for period 1924 to 1965 estimated from the liability side of the balance sheet using the data in Mitchell and Southern Rhodesia Statistical Yearbook (1947); 1964 to 1974 CSO MDS – various; 1975 to 1998 RBZ QESR.

POLQ – POSB Liquid Assets: 1975 to 1998 RBZ QESR.

BSA – Building Society Assets: 1951 to 1996 Registrar of Building Societies Annual Reports; and 1975 to 1998 RBZ QESR.

BSLA – Building Society Loans and Advances: As in BSA

BSLQ – Building Society Liquid Assets: AS in BSA

AFC – Agricultural Finance Corporation: Originally known as the Land Bank; 1924 to 1952 National Archives records and (1947) "Statistical Year Book"; 1954 to 1998 from various e.g. CSO MDS (1973, p 62); (1987, p75); (1992, p45) and (1998, p59) Tables 75, 20.6, 18.6, and 19.10 respectively.

AFLA – A FC Loans and Advances: Sources as in AFC above.

INS – Insurance Assets: 1924 to 1946 from the Southern Rhodesia (1947) "Statistical Year Book"; 1953 ex- Sowelem; 1957 to 1962 cover the whole Federation; 1965 to 1998 records at rhe National Archives and Report of the Registrar of Insurance Companies – various.

INPC – Insurance Private sector Credit: Constructed from (i) mortgages on property; (ii) loans on insurance policies; (iii) and loans on personal securities. Sources are as in INS above. 1929 to 1945 credit figures are estimates.

PPF – Provident and Pension Funds: 1977 to 1998 ex-Registrar of Pension and Provident Funds Annual Reports

PSC – Total Private Sector Credit; **PCDMB, PCOBI, PCDFI**; and **PCNBFI** refers to DMB, OBI, DFI and NBFI Private Sector Credit respectively.

IPI – Industrial Share Price Index: Main equity index on the Zimbabwe Stock Exchange. 1964 to 1976 from various CSO MDS; 1975 to 1998 RBZ QESR.
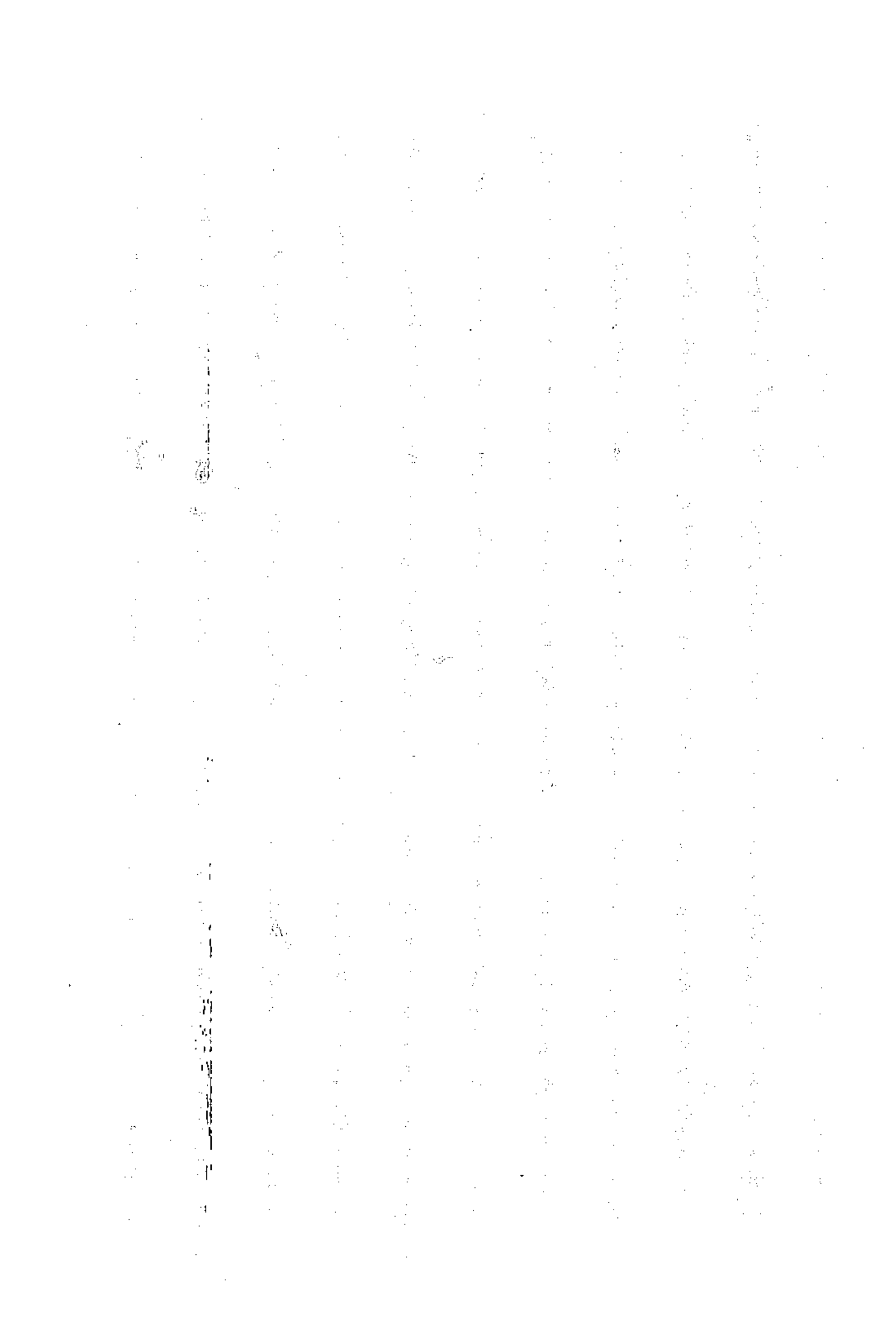
Table 23

Original data set

Date	POP	GDP	CPI	G	REV	Exports	Imports	RBZ	CMBA	LQL	CIC	TFA	BK	DMB	OBI	NSFI	OFI	PCBK	PCDMB	PCOBI	PCNBFI	PCDFI	SMC	IPI
1924	949	22	10.6	2.7	3.04	6.30	7.91	1.55	5.42	6.11	1.55	9.10	6.97	5.42	0.33	1.20	0.60	1.94	1.7	0	0.00	0.24		
1925	964	20	10.2	3.2	3.20	7.28	9.57	1.58	5.59	6.27	1.58	9.69	7.17	5.59	0.33	1.29	0.90	2.76	1.9	0	0.00	0.86		
1926	979	24	9.4	3.5	3.68	7.91	12.56	1.60	6.23	6.82	1.60	11.20	7.83	6.23	0.36	1.60	1.41	3.38	2.1	0	0.00	1.28		
1927	1,012	28	8.5	4	4.02	9.69	14.96	1.78	6.32	7.12	1.78	12.20	8.10	6.32	0.41	1.98	1.71	4.15	2.5	0	0.00	1.65		
1928	1,051	28	8.3	4.3	4.33	10.96	16.66	1.91	6.67	7.56	1.91	13.77	8.58	6.67	0.45	2.45	2.30	4.77	2.6	0	0.00	2.17		
1929	1,074	28	7.2	5.9	4.67	12.31	17.47	1.99	6.97	7.89	1.99	14.57	8.96	6.97	0.46	3.15	2.00	4.54	2.8	0	0.00	1.74		
1930	1,100	25	5.8	6	4.97	10.40	14.94	1.81	7.44	8.06	1.81	15.37	9.25	7.44	0.45	3.65	2.03	5.22	3	0	1.47	1.75		
1931	1,135	18	5.4	6	4.90	7.21	10.98	1.23	7.91	7.74	1.23	15.68	9.14	7.91	0.47	4.00	2.07	5.4*	3.1	0	1.58	1.77		
1932	1,156	19	5.7	5.5	4.22	5.59	8.05	1.16	8.11	8.01	1.16	16.28	9.27	8.11	0.58	4.20	2.23	5.35	2.9	0	1.68	1.77		
1933	1,186	22	5.4	4.8	4.54	5.35	8.85	1.13	7.91	8.62	1.13	16.26	9.04	7.91	0.69	4.47	2.06	6.33	2.8	0	1.73	1.80		
1934	1,236	26	4.5	9.7	4.93	7.09	10.44	1.33	9.28	10.16	1.33	18.41	10.61	9.28	0.83	4.70	2.19	7.14	3.3	0	1.82	2.02		
1935	1,283	30	5.6	6.2	5.44	7.66	12.68	1.56	10.89	11.86	1.56	21.00	12.45	10.89	1.00	5.35	2.21	8.19	3.9	0	2.43	1.86		
1936	1,322	34	5.2	7.3	5.84	8.91	13.72	1.90	12.42	14.28	1.90	23.55	14.32	12.42	1.18	6.00	2.05	9.18	4.7	0	2.71	1.77		
1937	1,359	38	5.4	8.2	6.12	12.48	16.84	3.24	13.05	15.27	3.24	26.17	16.29	13.05	1.43	6.49	1.96	9.15	4.5	0	2.94	1.71		
1938	1,406	42	5	6.5	6.87	12.21	19.21	2.41	14.84	16.27	2.41	27.81	17.25	14.84	1.66	6.96	1.94	10.07	5.1	0	3.26	1.71		
1939	1,444	56	5.1	10.4	7.03	11.49	17.67	3.52	16.50	19.97	4.40	31.59	20.02	16.50	1.97	7.62	1.98	11.09	5.8	0	3.59	1.70		
1940	1,461	58	5.2	11.3	6.74	16.01	18.55	4.07	17.48	24.58	5.47	33.82	21.55	17.48	2.51	7.88	1.88	11.13	5.8	0	3.68	1.65		
1941	1,501	64	5.4	15.8	11.24	17.67	19.66	4.42	21.00	29.91	6.28	39.18	25.42	21.00	3.63	8.32	1.81	12.28	7	0	3.79	1.49		
1942	1,553	66	5.7	17	13.52	19.90	18.90	5.19	26.78	38.16	7.25	47.48	31.97	26.78	4.91	9.00	1.60	11.52	5.8	0	4.26	1.46		
1943	1,606	68	6.1	19	16.70	19.19	16.76	6.13	31.38	46.05	9.06	55.79	37.51	31.38	6.80	9.82	1.66	11.63	5.8	0	4.51	1.32		
1944	1,566	72	6.2	28	20.80	21.57	23.16	6.78	37.02	56.34	11.16	65.48	43.80	37.02	8.99	11.04	1.65	14.96	8.2	0	5.38	1.40		
1945	1,728	82	6.4	24	21.00	26.00	24.00	7.82	44.91	67.51	12.27	78.17	52.73	44.91	11.14	12.45	1.85	17.17	9.4	0	5.59	2.18		
1946	1,730	96	6.7	28	22.20	32.00	40.00	8.60	50.10	75.31	13.98	87.20	58.70	50.10	12.52	13.97	2.02	21.93	14.2	0	8.08	1.65		
1947	1,850	118	6.9	26	22.40	38.00	66.00	8.53	60.14	88.82	16.86	102.16	68.67	60.14	13.86	15.98	3.65	34.44	23.6	0	7.59	3.25		
1948	2,010	144	7.6	96	25.40	50.00	86.00	9.91	65.16	103.96	17.74	114.45	75.07	65.16	15.82	18.99	4.57	39.06	25.8	0	9.09	4.17		
1949	2,090	164	7.9	44	27.20	48.00	108.00	10.98	71.25	108.31	18.04	131.88	82.23	71.25	18.07	23.10	8.48	55.16	36.4	0	10.68	8.08		
1950	2,170	202	8.5	50	33.80	68.00	118.00	18.62	82.13	125.73	18.62	159.26	100.75	82.13	21.97	25.80	10.73	63.8	42.4	0	11.07	10.33		
1951	2,330	216	9.1	60	36.00	72.00	172.00	26.00	93.06	134.81	20.06	188.03	119.06	93.06	24.75	31.51	12.72	86.66	60.3	0	14.04	12.32		
1952	2,430	254	9.8	80	42.00	88.00	176.00	29.60	102.35	135.97	20.47	215.18	131.95	102.35	31.54	36.72	14.97	86.47	52.2	3.2	16.50	14.57		
1953	2,530	266	10.1	96	58.00	94.00	154.00	33.80	110.00	127.62	20.87	241.63	143.80	110.00	39.75	42.49	15.59	91.06	49.2	7.6	18.97	15.29		
1954	3,170	351	10.1	84	52.00	85.00	250.00	36.40	117.60	164.45	20.38	279.73	154.00	117.60	57.63	51.90	16.20	87	32.7	15	23.30	16.00		
1955	3,270	385	10.3	72	26.00	90.00	276.00	40.00	130.40	209.52	23.08	331.05	170.40	130.40	77.25	66.80	16.60	124.1	49.8	29.3	29.80	16.20		
1956	3,308	447	10.7	68	28.00	96.00	318.00	46.80	145.40	232.59	24.40	386.74	192.20	145.40	95.04	81.70	17.80	143.1	49.4	42.2	34.30	17.20		
1957	3,500	500	11	100	34.00	116.00	354.00	69.60	136.80	249.93	23.93	456.37	220.80	151.20	119.57	96.60	19.40	184.1	67.6	57.7	39.80	19.00		

259

Date	POP	GDP	CPI	G	REV	Exports	Imports	RBZ	CMBA	LQL	CIC	TFA	BK	DMS	OBI	NBFI	DFI	PCBK	PCDMB	PCOBI	PCNBFI	PCDFI	SMC	IPI
1958	3.610	518	11.4	98	40.00	98.00	314.00	84.40	124.60	239.82	24.34	495.68	217.90	133.50	137.78	118.60	21.40	200.6	58.2	75	46.60	20.80		
1959	3.730	555	11.7	98	40.00	114.00	300.00	88.40	132.80	265.00	25.71	559.85	232.30	143.90	167.75	137.20	22.60	232.03	68.4	90.43	51.00	22.20		
1960	3.840	603	12	104	40.00	124.00	314.00	86.60	138.00	286.44	27.13	607.63	253.90	167.30	181.53	146.80	25.40	256.29	76.1	101.39	53.50	25.20		
1961	3.970	628	12.4	114	42.00	142.00	310.00	101.00	139.00	295.93	28.72	638.42	277.00	176.00	175.02	158.50	27.80	265.94	84.5	96.44	57.40	27.60		
1962	4.100	640	12.6	114	50.00	146.00	288.00	116.80	146.90	304.00	28.02	670.82	304.60	187.80	171.22	165.00	30.00	286.56	84.9	94.06	58.00	29.60		
1963	4.230	684	12.8	118	52.00	150.00	270.00	117.50	149.90	302.80	26.11	674.89	312.40	194.90	168.09	161.80	32.60	266.84	88.6	89.97	55.87	32.40		
1964	4.350	697	13.1	114	94.00	274.80	216.60	119.10	159.40	305.36	24.20	672.10	328.90	209.80	159.30	150.00	33.90	271.64	101.1	83.4	53.74	33.40		
1965	4.490	751	13.3	164	150.00	322.80	239.60	119.40	174.50	319.84	24.20	680.39	346.40	227.00	158.30	138.19	37.50	262.01	93.4	79.9	51.61	37.10		72.27
1966	4.630	734	13.7	188	148.00	188.00	169.50	120.50	190.80	364.17	26.20	733.44	373.00	252.50	174.90	147.54	38.00	242.29	73.7	82.08	48.81	37.70		85.49
1967	4.790	800	13.9	180	156.00	188.40	187.10	123.70	210.00	412.40	28.40	808.16	407.30	283.60	203.80	158.06	39.00	258.79	79	95.59	45.80	38.40		93.80
1968	4.960	847	14.2	208	166.00	192.30	207.10	127.20	208.80	425.15	28.60	865.27	405.70	278.50	243.20	172.77	43.60	306.94	95.8	124.82	43.42	42.90		111.43
1969	5.130	1,001	14.6	248	184.00	230.80	199.50	129.90	241.30	508.33	33.60	995.33	450.50	320.60	312.00	188.93	43.90	340.11	97.1	153.99	45.72	43.30		163.10
1970	5.310	1,080	15.1	241	204.00	258.70	235.00	146.40	269.60	594.39	34.40	1136.03	504.30	357.90	376.80	208.83	46.10	409.92	126.6	189.97	47.85	45.50		222.15
1971	5.466	1,244	15.6	266	213.00	290.20	282.50	150.20	294.70	683.07	37.90	1268.84	573.40	423.20	406.50	231.54	57.40	481.55	157.1	226.7	48.56	49.20		194.32
1972	5.627	1,419	16.2	251	244.00	349.10	274.70	155.20	335.80	776.85	44.40	1443.11	653.70	498.50	475.20	256.61	57.60	525.92	157.4	269.17	48.95	50.40		195.99
1973	5.792	1,553	16.8	279	270.00	389.10	308.60	194.80	400.70	890.21	49.10	1705.39	807.80	613.00	551.00	286.39	60.20	615.25	189.4	322.51	50.94	52.40		249.20
1974	5.962	1,861	18.1	349	318.00	531.20	438.30	219.90	459.40	1007.47	61.50	1926.28	922.30	702.40	611.70	324.28	68.00	727.24	244.8	368.38	52.26	61.80		299.33
1975	6.137	1,998	19.5	415	401.00	531.30	461.90	224.10	608.50	1190.39	66.90	2196.97	1090.50	866.40	661.50	364.87	80.10	773.69	274.7	369.62	55.07	74.30		332.50
1976	6.317	2,166	21.3	539	492.00	557.40	382.70	279.30	658.50	1299.29	79.10	2575.90	1374.00	1094.70	698.10	414.90	88.90	820.39	299.4	380.06	56.73	84.20	336.50	247.60
1977	6.503	2,198	23.3	673	575.00	550.80	388.10	300.00	675.30	1367.97	83.90	2703.29	1403.50	1103.50	745.30	457.09	97.40	844.21	309.5	386.55	54.26	93.90	507.50	190.96
1978	6.694	2,359	24.8	802	573.00	609.30	403.70	265.40	700.10	1488.76	95.20	2923.64	1467.20	1201.60	809.50	537.94	109.00	861.57	316	400.19	51.98	93.40	675.00	205.65
1979	6.891	2,822	27.6	881	611.00	715.70	549.30	391.30	764.20	1668.00	108.00	3337.37	1715.90	1324.60	893.90	602.87	124.70	880.68	311.8	419.33	47.15	102.40	840.00	301.47
1980	7.094	3,441	30.2	1198	829.00	909.20	809.40	428.20	980.90	2048.00	157.00	3674.71	1823.90	1395.70	1020.40	691.11	139.30	962.84	312	471.23	40.81	138.80	918.00	405.82
1981	7.302	4,433	34.6	1301	1128.00	971.70	1017.70	662.00	1227.30	2265.00	199.00	4508.87	2264.30	1602.30	1186.40	772.19	285.98	1378.8	544.7	514.87	44.43	274.80	507.00	325.35
1982	7.608	5,197	35.7	1882	1513.00	968.40	1081.80	695.90	1438.90	2695.00	237.00	5035.55	2547.30	1851.40	1246.40	921.35	320.50	1739	880.9	511.85	42.45	303.80	326.00	171.14
1983	7.851	6,306	43.9	2079	1866.00	1150.20	1061.60	1015.60	1508.70	2657.00	227.00	5844.06	2960.60	1945.00	1335.70	1124.66	423.10	1874.46	861.3	561.42	45.84	405.90	293.00	135.56
1984	8.101	6,404	52.8	2545	2033.00	1453.00	1200.70	1006.90	1792.70	3003.00	259.00	6709.86	3321.40	2314.50	1511.00	1389.06	488.40	1888.39	772.2	603.17	45.43	467.60	264.00	114.62
1985	8.387	9,097	57.3	2891	2353.00	1795.50	1446.50	1053.70	2062.60	2623.00	321.00	7712.81	3663.60	2609.90	1788.50	1712.21	548.50	2054.16	857.9	648.63	46.33	501.30	591.00	227.75
1986	8.650	10,361	65.5	3395	2848.00	2170.30	1640.40	1158.50	2251.20	3941.00	380.00	8747.15	3936.20	2777.70	2130.80	2055.45	624.70	2461.38	1117.5	747.94	52.44	543.50	688.00	274.21
1987	8.922	11,200	73.1	4057	3405.00	2371.40	1741.70	1241.40	2623.70	4878.00	389.00	10420.29	4567.70	3326.30	2513.30	2550.39	788.90	2843.54	1261	901.79	62.96	617.80	1194.00	338.44
1988	9.202	14,109	78.2	4625	3974.00	2965.90	2043.20	1370.60	3189.90	5180.00	503.00	12374.75	5516.50	4145.70	3044.90	2998.25	815.10	3545.53	1703.4	1,133.88	65.75	642.50	1504.00	552.61
1989	9.491	17,509	89	5589	4703.00	3267.30	3438.10	1476.40	3997.80	7483.00	618.00	15190.90	6498.90	5022.50	3824.90	3951.60	915.50	4628.53	2240.6	1,541.02	91.61	755.30	2396.00	869.13
1990	9.789	21,494	100	6909	6011.00	4231.00	4528.30	2177.60	4756.90	8991.00	770.00	19207.37	8106.40	5928.80	5036.80	4964.77	1099.40	5962.29	2689	2,235.63	130.86	855.80	6373.00	2282.76
1991	10.096	29,623	123.3	8232	8016.00	5529.90	7397.20	4582.30	6119.80	10070.00	889.00	26700.69	12413.00	7830.70	6437.50	6286.85	1563.30	9119.94	4569.5	3,159.03	133.31	1258.10	7020.00	1953.61
1992	10.413	34,392	175.2	11574	10064.00	7331.10	11232.30	6111.90	8062.00	10865.00	861.30	33487.30	16851.00	10739.10	6721.10	7497.00	2418.20	11052.5	5577.1	3,462.00	186.90	1824.50	3440.00	865.55
1993	10.779	42,481	223.6	13442	11752.00	10161.10	11773.10	7180.50	14900.00	15758.00	1191.40	49891.30	29554.00	22373.50	9768.50	11577.50	2201.80	13911.6	8406.9	3,470.00	290.90	1743.80	9937.00	2325.26
1994	11.150	56,159	273.4	16583	14502.00	16261.50	18270.70	9852.20	20274.60	21583.00	1432.40	65094.00	39557.30	29705.10	11377.20	14353.16	2890.00	15958.51	9543.5	4,119.50	310.91	1984.60	15292.00	3160.80
1995	11.526	61,622	335.1	22000	18687.00	18359.10	23048.10	12123.40	24668.60	27768.00	1750.60	85597.86	50935.10	38811.70	17419.60	14353.16	2890.00	17760.91	9660.3	5,516.10	366.11	2216.40	18988.00	3972.62
1996	11.908	84,759	406.9	29661	23781.00	24209.30	28095.10	14330.80	32647.50	38243.00	2342.40	114624.82	67190.70	52859.90	24339.50	18527.82	4566.80	24147.77	12704	7,854.30	396.37	3193.10	39337.00	8786.26
1997	12.294	102,074	483.6	36515	31226.00	30207.30	36555.10	19176.00	48647.50	49592.00	3395.90	156273.02	95346.30	76170.30	31864.10	22716.32	6346.30	39883.95	23027.4	11,883.30	443.05	4530.20	36222.00	7196.43
1998	12.685	135,722	636.9	50107	43124.00	45208.20	59350.00	37343.20	57963.90	53851.00	4265.20	205071.30	136500.10	99156.90	31697.80	28395.40	8478.00	55893.5	34842.5	14,469.70	531.60	6049.70	48770.00	5884.72

Table 24

Transformed data set and proxies

Date	Y	BKA	RBZA	DMBA	OBIA	DMRB	CIC	TFA	LQL	RBZ	DMB	OBI	NBFI	DFI	PCDMB	PCOBI
1924	215.69	-0.266659	-1.770020	-0.518179	-3.316937	-0.251519	-3.384401	-1.576594	-1.941399	0.033898	-2.132560	-4.207658	-3.640334	-4.333482	-3.292028	
1925	192.31	-0.301189	-1.813670	-0.550115	-3.379757	-0.248926	-2.547292	-0.754581	-1.172008	0.078293	-1.289409	-4.104025	-2.775532	-3.282402	-2.406508	
1926	244.9	-0.358207	-1.947161	-0.586537	-3.437565	-0.228331	-2.712396	-0.827317	-1.295838	0.066334	-1.397533	-4.238824	-2.803909	-3.024821	-2.481201	
1927	312.85	-0.409819	-1.925947	-0.657717	-3.393034	-0.247898	-2.802271	-0.867938	-1.386812	0.060601	-1.492739	-4.280926	-2.742135	-2.879282	-2.492402	
1928	333.33	-0.473525	-1.977486	-0.724872	-3.421000	-0.251348	-2.719164	-0.767549	-1.338236	0.065822	-1.460709	-4.175479	-2.535548	-2.635081	-2.395736	
1929	361.29	-0.485971	-1.989826	-0.737349	-3.455493	-0.251378	-2.657871	-0.674027	-1.281437	0.070069	-1.405736	-4.113834	-2.288704	-2.566917	-2.331279	
1930	371.43	-0.508227	-2.141303	-0.725547	-3.530925	-0.217320	-2.616780	-0.550469	-1.180528	0.072996	-1.281573	-4.045052	-2.031406	-2.556534	-2.191584	
1931	295.08	-0.539507	-2.543747	-0.684258	-3.507409	-0.144751	-2.480543	-0.133519	-0.812355	0.083661	-0.835640	-3.651153	-1.530321	-2.159089	-1.760095	
1932	342.34	-0.563370	-2.643243	-0.696839	-3.334665	-0.133470	-2.764771	-0.172878	-0.880479	0.062993	-0.863355	-3.590901	-1.533381	-2.179683	-1.844196	
1933	396.4	-0.587049	-2.666491	-0.720580	-3.159772	-0.133531	-2.955261	-0.301005	-1.971260	0.052021	-1.009958	-3.542104	-1.622749	-2.327567	-2.043467	
1934	525.25	-0.551474	-2.630727	-0.685032	-3.099224	-0.133558	-3.035420	-0.391448	-1.002725	0.047970	-1.091398	-3.515896	-1.715279	-2.491547	-2.127232	
1935	594.06	-0.523123	-2.602404	-0.656678	-3.044522	-0.133554	-3.029861	-0.415576	-0.998986	0.048187	-1.086947	-3.488265	-1.773058	-2.600910	-2.117448	
1936	629.63	-0.497189	-2.515169	-0.639818	-2.993611	-0.142628	-2.973234	-0.419405	-0.951240	0.051142	-1.066825	-3.435757	-1.786799	-2.772084	-2.062933	
1937	716.98	-0.474062	-2.089040	-0.695826	-2.906939	-0.221763	-2.698255	-0.424965	-0.944990	0.067377	-1.093343	-3.372836	-1.806189	-2.941942	-2.110764	
1938	807.69	-0.477584	-2.445769	-0.628069	-2.818578	-0.150486	-2.703347	-0.439555	-0.976983	0.066981	-1.098603	-3.298307	-1.829014	-3.067869	-2.165172	
1939	1108.91	-0.456109	-2.194380	-0.649480	-2.774807	-0.193371	-2.802906	-0.634737	-1.129249	0.052853	-1.274030	-3.430014	-2.039198	-3.351442	-2.330274	
1940	1126.21	-0.450677	-2.117409	-0.659995	-2.600770	-0.209318	-2.465049	-0.573152	-0.957844	0.065391	-1.228004	-3.255044	-2.012819	-3.400990	-2.302491	
1941	1207.55	-0.432630	-2.181574	-0.623644	-2.378934	-0.191093	-2.389123	-0.562601	-0.855503	0.066315	-1.203263	-3.040297	-2.067176	-3.545454	-2.304000	
1942	1189.19	-0.395511	-2.213190	-0.572653	-2.269035	-0.177205	-2.279101	-0.422671	-0.664846	0.072729	-1.018739	-2.741369	-2.031271	-3.654142	-2.330095	
1943	1152.54	-0.396987	-2.208074	-0.575424	-2.104672	-0.178490	-2.123496	-0.276890	-0.481211	0.083126	-0.850992	-2.456548	-1.978063	-3.731200	-2.460500	
1944	1170.73	-0.402111	-2.268358	-0.570286	-1.985632	-0.168084	-1.963920	-0.172378	-0.341638	0.089608	-0.745045	-2.211499	-1.932389	-3.773298	-2.332085	
1945	1301.59	-0.393701	-2.302201	-0.554225	-1.948344	-0.160524	-1.946350	-0.133638	-0.282008	0.088921	-0.695279	-2.099100	-1.943993	-3.845915	-2.232798	
1946	1465.65	-0.395765	-2.316907	-0.554183	-1.940877	-0.158351	-1.990798	-0.150037	-0.296693	0.085452	-0.704240	-2.094522	-1.984168	-3.904140	-2.100393	
1947	1735.29	-0.397228	-2.482716	-0.529865	-1.997533	-0.132666	-2.036177	-0.221128	-0.364169	0.072596	-0.762296	-2.191757	-2.065074	-3.733477	-1.834970	
1948	1986.21	-0.421717	-2.446997	-0.563292	-1.978863	-0.141522	-2.118002	-0.285272	-0.402874	0.053940	-0.831852	-2.273347	-2.110301	-3.559339	-1.762829	
1949	2116.13	-0.472372	-2.485999	-0.615698	-1.987639	-0.143301	-2.215412	-0.287337	-0.435196	0.063631	-0.877838	-2.270805	-2.054721	-3.229320	-1.665588	
1950	2463.41	-0.457896	-2.146302	-0.662235	-1.980678	-0.204339	-2.398968	-0.329718	-0.547046	0.072668	-0.969756	-2.313670	-2.112320	-3.048821	-1.635952	
1951	2454.55	-0.456974	-1.978505	-0.703357	-2.027938	-0.246383	-2.413210	-0.219931	-0.505456	0.102824	-0.903521	-2.225115	-2.022190	-2.915350	-1.441410	
1952	2687.83	-0.489052	-1.983701	-0.743077	-1.920218	-0.254025	-2.527441	-0.232148	-0.627990	0.109336	-0.955771	-2.203144	-2.009057	-2.911150	-1.503492	-5.103698
1953	2673.37	-0.518984	-1.966947	-0.786927	-1.804748	-0.267943	-2.554732	-0.153022	-0.701559	0.119081	-0.918724	-2.011370	-1.905412	-2.857122	-1.656897	-3.903031
1954	3475.25	-0.596872	-2.039256	-0.866536	-1.579782	-0.269664	-2.834282	-0.297493	-0.810712	0.100000	-1.126344	-1.975292	-2.006498	-3.094917	-2.148434	-3.435984
1955	3774.51	-0.664121	-2.113390	-0.931663	-1.455248	-0.267542	-2.875063	-0.232382	-0.670656	0.099184	-1.133372	-1.743351	-1.870927	-3.155985	-2.235530	-2.858479

261

Date	Y	BKA	RBZA	DMBA	OBIA	DMRB	CIC	TFA	LQL	RBZ	DMB	OBI	NBFI	DFI	PCDMB	PCOBI
1956	4257.14	-0.699216	-2.111869	-0.978264	-1.403497	-0.279048	-2.935564	-0.220645	-0.704781	0.096982	-1.176703	-1.648167	-1.796671	-3.257951	-2.198128	-2.529038
1957	4608.29	-0.726047	-1.880539	-1.104700	-1.339435	-0.378654	-3.029377	-0.171609	-0.729039	0.116107	-1.215450	-1.540361	-1.725253	-3.291850	-2.147543	-2.305542
1958	4625	-0.821894	-1.770363	-1.311829	-1.280258	-0.489935	-3.066145	-0.084924	-0.748552	0.148441	-1.290258	-1.393639	-1.573063	-3.234997	-2.106777	-2.057043
1959	4805.19	-0.879639	-1.845797	-1.358550	-1.205218	-0.478911	-3.099280	-0.050938	-0.788393	0.155655	-1.386973	-1.291180	-1.468496	-3.228111	-2.171961	-1.904611
1960	5088.61	-0.872626	-1.948266	-1.289778	-1.208145	-0.417152	-3.127976	-0.032819	-0.782856	0.145150	-1.355421	-1.239541	-1.446358	-3.224442	-2.122299	-1.839070
1961	5147.54	-0.834979	-1.843876	-1.288512	-1.294096	-0.453534	-3.113216	-0.008090	-0.768587	0.149215	-1.297229	-1.258645	-1.414430	-3.162100	-2.057360	-1.847600
1962	5120	-0.789501	-1.748038	-1.273123	-1.365563	-0.483622	-3.115973	0.022453	-0.757859	0.170068	-1.258207	-1.307337	-1.375201	-3.097867	-2.022308	-1.904799
1963	5228.35	-0.770265	-1.748111	-1.242063	-1.390074	-0.471798	-3.199701	0.013286	-0.783153	0.176438	-1.244262	-1.364398	-1.401942	-3.054929	-2.035358	-1.976094
1964	5382.24	-0.714653	-1.730444	-1.164252	-1.439618	-0.449599	-3.321155	-0.034147	-0.823399	0.169737	-1.237079	-1.448348	-1.496998	-3.042823	-1.995118	-2.083932
1965	5669.39	-0.675072	-1.740187	-1.097716	-1.458174	-0.422644	-3.434996	-0.104839	-0.876602	0.158796	-1.235318	-1.553679	-1.650572	-3.046580	-2.043763	-2.218744
1966	5437.04	-0.676167	-1.806096	-1.066335	-1.433531	-0.390167	-3.372034	-0.037935	-0.764429	0.163444	-1.119481	-1.483432	-1.636881	-2.967402	-2.171099	-2.204163
1967	5797.1	-0.685210	-1.876901	-1.047195	-1.377621	-0.361985	-3.377965	-0.037482	-0.723271	0.152619	-1.093806	-1.441515	-1.655672	-3.033995	-2.349483	-2.198330
1968	6028.47	-0.757428	-1.917281	-1.133624	-1.269157	-0.376196	-3.391720	-0.012468	-0.704413	0.148106	-1.102957	-1.333117	-1.633610	-3.021319	-2.272118	-2.040661
1969	6951.39	-0.792716	-2.036309	-1.132880	-1.160071	-0.340164	-3.472471	-0.074026	-0.764024	0.128428	-1.207257	-1.284103	-1.711515	-3.130118	-2.339631	-1.972633
1970	7272.73	-0.812124	-2.048952	-1.155041	-1.103581	-0.342918	-3.458270	-0.014176	-0.673360	0.127824	-1.158622	-1.144214	-1.692576	-3.178182	-2.269497	-1.838817
1971	8104.23	-0.794275	-2.133891	-1.098014	-1.138274	-0.303739	-3.538934	-0.034618	-0.683012	0.119219	-1.159629	-1.156071	-1.732204	-3.181177	-2.172804	-1.788111
1972	8924.53	-0.791907	-2.229841	-1.062952	-1.110820	-0.271045	-3.541619	-0.046289	-0.679649	0.107616	-1.125822	-1.170118	-1.760846	-3.205600	-2.199533	-1.745802
1973	9412.12	-0.747235	-2.169576	-1.023184	-1.129814	-0.275950	-3.503713	0.012405	-0.623180	0.112491	-1.029169	-1.108486	-1.744645	-3.272174	-2.193691	-1.659435
1974	10664.756	-0.736475	-2.170173	-1.008843	-1.147104	-0.272368	-3.518893	-0.025448	-0.674547	0.111322	-1.041267	-1.164074	-1.808383	-3.369305	-2.151887	-1.685124
1975	10627.66	-0.700443	-2.282742	-0.930488	-1.200324	-0.230045	-3.438079	0.030288	-0.599529	0.111226	-0.937496	-1.143831	-1.758399	-3.296821	-2.040940	-1.687781
1976	10617.647	-0.628473	-2.221668	-0.855719	-1.305592	-0.227246	-3.391923	0.095358	-0.553861	0.115868	-0.795725	-1.158079	-1.715666	-3.244238	-2.020933	-1.752805
1977	9856.5022	-0.655500	-2.198442	-0.895983	-1.288438	-0.240482	-3.294009	0.184008	-0.498789	0.131833	-0.691223	-1.113148	-1.617828	-3.161127	-1.975527	-1.744839
1978	9808.7318	-0.689474	-2.399347	-0.889009	-1.284168	-0.199535	-3.272193	0.175930	-0.502057	0.120184	-0.716532	-1.110354	-1.557933	-3.130105	-2.019940	-1.790810
1979	10770.992	-0.665245	-2.143464	-0.924073	-1.317344	-0.258827	-3.324670	0.103071	-0.581227	0.115401	-0.803539	-1.197759	-1.599040	-3.185047	-2.192910	-1.928019
1980	11906.574	-0.700497	-2.149639	-0.968078	-1.281280	-0.267581	-3.263262	0.018584	-0.618847	0.119079	-0.927318	-1.280509	-1.672232	-3.261181	-2.398824	-2.045414
1981	13682.099	-0.688781	-1.918536	-1.034607	-1.335123	-0.345826	-3.218470	-0.082418	-0.719391	0.121735	-1.084347	-1.391180	-1.800678	-3.056308	-2.350886	-2.194610
1982	14785.206	-0.681489	-1.979072	-1.000581	-1.396263	-0.319092	-3.172462	-0.085891	-0.740936	0.130624	-1.102667	-1.452327	-1.815540	-2.841958	-1.990088	-2.314569
1983	15844.221	-0.680034	-1.749946	-1.100164	-1.475970	-0.420130	-3.289633	-0.144774	-0.845778	0.134520	-1.192470	-1.578946	-1.818379	-2.634548	-1.967673	-2.458039
1984	13245.088	-0.703192	-1.896702	-1.064384	-1.490806	-0.361193	-3.269188	-0.017898	-0.813781	0.159321	-1.100427	-1.501086	-1.629529	-2.640842	-2.045830	-2.392499
1985	16524.977	-0.744436	-1.990575	-1.083571	-1.461505	-0.339134	-3.448526	-0.233465	-1.169264	0.113341	-1.307672	-1.709092	-1.771875	-2.865556	-2.412930	-2.676323
1986	16874.593	-0.798512	-2.021602	-1.147105	-1.412230	-0.348593	-3.387610	-0.230001	-1.158626	0.106895	-1.344709	-1.666663	-1.706373	-2.871339	-2.354770	-2.697468
1987	16161.616	-0.824745	-2.127515	-1.141894	-1.422158	-0.317149	-3.369356	-0.157635	-0.934984	0.107258	-1.302046	-1.574979	-1.584634	-2.766300	-2.242893	-2.610565
1988	18650.364	-0.807915	-2.200264	-1.093587	-1.402190	-0.285672	-3.457430	-0.215175	-1.031468	0.092523	-1.331364	-1.626778	-1.627995	-2.866873	-2.257192	-2.631849
1989	20943.78	-0.849064	-2.331090	-1.106769	-1.379164	-0.257705	-3.444109	-0.241732	-1.024814	0.081452	-1.342137	-1.631907	-1.621861	-3.006967	-2.188323	-2.577649
1990	22744.974	-0.862640	-2.177071	-1.175472	-1.338523	-0.312832	-3.436058	-0.226341	-0.961086	0.084337	-1.368898	-1.583781	-1.576275	-3.062285	-2.169308	-2.439453
1991	26532.02	-0.765945	-1.762488	-1.226638	-1.422549	-0.460692	-3.572049	-0.261288	-1.129031	0.111073	-1.463549	-1.643461	-1.662572	-3.109757	-2.117391	-2.403363
1992	23043.216	-0.686756	-1.700929	-1.137275	-1.605914	-0.450519	-3.637739	-0.122601	-1.165476	0.156335	-1.306347	-1.626953	-1.592156	-2.856663	-1.900552	-2.318011

Date	Y	BKA	RBZA	DMBA	OBIA	DMRB	CIC	TFA	LQL	RBZ	DMB	OBI	NBFI	DFI	PCDMB	PCOBI
1993	21304.413	-0.523628	-1.938478	-0.801969	-1.785551	-0.273342	-3.727919	-0.028141	-1.168148	0.157241	-0.971030	-1.726767	-1.594751	-2.891302	-1.814317	-2.491357
1994	22599.195	-0.498082	-1.888138	-0.784514	-1.744221	-0.286432	-3.755866	0.020225	-1.106906	0.150777	-0.772696	-1.743778	-1.658907	-3.154003	-1.829996	-2.693090
1995	20253.739	-0.519108	-1.954523	-0.790939	-1.592064	-0.271831	-3.656196	0.197513	-0.917663	0.178274	-0.590321	-1.465073	-1.559318	-3.109911	-1.849340	-2.552983
1996	22846.092	-0.534130	-2.079253	-0.774019	-1.549564	-0.239890	-3.728363	0.161751	-0.949204	0.156259	-0.620279	-1.407799	-1.643019	-3.136425	-2.029342	-2.547408
1997	22925.098	-0.494089	-2.097945	-0.718633	-1.590125	-0.224544	-3.580175	0.277012	-0.847130	0.163297	-0.467035	-1.294017	-1.600675	-2.935579	-1.760569	-2.346612
1998	24225.257	-0.407032	-1.703207	-0.726654	-1.867110	-0.319622	-3.564351	0.286322	-0.951489	0.202857	-0.436307	-1.432488	-1.666165	-2.908462	-1.554993	-2.326797

Date	PCBK	PCNBFI	PCDFI	G	OPEN	PCY	LPCY	LGPCY	FSE	CAB	LTECH	FREE	WAR	DMO	CGV	MCGV	COUP	FED
1924	-3.159968		-5.249772	-2.091434	-0.931237	227.28	5.426171	0.152742	0.115486	-0.228148	-1.557091	6.0	0		1	0	0	0
1925	-2.137598		-3.582419	-1.912870	-0.700819	199.49	5.295761	-0.130411	0.004701	-0.273568	-1.572774	6.0	0	0	0	0	0	0
1926	-2.050596		-3.100749	-1.967256	-0.773249	250.15	5.522065	0.226305	0.049809	-0.462708	-1.588214	6.0	0	0	0	0	0	0
1927	-1.998797		-2.941489	-2.001989	-0.787662	309.14	5.733793	0.211727	0.001494	-0.434286	-1.621367	6.0	0	0	1	0	0	0
1928	-1.836087		-2.683340	-1.902247	-0.657196	317.16	5.759401	0.025608	-0.001846	-0.418816	-1.253715	6.0	0	0	0	0	0	0
1929	-1.790968		-2.664600	-1.687367	-0.542596	336.40	5.818292	0.053891	-0.228189	-0.350121	-1.275363	6.0	0	0	0	0	0	0
1930	-1.570141	-3.536994	-2.700444	-1.480228	-0.475225	337.66	5.822046	0.003755	-0.180846	-0.362312	-1.011601	6.0	0	0	0	0	0	0
1931	-1.028945	-2.450991	-2.311150	-1.089617	-0.270480	259.98	5.560621	-0.261426	-0.200596	-0.421248	-1.042923	6.0	0	0	0	0	0	0
1932	-1.087199	-2.455958	-2.372729	-1.192048	-0.546722	296.14	5.690846	0.130225	-0.270353	-0.364087	-1.061257	6.0	0	0	0	0	0	0
1933	-1.243476	-2.556350	-2.510666	-1.446342	-0.802736	334.23	5.811828	0.120983	-0.064428	-0.503773	-1.086877	6.5	0	0	1	0	0	0
1934	-1.337028	-2.673695	-2.597473	-1.233780	-0.847384	424.96	6.051999	0.240170	-0.680080	-0.387624	-1.128171	6.5	0	0	1	0	0	0
1935	-1.360088	-2.651249	-2.722096	-1.288806	-0.863316	463.02	6.137778	0.085779	-0.134220	-0.503437	-0.942348	6.5	0	0	0	0	0	0
1936	-1.361282	-2.579066	-2.929821	-1.610432	-0.896435	476.27	6.165986	0.028208	-0.257910	-0.431984	-0.972293	6.5	0	0	0	0	0	0
1937	-1.421807	-2.599490	-3.083020	-1.593167	-0.851823	527.58	6.268300	0.102314	-0.287437	-0.300069	-0.817575	6.5	0	0	0	0	0	0
1938	-1.471546	-2.602804	-3.199696	-1.613790	-0.799764	574.46	6.353432	0.085132	-0.215843	-0.453548	-0.851574	6.5	0	0	0	0	0	0
1939	-1.666766	-2.794629	-3.491660	-1.779574	-1.091248	767.94	6.643717	0.290284	-0.390171	-0.430391	-0.724092	6.5	1	0	0	0	0	0
1940	-1.652521	-2.769860	-3.544391	-1.679620	-0.987344	770.85	6.647495	0.003779	-0.252407	-0.147114	-0.602265	6.5	1	0	0	0	0	0
1941	-1.699438	-2.841057	-3.706490	-1.557090	-0.870283	804.50	6.690215	0.042720	-0.340531	-0.106390	-0.511492	6.5	1	0	0	0	0	0
1942	-1.711523	-2.797978	-3.799991	-1.392632	-0.751582	765.74	6.640839	-0.049376	-0.229043	0.051357	-0.440189	6.5	1	0	0	0	0	0
1943	-1.769671	-2.741135	-3.887349	-1.329871	-0.674212	717.65	6.575979	-0.064860	-0.129000	0.135051	-0.378436	6.5	1	0	0	0	0	0
1944	-1.689484	-2.678939	-3.969355	-1.121158	-0.610384	702.72	6.554959	-0.021020	-0.297252	-0.070858	-0.328104	6.5	1	0	0	0	0	0
1945	-1.630284	-2.704754	-3.827716	-1.147151	-0.607629	753.23	6.624375	0.069416	-0.133531	0.080043	-0.284600	6.5	1	0	0	0	0	0
1946	-1.593640	-2.800911	-3.910942	-1.307490	-0.641503	847.20	6.741932	0.117557	-0.232112	-0.223144	-0.211649	6.5	0	0	0	0	0	0
1947	-1.434947	-2.850038	-3.879194	-1.474087	-0.722964	938.00	6.843747	0.101815	-0.149036	-0.552069	-0.209721	6.5	0	0	0	0	0	0
1948	-1.366381	-2.850768	-3.662452	-0.884696	-0.754791	988.16	6.895847	0.052101	-0.320599	-0.542324	-0.110348	6.5	0	0	0	0	0	0
1949	-1.250319	-2.810031	-3.293310	-0.843833	-0.777986	1012.50	6.920180	0.024332	-0.480973	-0.810930	-0.044017	6.5	0	0	0	0	0	0
1950	-1.223949	-2.921118	-3.091663	-1.459119	-0.829439	1135.21	7.034577	0.114397	-0.391562	-0.551177	0.100742	6.4	0	0	0	0	0	0
1951	-1.058759	-2.848037	-2.950103	-1.369886	-0.722116	1053.45	6.959829	-0.074748	-0.510826	-0.870828	0.147384	6.4	0	0	0	0	0	0

Date	PCBK	PCNBFI	PCDFI	G	OPEN	PCY	LPCY	LGPCY	FSB	CAB	LTECH	FREE	WAR	DMO	CGV	MCGV	COUP	FED
1952	-1.075025	-2.813059	-2.940458	-1.292771	-0.760268	1106.10	7.008599	0.048770	-0.644357	-0.693147	0.243511	6.4	0		0	0	0	0
1953	-1.097666	-2.708779	-2.880260	-1.107304	-0.635686	1056.67	6.962875	-0.045724	-0.503905	-0.493658	0.380114	6.4	0	2	1	1	0	1
1954	-1.371813	-2.809856	-3.110635	-1.360977	-0.884052	1096.29	6.999689	0.036815	-0.479573	-1.067114	0.569035	6.4	0	2	0	0	0	1
1955	-1.295687	-2.694165	-3.174389	-1.854889	-1.108111	1154.28	7.051236	0.051546	-0.325422	-1.120591	0.639759	6.4	0	2	0	0	0	1
1956	-1.208701	-2.652284	-3.287357	-2.491793	-1.315339	1286.92	7.160010	0.108774	-0.305382	-1.197703	0.777737	6.4	0	2	1	0	0	1
1957	-1.118726	-2.603175	-3.319193	-2.478065	-1.295749	1316.66	7.182850	0.022840	-0.302281	-1.115707	0.875469	6.4	0	2	1	0	0	1
1958	-0.991106	-2.485222	-3.259745	-2.399889	-1.279099	1281.16	7.155524	-0.027326	-0.182322	-1.164426	0.978055	6.4	0	2	1	0	0	1
1959	-0.943008	-2.431655	-3.251169	-2.427244	-1.335905	1288.26	7.161045	0.005521	-0.223144	-0.967584	1.044446	6.4	0	2	0	0	0	1
1960	-0.904562	-2.445075	-3.237083	-2.451000	-1.333251	1325.16	7.189287	0.028243	-0.300105	-0.929111	0.733969	6.4	0	2	0	0	0	1
1961	-0.877613	-2.426450	-3.169653	-2.382960	-1.284159	1296.61	7.167508	-0.021779	-0.389465	-0.780745	0.749466	6.4	0	2	0	0	0	1
1962	-0.876978	-2.406189	-3.108277	-2.350399	-1.214633	1248.78	7.129923	-0.037586	-0.182322	-0.672385	0.763765	6.5	0	3	1	0	0	1
1963	-0.912100	-2.456163	-3.064589	-2.387475	-1.205034	1236.02	7.119648	-0.010274	-0.175891	-0.587787	0.777001	6.5	0	3	0	0	0	1
1964	-0.951151	-2.542645	-3.053355	-2.072743	-0.896150	1237.30	7.120684	0.001036	-0.192904	0.237991	0.781116	6.5	0	3	1	1	0	0
1965	-1.034619	-2.657035	-3.059280	-1.688238	-0.580127	1267.13	7.144506	0.023822	-0.089231	0.298062	0.810683	6.5	0	3	1	0	1	0
1966	-1.067686	-2.681642	-2.976738	-1.428816	-0.593382	1174.31	7.068433	-0.076074	-0.239230	0.103589	0.828297	6.5	0	3	1	0	0	0
1967	-1.161179	-2.827692	-3.045725	-1.469466	-0.855115	1210.25	7.098583	0.030150	-0.143101	0.006924	0.849383	6.5	0	3	0	0	0	0
1968	-1.097526	-2.943277	-3.037179	-1.474499	-0.880015	1215.42	7.102843	0.004260	-0.225550	-0.074145	0.932291	6.5	0	3	0	0	0	0
1969	-1.129998	-3.111792	-3.145103	-1.480435	-0.952316	1355.05	7.211591	0.108748	-0.298493	0.145737	0.937507	6.5	0	3	0	0	0	0
1970	-1.059035	-3.139221	-3.191611	-1.484977	-0.901422	1369.63	7.222295	0.010704	-0.166677	0.096084	0.910625	6.5	0	3	1	0	0	0
1971	-1.027407	-3.250489	-3.268892	-1.591262	-0.946592	1482.66	7.301595	0.079300	-0.222204	0.026892	0.947628	6.5	0	3	0	0	0	0
1972	-1.036133	-3.370691	-3.349564	-1.701909	-0.952351	1586.02	7.368982	0.067387	-0.028285	0.239679	0.987118	6.5	1	3	0	0	0	0
1973	-1.002375	-3.437084	-3.408329	-1.768844	-0.909062	1625.02	7.393276	0.024294	-0.032790	0.231790	1.016111	6.5	1	3	0	0	0	0
1974	-1.021459	-3.584388	-3.485747	-1.782248	-0.906595	1788.79	7.489294	0.096018	-0.093021	0.192235	1.059503	6.5	1	3	0	0	0	0
1975	-0.978975	-3.616682	-3.381698	-1.656316	-0.808189	1731.74	7.456879	-0.032415	-0.034317	0.139978	1.064862	6.5	1	3	0	0	0	0
1976	-0.999078	-3.655736	-3.308841	-1.516924	-0.782736	1680.81	7.427028	-0.029851	-0.091237	0.376032	1.101195	6.5	1	3	0	0	0	0
1977	-0.969739	-3.675963	-3.206538	-1.291381	-0.703138	1515.69	7.323623	-0.103405	-0.157375	0.350109	1.108355	6.5	1	3	0	0	0	0
1978	-1.016707	-3.791788	-3.225372	-1.164485	-0.714751	1465.30	7.289817	-0.033806	-0.336223	0.411639	1.094521	5.5	1	1	1	1	0	0
1979	-1.173143	-4.036495	-3.360854	-1.209667	-0.810929	1563.05	7.354396	0.064579	-0.365961	0.264616	1.095075	4.5	1	1	1	1	0	0
1980	-1.317214	-4.354589	-3.355824	-1.201879	-0.812927	1678.40	7.425597	0.071201	-0.368189	0.116272	1.104142	3.4	0	1	1	1	0	0
1981	-1.338886	-4.642833	-3.083039	-1.264514	-0.839093	1873.75	7.535695	0.110099	-0.142687	-0.046253	1.120913	3.5	0	1	0	0	0	0
1982	-1.205666	-4.783901	-2.888912	-1.186020	-0.820349	1943.38	7.572182	0.036487	-0.218241	-0.110736	1.132046	3.5	0	1	0	0	0	0
1983	-1.243183	-4.955054	-2.881824	-1.152620	-0.829740	2018.12	7.609919	0.037737	-0.108090	0.080159	1.146162	4.5	1	1	0	0	0	0
1984	-1.216727	-4.935077	-2.683333	-1.019622	-0.676095	1634.99	7.399395	-0.210525	-0.224618	0.190726	1.106686	4.5	1	1	0	0	0	0
1985	-1.529312	-5.288444	-2.932436	-1.208981	-0.870296	1970.31	7.585945	0.186551	-0.205911	0.216137	1.084161	4.6	0	1	0	0	0	0
1986	-1.525242	-5.345829	-2.985602	-1.193770	-0.817495	1950.82	7.576005	-0.009940	-0.175687	0.279925	1.085033	4.6	0	1	0	0	0	0
1987	-1.441373	-5.270444	-2.960024	-1.101177	-0.730853	1811.43	7.501874	-0.074131	-0.177661	0.308619	1.136516	5.6	0	1	1	0	0	0
1988	-1.487945	-5.389818	-3.108134	-1.176586	-0.799028	2026.77	7.614200	0.112326	-0.151703	0.372663	1.137476	6.5	0	1	0	0	0	0

Date	PCBK	PCNBFI	PCDFI	G	OPEN	PCY	LPCY	LGPCY	FSB	CAB	LTECH	FREE	WAR	DMO	CGV	MCGV	COUP	FED
1989	-1.459310	-5.411630	-3.222008	-1.234037	-0.854110	2206.70	7.699253	0.085053	-0.172600	-0.050955	0.242861	6.4	0	1	0	0	0	0
1990	-1.410286	-5.270945	-3.284248	-1.238125	-0.862701	2323.52	7.750840	0.051587	-0.139234	-0.067837	0.236437	6.4	0	1	0	0	0	0
1991	-1.383823	-5.402890	-3.342274	-1.362504	-0.916158	2627.97	7.873968	0.123128	-0.026589	-0.290932	0.221558	5.4	0	1	0	0	0	0
1992	-1.212754	-5.363290	-3.106969	-1.244066	-0.790060	2212.93	7.702072	-0.171897	-0.139797	-0.426668	0.198547	5.4	0	1	0	0	0	0
1993	-1.223924	-5.187902	-3.152535	-1.216954	-0.769980	1976.47	7.589070	-0.113002	-0.134361	-0.147251	0.171845	5.5	0	1	0	0	0	0
1994	-1.321275	-5.222405	-3.401757	-1.319750	-0.764050	2026.83	7.614230	0.025160	-0.134092	-0.116498	0.213229	5.5	0	1	0	0	0	0
1995	-1.291192	-5.202199	-3.374120	-1.165358	-0.596567	1757.22	7.471489	-0.142741	-0.163214	-0.227458	0.236416	5.5	0	1	0	0	0	0
1996	-1.402915	-5.398576	-3.453021	-1.193302	-0.693004	1918.55	7.559325	0.087836	-0.220946	-0.148858	0.217417	5.5	0	1	0	0	0	0
1997	-1.173415	-5.491239	-3.282181	-1.128042	-0.626810	1864.74	7.530876	-0.028449	-0.156472	-0.190737	0.198939	5.5	0	1	0	0	0	0
1998	-1.045968	-5.623045	-3.245750	-1.145008	-0.600669	1909.76	7.554731	0.023855	-0.150081	-0.272174	0.180875	5.5	0	1	0	0	0	0

BIBLIOGRAPHY

Adam C. S. and O'Connell S. A. (1997)"Aid, Taxation and Development: Analytical Perspectives on Aid Effectiveness in Sub-Saharan Africa", Centre for Study of African Economies: Working Paper

Akerlof G. (1970) "The Market For Lemons: Quality Uncertainty and the Market Mechanism", *Quarterly Journal of Economics*, 84 (3) pp 488 - 500

Akerlof G. A. (1998) "Men Without Children", *The Economic Journal*, 108, (March) pp 287 – 309

Alesina Ozler, Roubini and Swagel (1996) "Data Set", available at http://www.nuff.ox.uk/Economics/Growth/swagel.htm or http://www.nber.org/pub/swagel/data50.log

Allen F. and Gale D. (1994) "Financial Innovation and Risk Sharing", MIT Press: Cambridge, MA.

Allen F. and Gale D. (1997) "Financial Markets, Intermediaries and Intertemporal Smoothening", *Journal of Political Economy*, Vol. 105, pp 523 - 546

Allen F. and Gale D. (1999) "Comparing Financial Systems", MIT Press: Cambridge, MA.

Allen F. and Santomero A. M. (1997) "The Theory of Financial Intermediation", *Journal of Banking and Finance*, Vol. 21, pp 1461 - 1485

Allen F. and Santomero A. M. (1999) "What Do Financial Intermediaries Do?" The Wharton School Working Paper 99-30-B

Amisano G. and Giannini C. (1997) "Topics in Structural VAR Econometrics," Springer, 2nd Ed

Arrow K. J. (1974) "Insurance, Risk and Resource Allocation" in Lewis M. K. (1995) Ed. "Financial Intermediaries (International Library of Critical Writings in Economics; Vol 43) An Elgar Reference Collection

Askes J. (1971) "The Changing Pattern of Banking in Rhodesia Since 1960", *The Rhodesian Journal of Economics*, Vol. 5 No. 3 (Sept) pp 16 -21

Baltensperger E. (1980) "Alternative Approaches to the Theory of the Baking Firm", *Journal of Monetary Economics*, 6 pp 1-37

Barro R. J. (1997) "Determinants of Economic Growth: A Cross-Country Empirical Study", The Lionel Robbins Lectures, MIT Press, Cambridge, MA

Bartlett A. F. (1987) "Machiavellian Economics", Ashford Press Publishing: UK, 2nd rev. Ed.

Bayoumi T. (1999) "The Morning After: Explaining the Slowdown in Japanese Growth in the 1990s", IMF Working Paper WP/99/13

Beck T, Demirgüç-Kunt A, and Levine R (1999), "A New Database On Financial Development and Structure", World Bank Working Paper.

Beck T., Demirgüç-Kunt A. and Levine R. (2001) "Law, Politics, and Finance", World Bank Working Paper No. 2585

Becsi Z. and Wang P. (1997) "Financial Development and Growth", *Economic Review,* Federal Reserve Bank of Atlanta, Fourth Quarter pp 46 - 62

Benston G. J. and Smith C. W. Jnr. (1976) "A Transaction Approach To the Theory of Financial Intermediation", *Journal of Finance,* XXXI, (2), May, pp 215 - 231

Berger A. N. and Humphrey D. B. (1997) "Efficiency of Financial institutions: International Survey and Directions for Future Research", *European Journal of Operational research:* Special Issue on New Approaches in Evaluating the Performance of Financial Institutions.

Berle A. A. and Means C. G. (1932) "The Modern Corporation and Private Property", Macmillan: N.Y.

Bernanke (1983) "Non-monetary Effects of The Financial Crisis in the Propagation of the Great Depression", *American Economic Review,* Vol. 73 No. 3 (June) pp 257-275

Bhattacharya S. and Thakor A. J. (1993) "Contemporary Banking Theory", *Journal of Financial Intermediation,* 3, pp 2 - 50

Black B., Kraakman R. and Tarassova A. (1999) "Russian Privatisation and Corporate Governance: What Went Wrong?" SSRN Working Paper available at: http://papers.ssrn.com/paper.taf?abstract_id=181348

Black F. and Scholes M. (1973) "The Pricing of Options And Other Corporate Liabilities," *The Journal of Political Economy,* Vol 81 No 3 (May –June)

Bowbrick P. (1988) "Practical Economics for The Real Economist", Graham & Trotman: UK.

Boyd J. and Prescott E. (1986) "Financial Intermediary-coalitions", *Journal of Economic Theory,* 38, pp 211 – 232

Brigham E. F. and Grapenski L. C. (1991) "Financial Management" Prentice Hall

Campbell Committee (1981) "The Final Report of The Commission of Inquiry in into the Australian Financial System", AGPS, Canberra

Central Statistic Office [CSO] (2000) "National Accounts 1985 –1998", Harare Zimbabwe

Chapman R. (1992) "The Zimbabwean Financial Sector: Impediments to efficiency and opportunities for reform," Centre for International Economics —unpublished report.

Chimombe T. (1983) "The Role of Banks And Financial Institutions In The Accumulation And Reinvestment Of Capital In Zimbabwe", University of Zimbabwe: M Phil Thesis.

Claridge M. and Box S. (2000) "Economic Integration, Sovereignty and Identity: New Zealand in the Global Economy, Treasury Working Paper No. 00/22

Clarke L. C. (1986) "Banking Distortions in The Financial Structures of Post-War Economies: (The Experience of Jamaica, Korea, Trinidad and Tobago and the U.S.A.) University of the West Indies PhD Thesis

Coase R. (1937) "The Nature of The Firm", *Economica*, (4) pp 386-405

Cobbing J. (1976) "The Ndebele under the Khumalos 1820-96," University of Lancaster, Ph.D. as cited in Phimister (1988, p16).

Cole R. L. (1973) "The Building Societies And the Housing Market", *The Rhodesian Journal of Economics*, Vol. 7 No. 3 (Sept) pp 139 -148

Cole R. L. (1973) "The Finance Houses in Rhodesia", *The Rhodesian Journal of Economics*, Vol. 7 No. 4 (Dec) pp 207 – 215

Cole R. L. (1973) "The Insurance Industry in Rhodesia", *The Rhodesian Journal of Economics*, Vol. 7 No. 2 (June) pp 59 – 71

Cole R. L. (1974) "Commercial Banking in Rhodesia," *The Rhodesian Journal of Economics* pp 55-65

Cole R. L. (1974) "Pension and Inflation in Rhodesia", *The Rhodesian Journal of Economics*, pp 91 – 97

Cooley T. F. and LeRoy S. F. (1985) "Atheoretical Macroeconometrics: A Critique", *Journal of Monetary Economics*, 16, pp 283-308

Davidson J. (1999) "Econometric Theory", Blackwell Publishers

Davidson R. and MacKinnon J. G. (1993) "Estimation and Inference in Econometrics", Oxford University Press, N Y

Davies J. P. (1997) "Mathematical Encounters of The second Kind", Birkhauser, Boston

De Caires B. and Fletcher D. (1990) "The Guide to Investing in Emerging Securities Markets", *Euromoney*.

De Gregorio & Guidotti (1992) "Financial Development and Economic Growth", International Monetary Fund Working Paper No. 92-101

De Juan A. (1991) "Does Bank Solvency Matter? And What to do About It?" Economic Development Institute of the World Bank [EDI] Working Papers

Delhaise P. (1998) "Asian Crisis: The Implosion of the Banking and Finance Systems", John Wiley & Sons (Asia) (Pvt) Ltd

Demirgüç-Kunt A, and Levine R (1999), "Bank-based and Market-Based Financial Systems: Cross-Country Comparisons", World Bank Working Paper.

Denizer C., Desai R. M. and Gueorguiev N. (1998) "The Political Economy of Financial Repression in Transition Economies", World Bank: Policy Research Working Paper # 2030

Devarajan S., Easterly W. R. and Pack H. (1999) "investment in Africa Too High or Too Low? Macro and Micro Evidence', World Bank Working Paper

Diamond D. and Rajan R. (1998) "Liquidity Risk, Liquidity Creation and Financial Fragility: A Theory of Banking", University of Chicago Working Paper

Diamond D. W. (1984) "Financial Intermediation and Delegated Monitoring", *Review of Economic Studies*, LI (166) pp 393 - 414

Diamond D. W. (1991) "Monitoring and Reputation: The Choice Between Bank Loans and Directly Placed Debt", *Journal of Political Economy*, 99, pp 689 - 721

Diamond D. W. and Dybvig P. H. (1986) "Banking Theory, Deposit Insurance, and Bank Regulation", *Journal of Business*, 59 (1), January, pp 55 – 68

Diebold F. X. (1997) "The Past, Present, and Future of Macroeconomic Forecasting", University of Pennsylvania and NBER Working Paper No. 97-20

Doornik J. A. (1998) "Approximations To The Asymptotic Distributions of Cointegration Tests", in Ed. McAleer and Oxley L. "Practical Issues in Cointegration Analysis", Blackwell Publishers pp 157 - 177

Doornik J. A., Hendry D. F. and Nielsen B. (1998) "Inference In Cointegrating Models: UK M1 Revisited", in Ed. McAleer and Oxley L. "Practical Issues in Cointegration Analysis", Blackwell Publishers pp 117 - 156

Easterly W. (2000) "The Middle Class Consensus and Economic Development", World Bank Working Papers

Easterly W. and Levine R. (2000) "It's Not Factor Accumulation: Stylized Facts and Growth Models", World Bank: Working Paper

Edgeworth F. Y. Esq., M. M.A. (1886) "The Mathematical Theory of Banking", collected in Lewis M. K. (1995) *Financial Intermediaries*, Edward Elgar: UK.

Eichberger J and Harper I. R (1997) "Financial Economics", Oxford University Press.

Enders W. (1995) "Applied Econometric Time Series", Wiley N.Y.

Fama E. and Jensen C. M. (1983a) "Separation of Ownership and Control", *Journal of Law and Economics* (26) pp 301 – 325

Fama E. and Jensen C. M. (1983b) "Agency Problems and Residual Control", *Journal of Law and Economics* (26) pp 327 – 349

Fama E. G. (1980) "Banking in the Theory of Finance", *Journal of Money, Credit, and Banking*, 20 (3), August, part 2, pp 559 –588

Ferson W. E., Sarkissian S. and Simin T. "Spurious Regressions in Financial Economics?" University of Washington Working Paper

Fischer K. P, Gueyie J. and Ortiz E. (1997) "Financial Liberalisation; Commercial Bank's Blessing or Curse?" Canada, CREFA Working paper No. 97-2.

Fisher I. (1933) "The Debt – Deflation Theory of Great Depressions", *Econometrica*, 1, October, pp 337- 357

Fleming J. M. (1962) "Domestic Financial Policies Under Fixed and Floating Exchange Rates", IMF Staff Papers, Vol. 9, pp 369 - 380

Frankel S. H. (1938) "Capital Investment in Africa", Oxford University Press: UK.

Frexias X. and Rochet J. (1997) "Microeconomics of Banking", Cambridge, MA: MIT Press

Friedman M. and Schwartz A. J. (1963) "Money And Business Cycles", *The Review of Economics And Statistics, Supplement*, 45 (1) pp 32-64

Fry M. J. (1997) "In Favour of Financial Liberalisation", *The Economic Journal*, 107 (May) pp 754 - 770

Gans J. S., King S. P. and Mankiw G. N. (1999) "Principles of Microeconomics", Harcourt Brace

Garratt A., Lee K., Pesaran H. M. and Shin Y. (1999) "A Structural Cointegrating VAR Approach to Macroeconomic Modelling", Cambridge University: Working Paper

Gertler M. (1998) "Financial Structure and Aggregate economic Activity: An Overview", *Journal of Money, Credit and Banking*, Vol. 20

Girdlestone J. A. C. (1973) "The Rate of Exchange for the Rhodesian Dollar: Limited Objectives", *Rhodesia Journal of Economics*, (June) pp 81 - 91

Girdlestone J. A. C. (1973) "The Rate of Exchange for the Rhodesian Dollar: Long-term Objectives", *Rhodesia Journal of Economics* (Sept) pp 109 - 121

Goodhart C. (1988) "The Evolution of Central Banks", MIT Cambridge, MA

Government Printers (1981), "Growth With Equity: An Economic Policy Statement."

Government Statistical Bureau (1930) *"Official Yearbook of the Colony of Southern Rhodesia, No. 2"*

Greene W. H. (2000) "Econometric Analysis", 4th Ed. Prentice Hall International

Grossman S. and Hart O. I. (1986) "The Costs And Benefit of Ownership: A Theory of Vertical And Lateral Integration", Journal of Political Economy 94 pp 691 – 719.

Grossman S. J. and Stiglitz J. E. (1980) "On the Impossibility of Informationally Efficient Markets", *American Economic Review*

Gurley J. G. and Shaw E. S. (1956) "Financial Intermediation and the Saving – Investment Process", *Journal of Finance*, XI, pp 257 – 276

Haavelmo T. (1943) "The Statistical Implications of a System of Simultaneous Equations", *Econometrica*, Vol. 11, pp 1 – 12, reprinted in Ed. Hendry D. F. and Morgan M. S. (1995) "The Foundations of Econometric Analysis" Cambridge University Press

Haavelmo T. (1944) "The Probability Approach in Econometrics", Supplement to *Econometrica*, Vol. 12 (selected pages) reprinted in Ed. Hendry D. F. and Morgan M. S. (1995) "The Foundations of Econometric Analysis" Cambridge University Press

Haldrup N. (1998) "An Econometric Analysis of I(2) Variables," in Ed. McAleer and Oxley L. "Practical Issues in Cointegration Analysis", Blackwell Publishers pp 179 – 234

Hamilton J. D. (1994) "Time Series Analysis", Princeton University: New Jersey

Harvey A. (1997) "Trends, Cycles and Autoregressions", *Economic Journal*, 107, pp 192 - 201

Harvey C. (1996) "The Limited Impact of Financial Sector Reforms in Zimbabwe," Institute *of Development Studies,* Working Paper No 36

Hawkins A. M. (1976), "The New Issues Market," *The Rhodesian Journal of Economics*, August p117-127

Hellman J. S., Jones G., Kaufmann D. and Schankerman M. (2000) "Measuring Governance corruption, and State Capture: How Firms and Bureaucrats Shape the Business Environment in Transition Economies", World Bank Working Paper

271

Hixon (1993) "The Triumph of Bankers",

Hoffman D. L. and Rasche R. H. (1997) "A Vector Error-Correction Forecasting Model of the U.S. Economy", Federal Reserve Bank of St Louis – Mimeo.

Holmström B. and Tirole J. (1994) "Financial Intermediation, Loanable Funds and the Real Sector", Working Paper, IDEI, university of Toulouse

Holmström B. and Tirole J. (1997) "Financial Intermediation, Loenable Funds, And The Real Sector", Quarterly Journal of Economics, Vol. CXII, 3, pp 663 - 691

Hoshi T. and Kashyap (1999) "The Japanese Banking Crisis: Where Did It Come From And how Will It End?" NBER Macroeconomic Annual Final Draft

Hussey J. and Hussey R. (1997) "Business Research: A Practical Guide for Undergraduate and Postgraduate Students", Basingstoke: Macmillan

IFC (1982, 1988, 1999) "Emerging Stock Markets Factbook", International Finance Corporation

IMF (2001) "Zimbabwe: Recent Economic Developments, Selected Issues, and Statistical Appendix", IMF Country Report No. 01/13

Jaffee D. (1990) "Levels of Socio-economic Development Theory", Praeger: Westport.

James C. M. and Smith C. W. Jr. Editors, (1994) Studies in Financial Institutions: Commercial Banks, Mc Graw-Hill

Jayaraman T. K. (1996) "Financial Sector in Fiji: Some Empirical Evidence of Financial Deepening", Centre for South Pacific Studies – University of New South Wales.

Jensen C. M. and Meckling H. M. (1976) "Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure", University of Rochester: N.Y.

Johansen S. (1988) "Statistical Analysis of Cointegrating Vectors", Journal of Economics and Control, 12, pp 231-254

Johansen S. (1991) "Estimation and Hypothesis testing of Cointegrating Vectors in Gaussian Vector Autoregressive Models", Econometrica, 59, pp 1551-1580

Johansen S. (1992) "Determination of Cointegration Rank in the Presence of a Linear Trend", Oxford bulletin of Economics and Statistics, 54, pp 383 - 397

Johansen S. (1995) "Likelihood-based Inference in Cointegrated Vector autoregressive Models", Oxford University Press, Oxford

Johansen S. and Juselius K. (1994) "Identification of the Long-run and Short-run Structure: an Application of to the IS-LM Model", *Journal of Econometrics*, 63, pp 7 - 37

Johansen S. and Juselius K. V. (1990) "Maximum Likelihood Estimation and Inference on Cointegration - with application to the demand for money", *Oxford Bulletin of Economics and Statistics*, 52, pp 169-210

Johansen S. and Juselius K. V. (1992) "Testing Structural Hypotheses In A Multivariate Cointegration Analysis of the PPP and UIP for UK", *Journal of Econometrics*, 53, 211-244

Johnson A. C, Johnson B. J. and Buse (1987) "Econometrics: Basic and Applied", Macmillan Publishing.

Judge G. G., Hill C. R., Griffiths W. E., Lütkepohl H. and Lee T. (1988) "Introduction To The Theory and Practice of Econometrics" 2nd Ed., John Wiley and Sons

Kam Hon Chu (1999), "Free Banking And Information Asymmetry", *Journal of Money, Credit, and Banking* Vol. 31 No. 4 (Nov): pp 748 - 762

Kane E. and Rice (2000) "Bank Runs and Banking Policies: Lessons for African Policymakers", National Bureau of Economic Research [NBER] Working Paper 8003 http://www.nber.org/papers/w8003

Kane E. J. (1981) "Accelerating Inflation, Technological Innovation and Decreasing Effectiveness of Bank Regulation", *The Journal of Finance*, Vol. 36 No. 2 (May) pp 355 - 367

Kane E. J. (1983) "Policy Implications of Structural Changes in Financial Markets", *American Economic Review* Vol. 73 No. 2 (May) pp 97 -100

Kane E. J. (2000) "Designing Safety Nets to Suit Country Circumstances", World Bank Research Working Paper

Kanth R. (1994) "Paradigms in Economic Development: Classic Perspectives, Critiques, and Reflections." M. E. Sharpe.

Kashyap A. K., Rajan R and Stein J.C. (1999) "Banks as Liquidity Providers: An Explanation for the Co-existence of Lending and Deposit Taking", Working Paper, *Social Science Research Network [SSRN]*.

Kennedy P (1998) "A Guide To Econometrics", Blackwell Publishers

Keynes J. M. (1891) "The Scope and Method of Political Economy", Macmillan: UK. Extracts reprinted in Ed. Hendry D. F. and Morgan M. S. (1995) "The Foundations of Econometric Analysis" Cambridge University Press

Kindleberger C. P. (1996) "Maniacs, Panics, and Crushes: A History of Financial Crises", John Wiley

Kindleberger C. P. and Herrick B. (1977) " Economic Development", McGraw-Hill Book Company 3rd Ed.

King R. and Levine R. (1992) *"Financial Intermediation and Economic Development"*, in: C. Mayer and X. Vives Eds. Capital Markets and Financial Intermediation, Cambridge University Press, Cambridge.

King R. G. and Levine R. (1992) "Financial Indicators and Growth in a Cross Section of Countries" World Bank Working Paper No. 819

King R. G. and Levine R. (1993) "Finance, Entrepreneurship, and Growth: Theory and Evidence," *Journal of Monetary Economics*, 108 (3), pp 717-738

Koop, G., Pesaran H. M. and Potter M. S. "Impulse Response Analysis in Nonlinear Multivariate Models", *Journal of Econometrics*, 74, p119 - 147

Koopmans T. C., Vining R. and Hastay M. (1947 – 1951) "Measurement without Theory Debate" *Review of Economics and Statistics*, Vol. 29, 1947, Vol. 31, 1949, and *Journal of the American Statistical Association*, Vol 46, 1951, (selected pages) reprinted in Ed. Hendry D. F. and Morgan M. S. (1995) "The Foundations of Econometric Analysis" Cambridge University Press

Krugman P. (1998) "Two Cheers for Formalism", *The Economic Journal*, 108, pp 1829 - 1836

LaPorta R., Lopez-de-Silanes F., Shleifer A. and Vishny (1997) "Legal Determinants of External Finance", *Journal of Finance*, 52, pp 1131 - 1150

LaPorta R., Lopez-de-Silanes F., Shleifer A. and Vishny (1998) *Journal of Political Economy*, 106, pp 1113 - 1155

LaPorta R., Lopez-de-Silanes F., Shleifer A. and Vishny (1999) "Corporate Ownership Around The World", *Journal of Finance*, 54, pp 471 – 517

LaPorta R., Lopez-de-Silanes F., Shleifer A. and Vishny (2000) "Investor Protection and Corporate Governance", *Journal of Financial Economics*, 58, pp 3 – 27

Leamer E. E. (1983) "Let's Take the Con Out of Econometrics", *American Economic Review"*, (March) pp 31 – 43)

Lehr C. and Wang P. (2000) "Dynamic Effects of Financial Intermediation Over the Business Cycle", *Economic Inquiry*, Vol. 38, Issue 1, pp 34 - 57

Leland H. E. and Pyle D. H. (1977) "Information Asymmetries, Financial Structure, and Financial Intermediation", *Journal of Finance*, XXXII, (2) May, pp 371 – 387

Levine R. (1997) "Law, Finance, and Economic Growth," University of Virginia Working Paper

Levine R. (1998) "The Legal Environment, Banks, and Long-Run Economic Growth", *Journal of Money, Credit and Banking* Vol. 3 No. 3, pp 597-613

Levine R. (2000) "Bank-Based or Market-Based Financial Systems: Which is Better? University of Minnesota: Working Paper

Levine R. Loayza N. and Beck T. (2000) "Financial Intermediation And Growth: Causality And Causes" *Journal of Monetary Economics* 46 pp 31 – 77.

Lewis M. K. (1995) Ed. "Financial Intermediaries (International Library of Critical Writings in Economics; Vol 43) An Elgar Reference Collection.

Lorenz E. (1999) "Trust, Contract and Economic Cooperation", *Cambridge Journal of Economics (23)* pp 301-315.

Luintel and Khan (1999) "A Quantitative Reassessment of The Finance-Growth Nexus: Evidence from a multivariate VAR", *Journal of Development Economics*, Vol. 60 pp 381 -405

Lynch D (1993) "Alternative Measures of Financial Development", Macquarie University: CMBF paper No. 5.

Lynch D (1994) "Economic Growth and Financial Sector Development", Macquarie University: CMBF Paper No. 10.

Maital S. (1994) "Executive Economics: Ten Essential Tools for Managers", The Free Press.

Mankiw G. N. (1997) "Macroeconomics", Worth Publishers: N.Y.

Martin P and Win R (1996) "Australia's Financial Markets: Function, Structure and Contribution to the Economy", *SIRCA Research Paper.*

Marx Weber (1930) "The Protestant Ethic and the Spirit Of Capitalism", as cited in Jaffee D. (1990) "Levels of Socio-economic Development Theory", Praeger.

Masih A. M. M. and Masih R. (1999) "Are Asian Stock Market Fluctuations Due Mainly to Intra-regional Contagion effects? Evidence Based on Asian Emerging Stock Markets", then forthcoming in the *Pacific –Basin Finance Journal*

Mason P. (1958) "The Birth of A Dilemma", Greenwood Press, Publishers

Mattesini F. (1993) "Financial Markets, Asymmetric Information And Macroeconomic Equilibrium", Dartmouth

Mayer C. (1988)" New Issues in Corporate Finance", *European Economic Review, Vol. 32.*

McKinnon R. I. (1973) "Money And Capital", The Brookings Institution, Washington DC

Meda S. (1999) "Leadership, Ethics and Disciplinary Codes: the case of Zimbabwe", Asia Pacific Press: National Australia University, Working Paper 99 – 2 available at http://ncdsnet.anu.edu.au

Meredith M (1979, p20) "The Past is Another Country: Rhodesia 1890-1979", Andre Deusch: London.

Merton J. C. (1990) "The Financial System and Economic Performance", printed in "International Competitiveness In Financial Services" – A Special Issue of *The Journal of Financial Services Research*, Vol. 4. No. 4. – Kluwer Academic Publishers

Merton R. C. (1992a) "Financial Innovation and Economic Performance", *Journal of Financial Research*

Mills C. T. (1993) "The Econometric Modelling of Financial Time Series", Cambridge University Press

Mills T. C. (1999) "Great Ratios and Common Cycles: Do They Exist for the U.K.?" Loughborough University: Economic research Paper No. 99/1

Mishkin (1978) F. "The Household Balance Sheet And The Great Depression", *Journal of Economic History*, 38 (4) pp 918 - 37

Mitchell B. R. (1998) "International Historical Statistics: Africa, Asia & Oceania 1750 - 1993

Miwa Y. and Ramseyer M. J. (2000) "Banks And Economic Growth: Implications from Japanese History", Harvard Law School: Discussion Paper No. 289

Mkondo P. T. M. (1992) "Opportunities And Threats facing The Zimbabwean Life Assurance Industry", MBA thesis, University of Keele Staffordshire: UK.

Modigiliani F. (1944) "Liquidity Preference and The Theory of Interest and Money", *Econometrica*, (January) pp 45 – 88

Modigiliani F. and Miller M. H. (1958) "The Cost of Capital, Corporation Finance and the Theory of Investment", *American Economic Review*, 48, pp 261 – 297

Montes F. M. (1998) "The Currency Crisis In South East Asia", The Institute of South East Asian Studies

Mosley P. (1983) "The Settler Economies: Studies in the Economic History of Kenya and Southern Rhodesia 1900-1963", Cambridge University Press.

Mullineux A. W. (1990) "Business Cycles and Financial Crises", Harvester Wheatsheaf, N.Y.

Mundell R. A. (1962) "Capital Mobility and Stabilization Policy Under Fixed and Flexible Exchange Rates", *Canadian Journal of Economic and Political Science*, Vol. 29, pp 475 – 485.

276

Mundell R. A. (1962) "The Appropriate Use of Monetary and Fiscal Policy for Internal and External Stability" IMF Staff Papers, Vol. 9, pp 70 - 79

Myers S. and Rajan R (1998) "The Paradox of Liquidity", *Quarterly Journal of Economics*

Newlyn W. T. and Rowan D. C. (1954) "Money and Banking In British Colonial Africa", Oxford, The Clarendon Press

Owoye O. (1997) "Money And Economic Activity in Developing Countries: Evidence Based on Cointegration and Causality Tests", *American Economist*, Los Angeles (Spring)

Pesaran H. M and Pesaran B. (1997) "Working with Microfit 4.0: "Interactive Econometric Analysis (Windows Version)", Oxford University Press

Pesaran H. M. and Shin Y. (1998) "Generalised Impulse Response Analysis in Linear Multivariate Models", Economic Letters, 58, pp 17-29

Pesaran H. M. and Smith R. P. (1998) "Structural Analysis of Cointegrating VARs" in Ed. McAleer and Oxley L. "Practical Issues in Cointegration Analysis", Blackwell Publishers pp 55 - 89

Phimister I. "An Economic And Social History of Zimbabwe 1890 – 1948: Capital Accumulation And Class Struggle", Longman: N.Y. & London.

Pritchett L. "The Tyranny of Concepts: CUDIE (Cumulated, Depreciated, Investment Effort) is Not Capital

Rajan R. G. and Zingales L. (1998) "The Firm as a Dedicated Hierarchy: A Theory of the Origin and Growth of Firms", Working Paper

Ramakrishnan R. T. S. and Thakor A. V. (1984) "Information Reliability And a Theory of Financial Intermediation", *Review of Economic Studies*, 51, pp 415 - 432

Ramsay D. I. (1976) "Rhodesia's Exchange Rate Policy – And its Consequences", *The Rhodesian Journal of Economics* Vol. 10, No. 4 pp 165 - 176

Rattsø J. and Torvik R. (1998) "Zimbabwean Trade Liberalisation: ex-post evaluation," *Cambridge Journal of Economics* Vol. 22 (3)

Reinsel G. C. (1997) "Elements of Multivariate Time series Analysis", Springer.

Reserve Bank of Zimbabwe (1980) *Quarterly Economic And Statistical Review* (September) (on going)

Rhodesia (1925 –52) *"Official Yearbook of the Colony of Southern Rhodesia"*, Government Statistical Bureau

Rhodesia (1966) *"Economic survey of Rhodesia"*, Ministry of Finance (on going)

Robertson J. C. and Tallman E. W. (1999) "Vector Autoregression: Forecasting and Reality", *Economic Review*, Federal Reserve Bank of Atlanta, first Quarter pp 4-18

Rosnow I. R. and Rosenthal (1996) "Beginning Behavioural Research: a Conceptual Premier", 2nd Ed, Prentice Hall

Roubini N. and Sala-i-Martin X. (1991) "Financial Development, The Trade Regime and Economic Growth", NBER: Working Paper No: 3876.

Roubini N. and Sala-i-Martin X. (1992) "Financial Repression and Economic Growth", *Journal of development Economics*, 39, pp 5 -30

Rousseau P. L. "Finance, Investment, and Growth in Meiji – era Japan", *Japan and The World Economy*, 11, pp 185 -198

Rousseau P. L. and Wachtel P. (1998) "Financial Intermediation and Economic Performance: Historical Evidence from Five Industrialised Countries", *Journal of Money, Credit and Banking* Vol 30 No. 4 pp 657-678.

Runkle (1987) "Vector Autoregressions And Reality", Federal Reserve Bank of Minneapolis, Research Department Staff Report 107

Sandura W. R [Chairman] (1989) "Report of the Commission of Inquiry into the Distribution of Motor Vehicles", Government Printers: Harare.

Santomero M. and Seater J. J., (1998) "Is There an Optimal Size for the Financial Sector?" The Wharton School Working Paper 98-35-B

Sargent T. J. (1999) "The Conquest of American Inflation", Princeton University Press, New Jersey

Scholtens B. and van Wensveen D. (2000) "A Critique On The Theory of Financial Intermediation", *Journal of Banking and Finance*, 24, pp 1243 – 1251

Schuler K. A. (1992) "Currency Boards", George Mason University: Dissertation [available at http://users.erols.com/kurrency/webdiss1.htm]

Schumpeter J. A. (1911, 1936) "The Theory of Economic Development", Harvard University Press: Cambridge MA.

Schumpeter J. A. (1933) "The Common Sense of Econometrics", *Econometrica*, Vol. 1 pp. 5-12, extracts reprinted in Ed. Hendry D. F. and Morgan M. S. (1995) "The Foundations of Econometric Analysis" Cambridge University Press

Schumpeter J. A. (1954) "History of Economic Analysis" New York: Oxford University Press.

Shaw E. S. (1973) "Financial Deepening in Economic Development", Oxford University Press, N Y

Shintani M. (2000) "A Simple Cointegrating Rank Test Without Vector Autoregression", Vanderbilt University Working Paper No. 00 – W44

Shleifer A. and Summers L. (1988) "Break of Trust in Hostile Takeovers" cited in Thakor A. V. (1996) "The Design of Financial Systems: An Overview", *Journal of Banking And Finance,* 20 pp 917 – 948.

Shleifer A. and Vishny W. R. (1997) "A Survey Of Corporate Governance", *Journal of Finance,* Vol. LII No. 2 pp 737 - 783

Siddique M. A. B. (1997) "Economic Development: Then AND Now", University of Western Australia: Discussion Paper 97.05.

Sigh A. (1997) "Financial Liberalisation, Stock Markets and Economic Development", *The Economic Journal,* 107 (May), pp 771 – 782.

Sims C. A. (1980) "Macroeconomics And Reality", *Econometrica,* Vol. 48, Number 1, pp 1 – 48, reprinted in Dale J. P. (1994) Ed. "The Methodology of econometrics Volume II", An Alger Reference Collection

Sims C. A. (1995) "Macroeconomics And Methodology", Working Paper (later appeared in the *Journal of Economic Perspectives*)

Sithole M. (2001) "The Concept of 'Normalising The Abnormal' ", *The Financial Gazette,* 29 March [www.fingaz.co.zw]

Smith L. G. [Chairman] (1989) "General Report of the Committee of Inquiry into the Administration of Parastatals", Government Printers: Harare

Smithson C. W. (1998) "Managing Financial Risk: A Guide to Derivative Products, Financial Engineering, and Value Maximization", McGraw-Hill.

Southern Rhodesia (1947) "Statistical Yearbook of Southern Rhodesia: The Official Handbook of the Social and Economic Conditions of the Colony", Department of Statistics

Spanos A. (1999) "Probability Theory and Statistical Inference: Econometric Modelling with Observational Data", Cambridge University Press: UK.

Spanos, Andreou, and Syrichas (1997) "The Vector Autoregression (VAR) Approach To Econometric Modelling: Volume 1 A VAR Model For The Monetary Sector of The Cyprus Economy", University of Cyprus and Central Bank of Cyprus

Spulber D. F. (1999)"Market Microstructure: Intermediaries and The Theory of The Firm", Cambridge University Press

St Thomas Aquinas (c. 1260, 1994) "On The Governance of Rulers" as cited in Rick D. Z. "The Economic Theory of Growth and Development, p6.

Standard Bank (1967) "1892-1967 Three Quarters Of A Century: of banking in Rhodesia."

Stiglitz J. (1989) "Markets, Market Failures, and Development", *American Economic Review*, Vol. 79 NO. 2 (May) pp 197-203

Stiglitz J. and Weiss (1981) "Credit Rationing in Markets With Imperfect Information", *American Economic Review*, 71, pp 393 - 410

Stiglitz J. E. and Weiss A. (1990) "Banks as Social Accountants and Screening Devices for the Allocation of Credit", *Greek Economic Review*, 12, Supplement, Autumn, pp 85 - 118

Stock J. H. (1994) "Unit Roots, Structural Breaks and Trends", in: Engle R. F. and McFadden D. L. Eds. *Handbook of Econometrics*, Elsevier Science B. V, pp 2739-2841

Sudweeks B. L. (1989) "Equity Market Development in Developing Countries," Praeger N.Y. Westport

Summers C. (1994) "From Civilisation To Segregation: Social Ideas and Social Control in Southern Rhodesia, 1890 – 1934" Ohio University Press, Athens.

Summers L. H. (1985) "On Economics And Finance", *The Journal of Finance*, Vol. XL. No. 3 pp 633 – 635

Summers L. H. (1991) "The Scientific Illusion in Empirical Macroeconomics", *Scandinavian Journal of Economics*, 93 (2) pp 129 - 148

Sylvester C. (1991) "The Terrain of Contradictory Development", Westview Press, Dartmouth: UK.

Taylor L. D. (2000) "Capital, Accumulation, And Money: An Integration Of Capital, Growth, And Monetary Theory", Kluwer Academic Publishers

Thakor A. V. (1996) "The Design of Financial Systems: An Overview", *Journal of Banking And Finance*, 20 pp 917 – 948.

The Federal Reserve Bank of Cleveland (1995) "Governments and Money" essay on http//www.clev.frb.org/annual/essay.htm

The World Bank (1989) "World Development Report 1989: Financial Systems and Development", *World Development Indicators*, Oxford University Press.

Tobin J. (1963) "Commercial Banks As Creators of Money", *Banking and Monetary Studies*, reprinted in Lewis M. K. (1995) "Financial Intermediaries." An Elgar Reference Collection

Tobin J. (1965) "Money and Economic Growth," *Econometrica* Vol. 33 No. 14

Todaro M. P. (1997) "Economic Development", Addison Wesley Longman Limited, 7th Ed.

Van Home J. C. (1985) "Of Financial Innovations and Excesses", *Journal of Finance* (July) pp 621 - 631

Watson M. W. (1994) "Vector Autoregression And Cointegration", in: Engle R. F. and McFadden D. L. Eds. *Handbook of Econometrics,* Elsevier Science B. V, p2843-2915

Weintraub R. E. (1998) "Controversy: Axiomatisches Mibverstandnis", *The Journal of Economics,* 108, pp 1837 - 1847

Williamson E. O. (1988) "Corporate Finance And Corporate Governance", *Journal of Finance,* Vol XLIII No. 1 pp 567-591

Yule G. U. (1926) "Why Do We Sometimes Get Nonsense Correlations between Time-Series?" *Journal of the royal Society,* Vol. 89 pp 2-9, 30-41, reprinted in Ed. Hendry D. F. and Morgan M. S. (1995) "The Foundations of Econometric Analysis" Cambridge University Press

Zimbabwe (1980) *"Monthly Digest of Statistics",* Central Statistics Office

Zingales (1997) "Corporate Governance", then forthcoming in *The Palgrave Dictionary of Economics and Law:* Chicago, US.

Zingales L. (2000) "In Search of New Foundations", Social Scientists Research Network [SSRN] Working Paper

ZSE (2000/1) "The Investors' and Financial Markets Handbook", Zimbabwe Stock Exchange

REFERENCES

[1] *The Federal Reserve Bank of Cleveland (1995)* "Governments and Money" essay on http//www.clev.frb.org/annual/essay.htm

[2] See Mullineux A. W. (1990) "Business Cycles and Financial Crises", Harvester Wheatsheaf, NY

[3] Shleifer A. and Summers L. (1988) "Break of Trust in Hostile Takeovers" cited in Thakor A. V. (1996) "The Design of Financial Systems: An Overview", *Journal of Banking And Finance,* 20 pp 917 – 948.

[4] As cited in Shleifer A. and Vishny W. R. (1997) "A Survey Of Corporate Governance", *Journal of Finance 2 (June).*

[5] *The Daily News* 23 March 2001 [http://www.dailynews.co.zw/daily/]

[6] *The Zimbabwe Standard* 10 December 2000. [http://site.mweb.co.zw/standard/]

[7] *The Financial Gazette* 1 February 2001. [http://www.fingaz.co.zw]

[8] *The Daily News* 15 December 2000 [http://www.dailynews.co.zw/daily/]

[9] Cited in Jaffee D. (1990, p104) "Levels of Socio-economic Development Theory", Praeger: Westport

[10] Marx Weber (1930) "The Protestant Ethic and the Spirit Of Capitalism", as cited in Jaffee D. (1990) "Levels of Socio-economic Development Theory", Praeger.

[11] Cited in Jaffee D. (1990) "Levels of Socio-economic Development Theory", Praeger: Westport, p108.

[12] Mason P. (1958,p25) The Birth of a Dilemma

[13] Government Statistical Bureau (1930) *"Official Yearbook of the Colony of Southern Rhodesia, No. 2"*

[14] *Zimbabwe Independent* 5 January 2001 [http://www.mweb.co.zw/zimin]

[15] Cobbing J. (1976) "The Ndebele under the Khumalos 1820-96," University of Lancaster, Ph.D. as cited in Phimister (1988, p16).

[16] *Zimbabwe Independent* 5 January 2001 [http://www.mweb.co.zw/zimin]

[17] St Thomas Aquinas (c. 1260, 1994) "On The Governance of Rulers" as cited in Rick D. Z. "The Economic Theory of Growth and Development, p6.

[18] *Financial Gazette* 22 March 2001 [http://www.fingaz.co.zw]

[19] Goodhart (1988, p17)

[20] Standard Bank (1967) "1892-1967 Three Quarters Of A Century: of banking in Rhodesia."

[21] Government Statistical Bureau (1930) "Official Year Book of The Colony of Southern Rhodesia", No. 2 - 1930

[22] Reserve Bank of Zimbabwe (1980) *Quarterly Economic And Statistical Review* (September)

[23] For complete details on these variables see Alesina, Ozler, Roubini and Swagel (1996) data set available at http://www.nuff.ox.ac.uk/Economics/Growth/swagel.html or http://www.nber.org/pub/swagel/data50.log For the purposes of this research, the Zimbabwe data set was extended by the author on the basis of historical knowledge.

[24] Koopmans T. C., Vining R. and Hastay M. (1947 – 1951) "Measurement without Theory Debate" *Review of Economics and Statistics*, Vol. 29, 1947, Vol. 31, 1949, and *Journal of the American Statistical Association*, Vol 46, 1951, (selected pages) reprinted in Ed. Hendry D. F. and Morgan M. S. (1995) "The Foundations of Econometric Analysis" Cambridge University Press

[25] As cited in Freixas and Rochet (1998) "Microeconomics of Banking", MIT Press, Cambridge, Massachusetts

[26] Governor, Reserve Bank of Zimbabwe, *Quarterly Economic and Statistical Review*, Sept 1980.