The Determinants of Corporate Financial Policy in Zimbabwe;

Empirical evidence from company panel data

By

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Abstract

This thesis examines the patterns and determinants of corporate financial policy (capital structure and dividend policy) in Zimbabwe. In particular it investigates various aspects of corporate financial behaviour in an emerging market; the evolution of corporate financial structure and dividend payout ratio over the past 25 years (1975-1999), the impact of the reform programme (introduced in 1992) on firm characteristics, the corporate financing patterns during the period 1990-1999, the determinants of corporate capital structures and dividend policy and the interaction between corporate financing and dividend policy decisions.

The main results that emerge from the analysis suggest that (i) the debt ratio for the Zimbabwean corporate sector significantly increased after the reform (ii) the Zimbabwean corporate sector mainly depends on external finance (75 % of total financing) especially short-term finance, which contributes 52 % of total financing.

Furthermore, the results support the following hypotheses (i) the pecking order hypothesis that firms prefer internal financing to external financing, (ii) the trade-off hypothesis that non-debt tax shields reduce the expected gains from leverage, (iii) firms use liquid assets to finance investments, (iv) the agency cost hypothesis that increasing managerial ownership helps to align the interests of managers and shareholders and therefore reduces the role of debt as an agency-conflict mitigating factor, (v) large firms have lower bankruptcy costs and therefore can support more debt than smaller firms, (vi) debt service limits the amount of cash paid out as dividends, and (vii) high growth firms rely on external finance more than low growth firms (viii) high growth and firms have low payout ratios (iv) Cash flows and institutional investors increase the likelihood that firms will pay dividends (v) capital structure and dividend policy decisions are interdependent and highly leveraged firms have low payout ratios

KEY words, Zimbabwe, financial policy, capital structure, dividend policy, firm characteristics, Corporate.

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Chapter 1-Introduction and macroeconomic overview

The fear of the Lord is the beginning of wisdom. Proverbs 9:10

1.1 Introduction

This thesis examines the pattern and determinants of corporate financial policy (capital structure and dividend policy decisions) made by Zimbabwean non-financial firms listed on the Zimbabwe Stock Exchange.

The determinants of corporate financial policy have long been the focus of controvesy in the finance literature. Modigliani and Miller (1958) and Miller and Modigliani (1961), under restrictive assumptions, have demonstrated that the value of the firm is independent of its capital structure and dividend policy. However, the recent theoretical literature tends to suggest that once the assumption of perfect market conditions is relaxed, taxation, agency costs and asymmetric information play important roles in determining corporate financial policy.

There have been many studies that have sought to empirically identify the major determinants of corporate financial policy. However, most of our understanding of corporate financial policy decisions is based on evidence from practices of firms operating in developed markets (see, Harris and Raviv, 1991 and Michaely and Allen, 1995). However, in general, the institutional environment in which these firms operate is different from that of emerging markets. For example, the capital markets in developed countries are characterised by large stock markets which are efficient, and to a large extent provide the main market for corporate control. The banking sector is large and well developed. Furthermore, the fiscal policies of developed countries do not significantly change over a relatively short period of time and more importantly the firms in developed countries are large and well diversified.

On the other hand, the emerging capital markets, particularily in the Sub-Sahara region are small, thin and inefficient. Therefore the factors that have been suggested in the literature to shape corporate financial policy decisions in developed countries may not have explanatory power in emerging markets. Therefore, a study that examines corporate financial practices of firms in emerging markets may help to validate the relevance of the variables suggested in the theoretical literature. Since less is known about the basics of financial practices of corporations in emerging markets, the present study, by examining corporate financial policy in Zimbabwe, is an attempt to fill this gap in our research knowledge.

Zimbabwe is of interest for several reasons. First and most basic, Zimbabwe is one of relatively few sub-Saharan African countries with an established corporate sector and a company accounts database which is long-established and of good quality. Second, Zimbabwe was included in the sample of countries originally considered by Singh and Hamid (1992) and by Booth *et al* (2001), and further results for Zimbabwe therefore offer an interesting perspective on and development of previous research. Third, the Zimbabwean corporate sector has evolved through three major and dramatically-different economic regimes: the Unilateral Declaration of Independence (UDI) period (1965-1979), the first decade of independence (1980-1990) and the Economic Structural Adjustment Programme (ESAP) period that started in December 1991. During the UDI period, international sanctions were imposed on Zimbabwe, forcing the government to adopt an import substitution industrialisation policy. At that time, the only source of external finance for the corporate sector was the domestic financial system. During the first decade of independence the economy was heavily controlled and by the late 1980s there were serious problems of high unemployment levels, inflation rates and a growing budget deficit. As an attempt to address these economic problems, the government adopted an economic reform programme in 1991 with the aim of raising savings, investment and economic growth. Thus Zimbabwe has evolved through three very different economic policy regimes and it offers a

particularly interesting setting within which to examine questions about economic policy, financial sector growth and company financial behaviour.

The thesis is empirical and is divided into eight chapters. The second section of chapter one briefly describes the macroeconomic environment in Zimbabwe from 1965 to 1999. In the same section we also explore the development of the banking sector and stock market. We argue that the corporate financial policies of the Zimbabwe corporate sector must have been shaped by the changes in the institutional environment. Some of the hypotheses that will be tested in the later empirical chapters are drawn from the discussion in this section.

In chapter two we survey the theoretical and empirical literature on corporate financial policy. The first section of the chapter focuses on four conditions under which capital structure decisions matter, namely; the trade-off (taxation and bankruptcy costs), agency costs, asymmetric information and corporate strategy hypotheses. The second section reviews the literature on the determinants of dividend policy while the third section surveys the literature on the interaction of capital structure and dividend policy decisions. From the literature survey, we will draw hypotheses about corporate financial policy, which will be tested in the empirical chapters of the thesis.

Chapter three describes the data set, variables and the methodology employed to empirically examine financial practices of the Zimbabwean corporate sector. The first section of the chapter describes the characteristics of the sample of firms. The second section presents the definitions of the variables selected for the empirical applications and the third section introduces and justifies the methodology employed in the subsequent empirical chapters.

Chapter four explores the characteristics of non-financial firms listed on the Zimbabwe Stock exchange and is divided into four sections. The first section discusses the pattern of corporate boards, share ownership structure and ownership concentration. Due to data unavailability, this analysis is restricted to the period 1990 to 1999. Using descriptive statistics methodology (paired t-test and Wilcoxon test),

the second section of the chapter compares capital structure ratios and firm performance across the three regimes. The third section examines financing patterns of the Zimbabwean corporate sector. This analysis is also restricted to the period 1990 to 1999 due to data unavailability prior to 1990. The last section of the chapter summarises the main findings.

In chapter five we look at the empirical determinants of corporate capital structure decisions. The empirical analysis is carried out in a three-step procedure. In the first section we examine the capital structure decisions of 32 firms over the period 1975 to 1999. Using the F-test (Chow test), we investigate whether there is a structural shift in parameters (intercept and slope coefficients) of the capital structure equation as a result of changes in government policy regimes. We use the regime interaction dummies to detect, which individual parameters have changed. This methodology allows for differential intercepts and slope parameters. Furthermore, we use recent developments in the econometric literature about panel data estimation to model the capital structures of firms over the period 1975 to 1999. The second section examines the influence of agency factors on capital structures of 51 firms over a short period of time (1995-1999). Both static and dynamic models are estimated. We also attempt to address the issue of different definitions of leverage. The third section disaggregates the data into holding and non-holding firms and compares the financial performances and capital structures of these two groups of firms. Finally the fourth section summaries the main findings of the empirical analysis.

Chapter 6 examines the dividend practices of the Zimbabwean corporate sector. The first section of the chapter documents the historical pattern and evolution of dividends for the Zimbabwean corporate sector over the period 1975 to 1999. Section two presents econometric evidence on dividend behaviour and is done in four steps. First, in order to test for dividend stability, the Lintner (1956) model of corporate dividend behaviour is estimated using recent developments in the econometric literature about dynamic panel data estimation. Second, we investigate the major determinants of the payout ratio, drawing the variables from the previous empirical literature. Third, we investigate the determinants of the decision to pay and omit dividends. Fourth, we investigate the determinants of the decision to increase, maintain and reduce dividends. The fourth section of the chapter presents the main findings and concludes.

In chapter seven we look at the interaction between capital structure and dividend policy decisions. The first section of the chapter empirically investigates the extent to which capital structure and dividend policy decisions are interdependent and the second section summaries the main findings.

Finally, chapter eight summaries the main findings of the thesis, highlights the shortcomings of the study and suggests potential future research in corporate financial policy decisions.

1.2 Macroeconomic Environment

Prior to the UDI in 1965, Zimbabwe had a strong trade link with Britain and therefore the main objective of the economic sanctions was to cut off this relationship. This would deprive the government of the foreign currency on which much of the economy has heavily dependent. The impact of the sanctions on the economy was significantly felt in 1966 when GDP growth rate dropped to –4 % as compared to 7.1 % in 1965. However, this low growth rate did not persist because the government intervened. There was a shift from external market oriented policy to import-substitution industrialisation strategy. Firms were forced to reinvest profits, diversify their product lines and lend their surpluses to other local firms whose productions and activities were in line with the regime's import substitution guidelines. Loans, through the state owned bank (Rhobank) and subsidies were also provided to these firms. Commercial Banks were also forced to increase domestic assets and re-invest in the country. This further developed the commercial banks' interests in secondary financial institutions such as Finance Houses. In time, alternative routes for the country's exports and imports were found through Mozambique and South Africa. Therefore, although the aim of the sanctions was to ruin the Zimbabwean economy (and corporate sector), it actually "brought about a restructuring of the country's foreign trade, caused a broadening of the economic base, and led to a large degree of local autonomy and independence for local financial and commercial institutions", Price Waterhouse p.8.

After attaining independence in 1980, the new government had a major task of redressing the historical inequalities in terms of education, land, wages and salaries. The main aim of the new regime was poverty reduction and it therefore introduced free education and health for the poor. Basic commodities were heavily subsidised in order for them to be affordable by the poor. Wages and salaries, foreign exchange, dividend repatriation and new investments were also heavily controlled. The highly regulated economy saw the annual GDP growth rate drop to 2.7 % during the 1980-89 period. By 1989, total public sector debt was 90 % of GDP, of which 36 % was external. Inflation and nominal interest rates averaged 15 % and 12 % respectively and hence real interest rates were negative. Unemployment rate reached a record level of 26% in 1989. The main cause of the low growth rate was the low level of private investment (which was less than 8% of GDP in 1987) in the productive sectors of the economy. In turn, the decline in investment was attributable to a heavily regulated business environment through price controls, labour market restrictions, investment control procedures and the high costs associated with the foreign exchange allocation system.

In order to address these problems, the government in 1991 introduced the Economic Structural Adjustment Programme (ESAP), with the aim of transforming the economy by moving away from a highly regulated economy to a free market one.

The key areas of the reform programme were the following. First, trade liberalisation, especially moving away from the system of foreign exchange allocation to a market based one. Second, prices, wages and salaries were decontrolled in order to allow more flexibility in price and wage setting. In addition, regulations on investments and production were also relaxed in order to facilitate new entry and exit of enterprises. Third, the fiscal deficit at 13.1 % of GDP in the 1988/89 fiscal year was to be reduced to 5 % by 1994/95. Fourth, interest rates were left to be determined by the market and restrictions on entry and exit of new banks and other financial institutions, both domestic and foreign, were also relaxed. This approach was meant to promote the efficiency of the financial sector and consequently stimulate the growth of the corporate sector.

Did the corporate sector welcome the proposed reform? Although this question might be beyond the present study, it is interesting to know whether the intentions of the

reform programme were meant to benefit the corporate sector. A survey of chairman's statements soon after the implementation of the reform shows that the corporate sector welcomed the relaxation of both trade and foreign exchange controls (see Box 1 below).

Box 1. Chairpersons' statements about Economic structural adjustment programme

1. "The recently announced import liberalisation and restructuring programme has created an atmosphere of cautious optimism and against this background, your group is committed to its expansion plans, in line with the government's stated objectives," *Truworths* 1991.

2. " ESAP will alleviate some of the constraints.....this initiative which should ensure an improvement in the country's economic performance, promotion of trade, increased competition, and employment opportunities," *PG*, 1991

3. "In the last few months, the economic environment has changed dramatically and with the welcome decision by the Zimbabwean Government to introduce ESAP," *APEX*, 1992.
4. "Although one of ESAP's central philosophies is for companies to export more.....we now have the ability to finance our exports on an offshore basis, i.e., interest charged on exports will be considerably reduced," *SPINNERS*, 1992.

5. "The deregulation and relaxing of exchange control regulation are very encouraging. ..... I believe our structural adjustment programme has arguably worked better and more swiftly than in any other country in Africa," *TSL*, 1993.

6. "The relaxing of trading constraints under the recently announced economic measures will encourage a more open and competitive market..... company has to face these challenges and develop brands accordingly. ESAP has provided an environment which is conducive for the exports of Mazoe products," *Schweepes*, 1993.

7. "The relaxation in exchange control regulation, announced on 1 January 1994 has had a major impact on our ability to conduct business efficiently with far less time being wasted on bureaucracy. This is most welcome...," *ZimAlloys*, 1994.

1.2.1 An Overview of the Financial System in Zimbabwe.

In this section the development of the financial system, from 1975 to 1999, is explored using indicators of banking system and stock market development as suggested by Prowse (1995) and Levine and Zervos (1996), among others. As discussed above this period covers the three episodes of major policy changes

The role of the financial system as a source of external corporate finance cannot be overemphasised. In theory, a well-developed financial system is expected to be capable of meeting most of the short-term, medium-term and long-term financial needs of corporations. However, financial sectors in most developing countries are underdeveloped such that corporate financing choice is limited. In an effort to boost savings and investments, governments of such economies have recently embarked on financial liberalisation programmes and this change in policy is expected to have an important impact on corporate financial behaviour.

In this section, we fist examine the evolution of the Zimbabwean financial system. The evolution of the political economy of Zimbabwe has an important influence on the banking structure and the role the financial sector plays in financing industry. During the Unilateral Declaration of Independence (UDI) period, foreign-owned banks and multinational corporations played a major role in transforming the Zimbabwean financial system into what has been considered to be a sophisticated financial system, by African standards. During the UDI era, the financial system comprised the central bank, 4 commercial banks, 4 merchant banks, 2 Discount houses, 5 Finance Houses, 3 Building societies and a stock exchange. The government also set up a Post Office Savings Bank and an Agriculture Finance Corporation to cater for the small savers and financial needs of the agricultural sector, respectively. A stock market had long been established in 1946 to cater for the mining sector's activities. During UDI, foreign capital inflow was inhibited because of the economic sanctions. In this case, domestic institutional investors played a major role in the buying and selling of securities on the stock exchange. It is important to note that, this banking sector was serving a small corporate sector dominated by multinationals. After all, the level of investment was low since it depended on the availability of foreign currency. Therefore, it could be argued that, the financial sector was capable of meeting the financing requirements of the corporate sector. This banking structure, characterised by lack of competition and innovation, was inherited by the current government, which came into power in 1980. In 1980, the new government helped to establish the fifth commercial bank with a 47 % shareholding. Another discount house and two more merchant banks were also established. Several specialised institutions were also established to direct funds to specific sectors such as agriculture, industry

and mining[1]. Development banking institutions were set up to meet the medium and long term financial needs of the corporate sector. Of great importance, was the establishment of the Zimbabwe Development Bank in 1983. The bank offers a comprehensive package of financial services, which include long term loans, equity finance, lease finance, hire purchase factoring, trade finance and working capital. A similar institution (Small Scale Development Corporation) was also established in 1984 to cater for the historically neglected small-scale enterprise sector. However, from 1980 to 1990, the financial sector was heavily regulated. The monetary authorities made use of interest rate and credit ceilings to control and direct spending. There were also restrictions on entry of new banks and participation of foreigners on the stock market. Financial repression resulted in negative real interest rates, which discouraged savings. The other shortcoming of the Zimbabwean financial sector was the collusive behaviour of commercial banks. Credit was only given to well-established corporations with good track record and assets to use as collateral. Restrictions on participation of foreigners on the stock market also limited foreign capital inflows.

As mentioned above, in 1991, the government implemented the economic structural adjustment program, which included a financial reform package. The main elements of the financial reform included deregulation of the interest rates, moving towards market operations and opening up of the financial sector to new entrants, both local and foreign. The current banking structure, (post reform period) comprises a central bank, 9 commercial banks, 7 discount houses, 8 Merchant banks 5 building societies, 7 finance houses, 5 development institutions and a stock exchange. There are thousands of registered pension funds and several insurance, assurance and asset management companies. Most recently, unit trusts have flooded the market. These unit trusts are important in the sense that they enable small investors to participate on the securities market. In Zimbabwe, the unit trusts can generally be classified into either equity funds or income funds. General equity funds can further be classified as general equity funds, specialist equity funds or balanced funds. General equity funds invest in a wide range of sectors and securities listed on the Zimbabwe Stock Exchange. On the other hand, specialist equity funds invest in particular shares of

[1] These were, Agricultural finance Corporation, Industrial Development Corporation and Mining Development Corporation.

companies listed on the Zimbabwe Stock Exchange, which implies that they are less diversified. Balanced funds invest in a broader spectrum of assets, such as shares, listed property, gilts and fixed interest securities. To safeguard the interests of investors, the Collective Investment Scheme Act governs the unit trusts and an association was formed in June 1995 in an attempt to co-ordinate and develop the operations. These developments should, therefore, increase the amount of external finance available to corporations.

The other objective of the financial reform program was to improve financial intermediation, savings and investments by allowing competition among banks. The Zimbabwean financial system is slowly moving towards the UK system, whereby banks offer an increasing range of financial services. In this case, financial liberalisation is expected to improve the amount of credit available to the corporate sector as crowding out, often associated with financial repression, is eliminated. However, it is necessary at this juncture to assess the impact of the financial liberalisation program on the development of the financial system. In this case, we focus on the development of the banking system and the stock market. We make use of the ratio of bank's liquid liabilities to GDP and ratio of bank assets to GDP, as suggested by Demirguc-Kunt and Maksimovic (1996), to explore the banking system's response to the implementation of the financial reform program. The first ratio measures the size of the formal financial system relative to the economy as a whole. We also use a third indicator, the value of loans and advances to the private sector by financial institutions as a percentage of total value of their assets. This ratio measures the importance of the deposit taking institutions in financing industry.

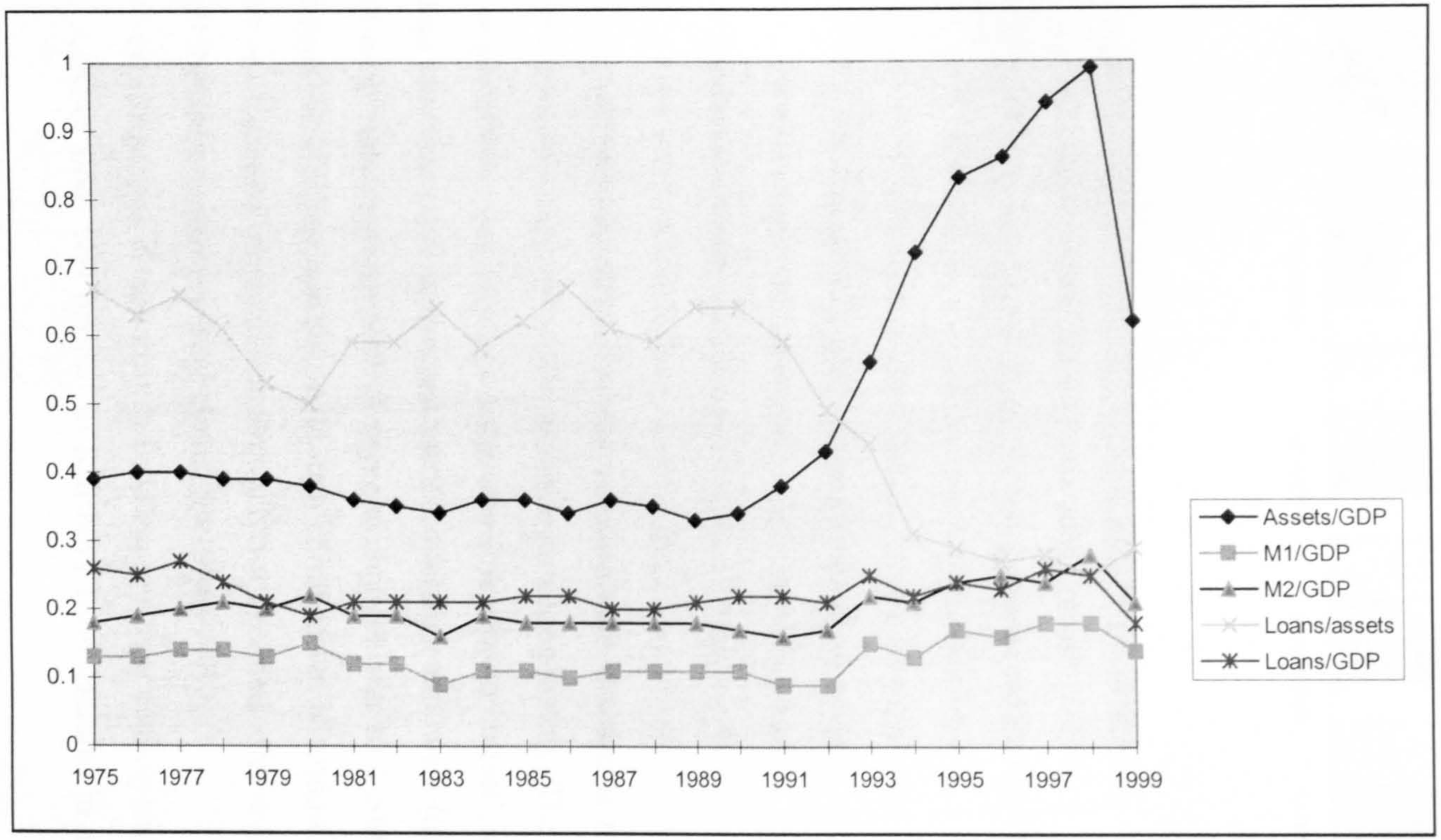
On the other hand, the most commonly used measures of stock market development are: the ratio of gross issuance of public equity to GDP, (Prowse, 1995), new share issues as a percentage of gross fixed capital formation, (see, Kitchen, 1987), the ratio of market capitalisation to GDP and the value of trades as a percentage of GDP.[2] We used data obtained from Quarterly Economic and Statistical Review (various years) published by the Reserve Bank of Zimbabwe, to compute these ratios

[2] Levine and Zervos discuss indicators of banking system and stock market development in detail.

1.2.1.1 Developments in the banking system

The indicators of banking sector development are shown in figures 1.1 and 1.2 below. Figure 1.1 shows the evolution of the banking sector development ratios from 1975-1999, while figure 1.2 shows the averages of each of these ratios during each regime. The ratio of the bank's liquid liabilities to GDP for mature banking systems is often greater than one. For the Zimbabwean case, the ratio of m2 to GDP is less than 0,30 from 1975 to 1999. The m2/GDP ratio was slightly above 20 % from 1975 to 1980 and rose again in the post reform period to a maximum of 28 % in 1998. This is partially explained by emergence of a host of new financial institutions. The bank assets/GDP and the claims on private sector/GDP ratios also show similar patterns. The lowest levels for these ratios were recorded in the 1980s. The most remarkable feature of the results is the movement of the bank assets/GDP ratio. In the 1970s it averaged 39 %, dropped to an average of 33 % in the 1980s and then rose to an average of 88% in the late 1990s. The results also show that the value of loans and advances to the private sector provided by financial institutions as a percentage of their total assets, has been declining for the past 20 years. This might be due to the fact that the banking sector is increasingly channelling financial resources to the public sector. We also computed the relative shares of the different financial institutions in providing loans to the corporate sector. The major observation is that commercial banks contributed the most (20 %) to the financing of the corporate sector. The second observation is that there was a sharp drop in the contribution of Building societies from 19 % in 1975 to 6 % in 1999. We can therefore, conclude that the Zimbabwean banking sector is narrowly based and dominated by commercial banks, which by their nature are reluctant to engage in long term lending to the corporate sector.

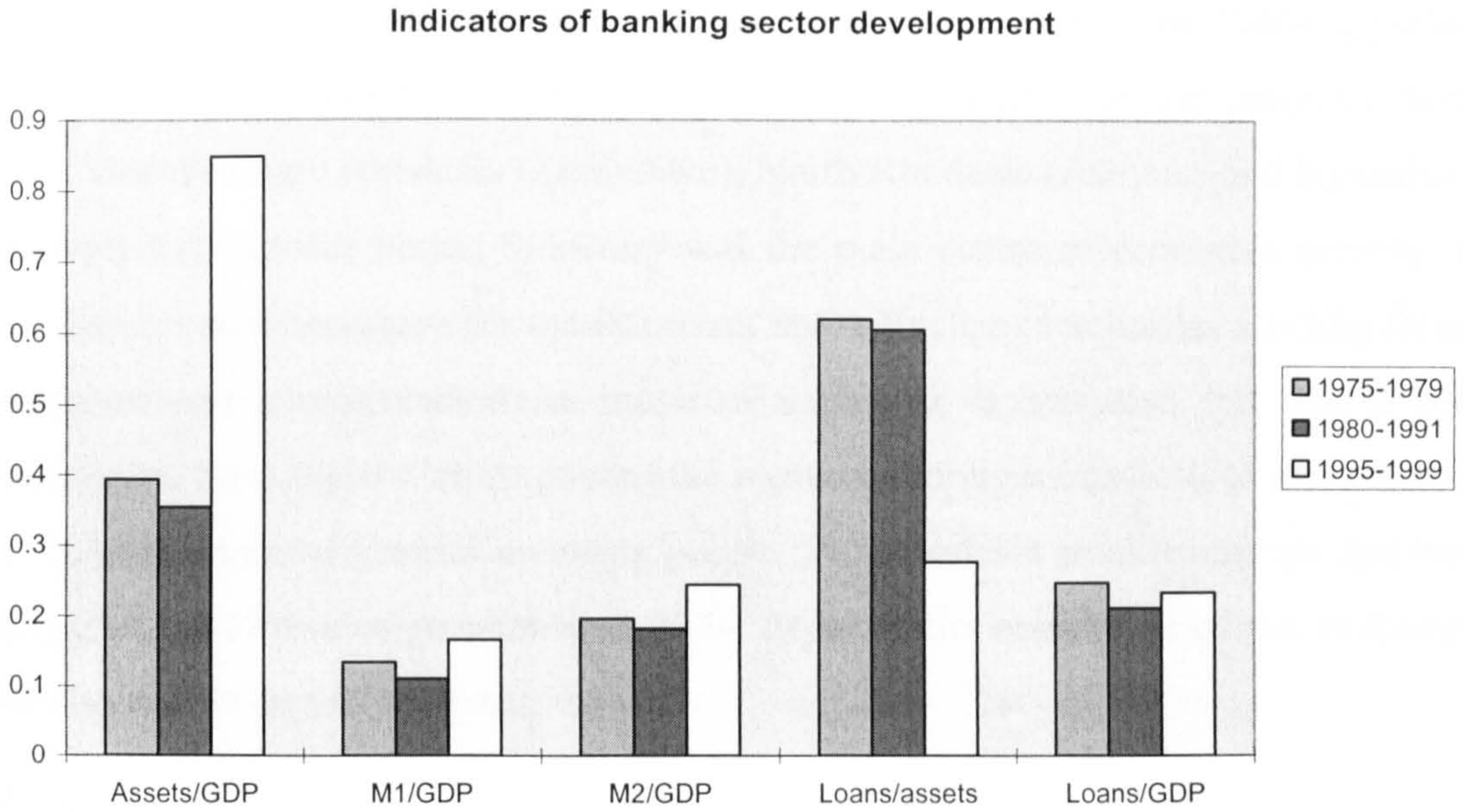
Figure 1.1; Indicators of banking sector development 1975-1999



Notes: Evolution of banking sector development ratios 1975-99

Source: Own calculations, using data from Quarterly Economic and Statistical Review Reserve bank of Zimbabwe

Figure 1.2



Notes: Average banking sector development ratios during UDI (1975-1979),
Independence (1980-1991) and Reform (19992-1999)

Source: Own calculations, using data from Quarterly Economic and Statistical Review Reserve bank of Zimbabwe

1.2.1.2 Zimbabwe Stock Market

In theory, one of the major sources of corporate finance is the stock market. In Zimbabwe there is only one stock market with a long history. The first stock exchange in Zimbabwe was established in Bulawayo (the second largest city) in 1896. Later in the same year two other exchanges started operating in Gwelo (third city) and Umtali (fourth city). The main purpose of these exchanges was to facilitate the exchange of ownership of mining claims. Although Zimbabwe is endowed with significant quantities of mineral deposits, mining activity declined after 6 years. As a result of this, all the three exchanges were closed by 1924.

A new exchange was established in Bulawayo, where dealing started on 2nd January 1946. Another floor was opened in Salisbury (now Harare) in 1951. The exchange

was named Rhodesia Stock Exchange[3]. The trading between the two centres was done through the telephone. The activities of the exchange expanded in the 1960s, a period of Federation of Rhodesia and Nyasaland. This was a period of the union of three states, namely South Rhodesia (Zimbabwe), North Rhodesia (Zambia) and Nyasaland (Malawi). During that period Salisbury was the main centre of economic activity. It therefore became necessary for the Rhodesia Stock Exchange activities (trading floor, secretaries and administration) to move to Salisbury. It was also felt that it was necessary to have legislation to govern the rights and obligations both of members of the exchange and the general investing public. The Rhodesia stock exchange Act was passed by the House of Assembly in 1974. Most of the operations of the exchange today are based on the 1974 Act.

In 1980, the name of the exchange changed to 'Zimbabwe stock exchange'. Although the exchange has been in operation for more than 50 years, it is still small in global terms, although it is the second largest exchange in Southern Africa. Only seventy-three companies are listed on the exchange. The trading system is call over. Business days are Monday from 08:00 to Friday 16:30. Trading hours are 09:00am to 09:30 am and then 11:45am to 12:15 pm. There are three main roles of the Exchange in the economy. It plays an intermediary role between companies in need of funds to expand and people with funds to invest. The second function is the provision of a market for trading of existing shares at market-determined prices. Finally, it provides a regulated environment for the fair-trading of shares. There are five types of shares listed on The Zimbabwe Stock Exchange (ZSE). They are ordinary shares, preference shares, bonus issue, rights issue and debentures. A committee made up of stockbrokers and government representatives runs the ZSE. Trading of stocks is done through stock broking firms, which are members of the ZSE. There are ten stockbrokers. They do not, however, offer the same services. Some offer investment and financial planning services, while others offer trading services only. Kingdom securities Pvt Ltd and Bard stockbrokers have more extensive research departments than the rest. In general, stock broking firms offer advice on investments such as shares, debentures, government bonds, new company share floats and rights issues. All transactions must

[3] Rhodesia is the former name of Zimbabwe.

be completed within the ZSE. Disputes may arise due to unfair trading and such disputes must be referred to the committee.

Transaction costs

Costs incurred by traders are in the form of charges (commission) and taxes. There is a basic charge of Z$20. 00 on both buy and sell transactions. In addition to this basic charge, a stamp duty of Z$0.45 per Z$100.00 of shares purchased or sold is also charged. Transfer fee, on purchase, is Z$20.00. Brokerage rates are as shown in table 1.1 below

Table 1.1

Brokerage rates: Ordinary and Preference shares

	Consideration (Z$)	*Rate %*
On the first	50 000	2.0
On the next	50 000	1.5
Over	100 000	1.0

Source: ZSE handbook (2000)

Dividends and capital gains are taxed in Zimbabwe. Withholding tax on dividends is 15% and capital gains greater than Z$5 000 attract a tax of 10 %, but there is a 15 % inflation allowance.

The exchange has been open to foreign investments since 1 June 1993. A foreigner can now participate on the Zimbabwe stock exchange without first seeking the approval of the Exchange Control authority. However, participation of foreign investors is restricted to 10 % of total shareholding per individual and 40 % collectively of each company. Repatriation of income and capital is free and foreign investors qualify for a 100% after - tax dividend remittance. There is also freedom for foreign investors to register shares in either their names or names of nominee companies.

The opening of the exchange has witnessed an increase in capital inflows as shown in table 1.2 below. The highest net foreign capital inflow was witnessed in 1995. The net

outflow recorded in 1999 is partially explained by the political instability in the country, which started at the end of 1998.

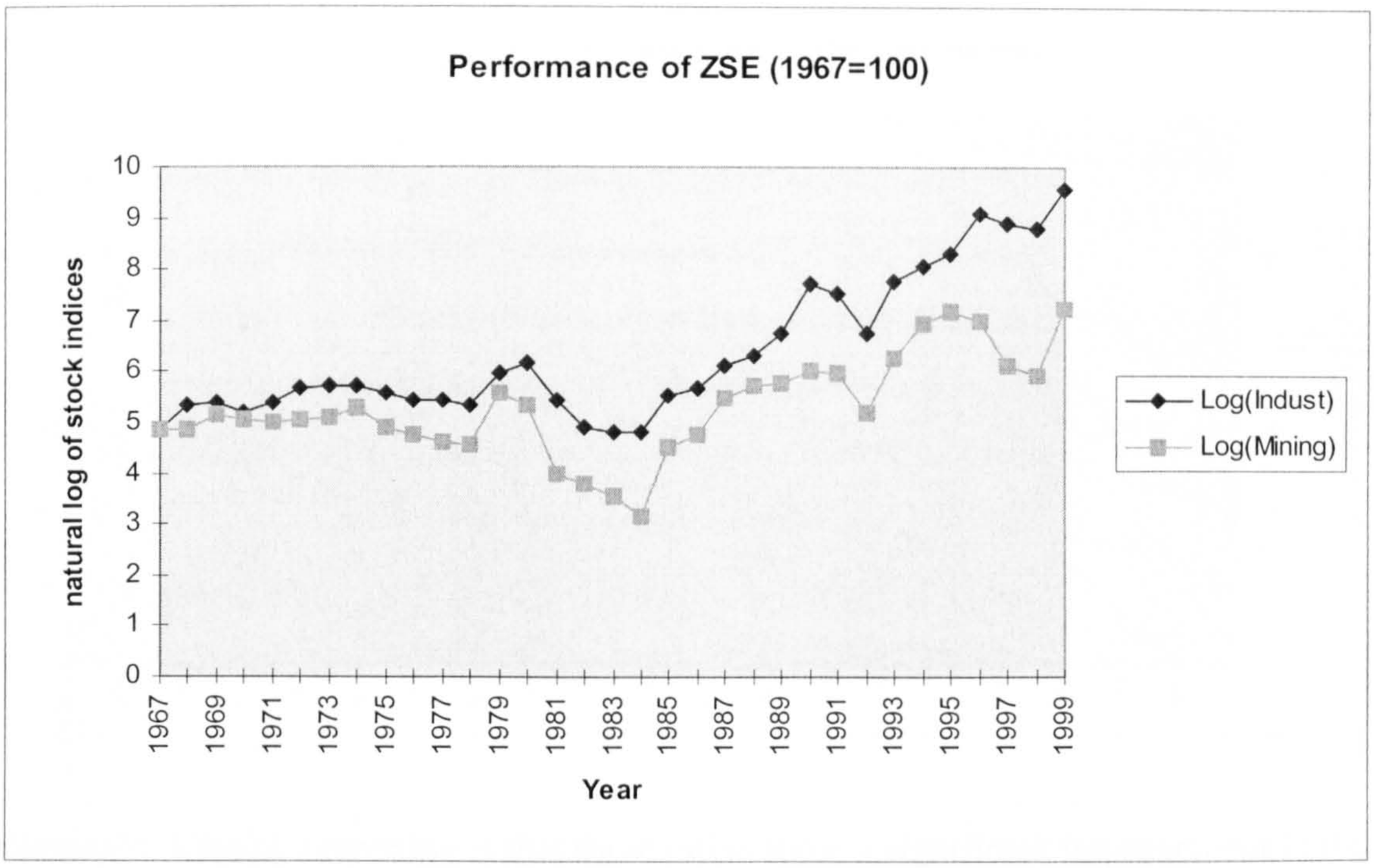
Table 1.2 Monthly foreign deal analysis on the ZSE

	1994	1995	1996	1997	1998	1999
Shares bought (Z$m)	696	766	817	1809	1320	1019
Shares sold (Z$m)	241	223	771	1398	896	1454
Net inflow (Z$m)	455	543	46	411	424	(435)

Source: ZSE handbook (2000)

The Zimbabwe Stock exchange publishes two indices, one for the industrial companies and the other for mining companies. The industrial index measures the performance of all industrial shares while the mining index is a representative of mining shares. The term " industrial " is misleading in this case, since other shares not in the industrial sector are also represented by this index. Nine mining companies are listed on the exchange. The movement in these two indices are shown in figure 1.3. The base year for each index is 1967. It is evident from the diagram that the financial reform programme had an impact on the performance of the Zimbabwe stock Exchange. The management of the ZSE also made an effort in making the public aware of the existence of the stock exchange and benefits of investing. Besides, the massive advertising through the media, they also printed brochures in the other two languages commonly used in Zimbabwe. The increase in the demand for shares pushed up stock prices of most companies and we would expect such increases in stock prices to influence the financial behaviour of listed companies. In particular, this might influence firms to use more equity financing. However, the movement in stock prices was not smooth. For example, in 1983/84 and 1992/93 the market performed poorly due to severe droughts during those periods.

Figure 1.3



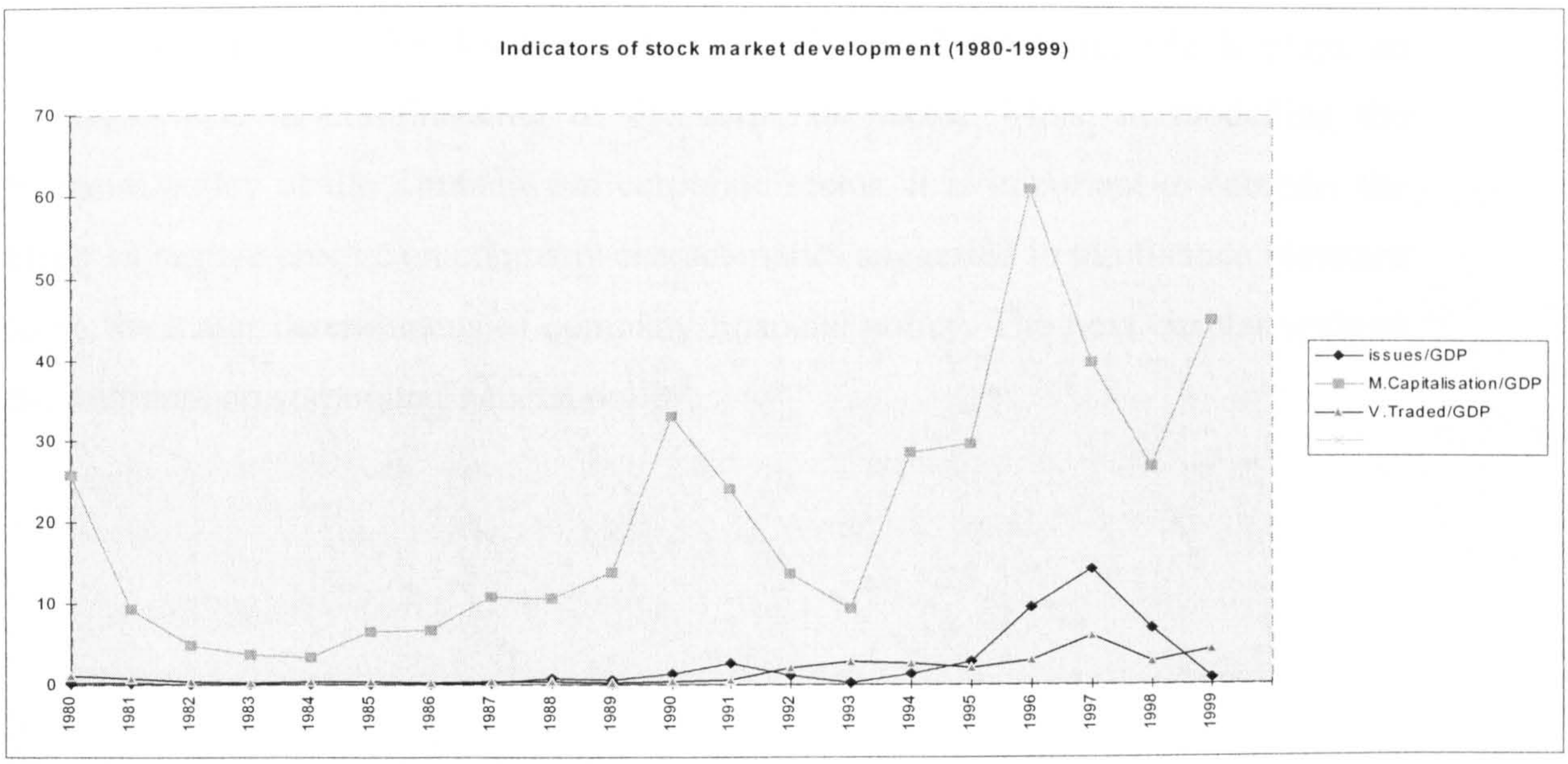
Notes: Performance of the Zimbabwe Stock Exchange from 1967-1999 as shown by the natural logarithm of industrial and mining indices

Source; own calculations, using data from Zimbabwe Stock Exchange

Indicators of Stock Market development

Apart from the Johannesburg Stock Exchange in South Africa, most stock markets in Africa, are small in relation to the size of their economies. Kitchen (1987), argues that low percentage turnover to market capitalisation is an indication that market activity is low and also that shares are tightly held. The market capitalisation/GDP, new issues/GDP and value traded/GDP ratios, shown in figure 1.4, also confirm that the Zimbabwe Stock Exchange is very small.

Figure 1.4



However, what is interesting is that these ratios show a significant improvement in the late 1990s. But the rate at which companies go public is not as rapid as in other developing countries, especially from East Asia. However, in the case of Zimbabwe, some companies are not listed on the ZSE simply because they cannot meet the requirements. The listing requirements are too high for 'indigenous companies', which are very small. It becomes necessary for the Exchange to come up with listing requirements, which are in line with these companies. Such a need was realised worldwide. For example, in Europe, Easdaq (European Association of Securities Dealers Automation) caters for the needs of young entrepreneurial firm. A similar market, Nasdaq, in US has raised finance for small companies. It can therefore, be concluded that though, the Zimbabwe Stock Exchange has shown some substantial improvements in the recent past, only large firms are listed.

1.3 Summary and Conclusions

The discussion from this chapter suggests that the evolution of the political economy of Zimbabwe might have an important impact on corporate financial behaviour. The evolution of the financial system, as shown by the indicators of banking and stock

market development, also suggests that the political economy of Zimbabwe had a significant effect on the development of the financial structure, which plays an important role in the financing of the corporate sector. Thus, in modelling the financial policy of the Zimbabwean corporate sector, it is important to consider the effect of regime change on company characteristics suggested in the finance literature to be the major determinants of company financial policy. The next chapter reviews the literature on corporate financial policy.

Chapter 2- Literature Review on corporate financial policy

2.1 Introduction

This chapter will provide a brief literature review about corporate financial policies. The first section begins with a survey of the literature on corporate capital structures. This is then followed by a survey of the literature that has examined the determinants of cross-sectional variations in corporate dividend payout ratios. The third part of the chapter summarises the literature that argues that capital structure and dividend policies are interdependent and section four concludes.

2.2 Literature review on capital structure

2.2.1 The Theoretical determinants of capital structures

Controversy abounds in the literature on the importance of capital structure decisions. The revolution in modern corporate finance began when Modigliani and Miller (1958) demonstrated that under perfect market conditions, the capital structure decision was irrelevant to firm value. Such a conclusion, however, motivated finance researchers to re-examine the whole issue of corporate capital structures, such that over the past three decades theoretical models of capital structure have been added to the finance literature. However, some of the theoretical models suggested in the literature are very complicated and of little use since they can hardly be put to empirical verification. The most successful critiques of the Modigliani and Miller (1958) model have proposed factors based on imperfect market conditions such as agency costs, asymmetry information and corporate tax to be the major determinants of corporate capital structure. Most recently, corporate strategic behaviour has also been added to the list. The emphasis is on the impact of debt policy on firm value. The main result drawn from these studies is that, the corporate capital structure decision is not just a choice between debt and equity financing based on their relative costs and benefits as was believed in the 1960s. The more recent theories have emphasised the relative

importance of private and public instruments together with the degree of concentration, ownership and the homogeneity of holdings of these instruments. The corporate governance issue has also been incorporated into the capital structure theory. There is no doubt that these theoretical models have increased our understanding of capital structure choice. Harris and Raviv (1991, p.299) point out that the theoretical models "have identified a large number of potential determinants of capital structure. The empirical work so far has not, however, sorted which of these are important in various context". This is an important observation, given that market imperfections are more pronounced in some countries than others. In particular, the financial systems in industrialised countries are well developed such that firm access to both financial and capital markets is easier than in developing countries. In this case, empirical evidence from different countries will enhance our understanding of corporate capital structure decisions. The following subsection presents a summary of theoretical models based on taxation and bankruptcy costs, agency costs, asymmetric information and corporate strategy assumptions.

2.2.1.1 Theories based on Taxation and Bankruptcy costs

Some of the crucial elements of reality that have been incorporated into the Modigliani and Miller (1958) irrelevance model are corporate tax, (Modigliani and Miller, 1963) personal income taxes (Miller, 1977), bankruptcy costs (e.g., Baxter, 1967; Kraus and Litzenberger, 1973), and non-debt tax credits, (DeAngelo and Masulis, 1980). Using different theoretical models, the firm's capital structure decision was found to be either relevant (Modigliani and Miller, 1963; Kraus and Litzenberger, 1973; DeAngelo and Masulis 1980, among others) or irrelevant, (Miller, 1977). Those who have found the firm's capital structure to be relevant argue that a unique internal optimal capital structure does exist.

In a world of corporate tax, Modigliani and Miller (1963) consider two firms with identical operating cash flows, but with different capital structures. The first firm uses equity finance exclusively to fund its investment projects (unlevered firm), while the second one uses a mixture of debt and equity (levered firm). In this framework they demonstrate that the market value of the levered firm is equal to the market value of the all equity firm plus the present value of the debt premium and thus implying that

debt has an impact on cash flows. The explanation for this is that interest payment on debt is tax deductible, which means that the tax liability of the levered firm is lower than that of an all equity firm. This tax saving (which is a product of the corporate tax rate and debt obligation) advantage of debt financing has two paramount implications in the theory of capital structure. Firstly, the more the amount of debt in the capital structure, the greater the market value of the firm. Secondly, an increase in the corporate tax rate will in turn increase the market value of the firm. However, finance researchers have argued that it is the increase in corporate tax rate that leads to a higher corporate debt level (see, Kale and Noe,1992). In the Modigliani and Miller model, the maximum market value of the firm is reached when it approaches one hundred percent debt financed. Such a conclusion, however, does not conform to what is observed in practice. In the real world firms do not finance their investment projects exclusively by debt. In this respect, an important question is; if there is an advantage of debt over equity financing, why is it that most firms have very low debt ratios? Modigliani and Miller suggest that under certain circumstances other forms of financing might be cheaper than debt, lenders may also put a limit to the amount of debt that a company can borrow and other costs related to the debt financing (i.e. implicit costs of debt, which are positively related to the debt ratio) may explain the low levels of corporate debt observed in practice.

The debt related costs, namely direct and indirect bankruptcy costs, were explored by Baxter (1967). The direct costs of bankruptcy are the various administrative expenses like legal fees and trustee's fees, which are incurred when a corporation goes bankrupt[4] (is liquidated or reorganized). However of greater importance are the indirect costs of bankruptcy. These "include reduction in future sales due to customers' doubts of the reliability of the bankrupt firm as a supplier; difficulty in obtaining trade credit; higher production costs due to dislocations within the company and renegotiations of contracts for employees; and the time lost by executives in the reorganization procedure", Kim (1978), p 47. Unfortunately these indirect costs of bankruptcy are difficult to measure in practice.

[4] Bankruptcy occurs when cash flows from the firm's assets are insufficient to cover the cash expenses-including the cash flows owed to the firm's debtholders, Chambers and Lacey, 1999, p.375.

According to Baxter (1967), there are two main reasons why corporations maintain low debt levels: firstly, the interest rate on debt is positively related to the debt-equity ratio, that is to say, high debt levels attract higher interest rates and thus increasing the cost of borrowing. Secondly, a succession of bad years might cause a highly levered firm to default on its debt payments, resulting in an increase in the probability of bankruptcy. This means that there is a trade-off between the tax saving and bankruptcy costs. Theoretically, the advantages of debt financing are greater than the corresponding bankruptcy costs at lower levels of debt, but for higher levels of debt, bankruptcy costs offset tax savings and therefore resulting in a U-shaped cost of capital function for the firm. The corresponding firm value function is therefore inverted U-shaped. The amount of debt at which the slope of the firm value function is zero gives the optimum capital structure. This conclusion, however, inspired other researchers to search for the existence of firm optimal capital structure (e.g. Kraus and Litzenberger, 1973; Brennan and Schwartz, 1978; Scott, 1976; Myers, 1984)

Kraus and Litzenberger (1973) formerly incorporate corporate tax and bankruptcy costs in a state-preference model. The model shows that the market value of the levered firm is equal to the value of the unlevered firm plus the market value of debt obligation minus the product of the complement of the corporate tax rate and the present value of bankruptcy costs. Thus, the presence of bankruptcy costs, though limiting the advantages of debt financing, ensures the existence of a unique optimal capital structure. Scott (1976), using a multi-period model of firm valuation, reaches the same conclusion.

Brennan and Schwartz (1978) have argued that tax savings make sense only when the firm is doing well (i.e. not bankrupt) because the tax shield is lost when the corporation goes through bankruptcy, reorganization or liquidation. Moreover, a higher debt level reduces the probability that the firm will survive in the near future and thus increasing the uncertainty of tax shields. Brennan and Schwartz also demonstrate that this uncertainty of tax shields is sufficient to bring about an optimal capital structure without necessarily incorporating bankruptcy costs in their differential equation. Furthermore, it is demonstrated that higher probability of bankruptcy, associated with higher business risk, leads to lower optimal leverage ratio.

In addition, Kim (1978) argues that it is necessary to search for an optimal capital structure in conjunction with debt capacity. He defines debt capacity as the maximum amount of debt that a firm can borrow in a perfect capital market. The argument is that, optimal capital structure is irrelevant if debt capacity occurs first, since a firm cannot borrow beyond its debt capacity level. If, however, debt capacity and optimal capital structure occur simultaneously, the value of the firm will be maximized by financing the investment projects exclusively by debt. Lastly, an optimal debt less than debt capacity, ensures the existence of a unique optimal capital structure in the presence of bankruptcy costs.

Miller (1977), building on the empirical findings of Warner (1977) argues that bankruptcy costs are relatively small in relation to the tax savings. Miller observes that the level of debt for U.S corporations remained stable over a period of 30 years, despite a substantial rise in corporate tax rates. This implies that debt ratios for these corporations were not responding to the changes in corporate tax rates as the theory predicts. In this respect, corporate tax and bankruptcy costs seem to be deficient in explaining the observed capital structure. Miller introduces differential personal income taxes on equity and debt incomes into his equilibrium model. He made an assumption that the personal income tax system favours equity income. This makes sense since capital gains, which are a component of equity income, are taxed at a lower rate than ordinary income. In the Miller equilibrium, there are no bankruptcy costs such that corporations can use either debt or equity financing exclusively, depending on which is cheaper. In this case, the supply curve for debt is horizontal. The demand curve can be analysed in two parts; the first part of the demand curve, which is below the supply curve, is horizontal. For this part of the demand curve, tax-paying investors shun holding debt since the rate of return is lower than that of equity (due to tax on debt income). Only tax-exempt investors have the incentive to hold debt, but once the funds from tax-exempt investors are exhausted, the return on debt must be high enough to induce taxable investors to hold debt and at this point the demand curve begins to slope upwards continuously. The point of intersection of the two curves is where taxable investors are indifferent between holding debt and equity. The market equilibrium that is obtained is for the aggregate debt ratio for the corporate sector and therefore capital structure is irrelevant at the firm level, since corporate tax advantages are offset by personal tax disadvantage.

DeAngelo and Masulis (1980) and Kale and Noe (1992) extend the Miller equilibrium model in other important ways. DeAngelo and Masulis (1980) extend the Miller model by incorporating non-debt tax shields such as depreciation allowances and investment tax credits. The non-debt tax shields are found to have a significant impact on the debt ratios, since they are substitutes for tax savings. The presence of such non-debt tax shelters reduce the benefits of using debt financing since they reduce the income shielded from debt. Importantly, their state-preference model shows that the corporate debt level is negatively related to non-debt tax shields and bankruptcy costs, but positively related to corporate tax rate.

In addition, Kale and Noe (1992) have demonstrated that the observed capital structure of U.S corporations is consistent with what the theory of capital structure, based on corporate tax and bankruptcy costs, actually predicts. They first define financial distress as a period prior to bankruptcy. During this period the firm's cash flows fall below the debt premium and the firm adjusts to a lower optimal debt level in order to be able to meet the coupon payments on debt. On the other hand, they demonstrate that in the extreme case whereby the costs of financial distress are zero, a change in corporate tax rate has no effect on the optimal debt level because the benefits and costs induced by a change in taxes offset each other. In general, the change in optimal debt level with respect to a change in corporate tax depends on the magnitude of the proportion of direct cost to the total cost of financial distress. This magnitude was, however, found to be very small. Thus, in this model low debt levels are associated with low bankruptcy costs, which is consistent with what is observed in the U.S corporate capital structures.

2.2.1.2 Theories based on Agency costs

The modern corporation is characterised by separation of ownership and control. Usually a large number of small owners delegate the day to day running of the firm to management. However, it is most likely that managers may pursue their own interests at the expense of the shareholders; therefore a monitoring device is required. Designing an appropriate capital structure mitigates this agency problem by

constraining managerial behaviour and thus affecting the performance of the firm. The following subsection argues that debt, as well as its substitutes, play an important role in capital structure decision. However, some of the agency costs are magnified by using debt financing and it is therefore necessary to note that there are agency costs that encourage the use of debt financing while others discourage its use (Chambers and Lacey, 1999).

A separation between corporate ownership and control has an important impact on corporate decisions. Jensen and Meckling (1976) argue that conflict of interests between managers and shareholders or between shareholders and bondholders may arise. This conflict of interests creates agency costs which in turn lead to sub optimal business decisions (Barnea *et al,* 1981). However, it has been argued in the literature that the financial policy of a corporation can be designed in such a way as to mitigate this agency problem[5]. This line of argument started with Jensen and Meckling (1976) whose model shows that debt in the capital structure reduce the conflict between managers and outside equity holders. The fundamental assumption is that both agents (managers) and principals (shareholders) seek to maximise their own self-interests. The managers derive utility from the consumption of perquisites (empire building), which uses corporate resources that could have been used to increase firm value. This behaviour is not in the best interest of shareholders and thus calls for a monitoring device. In the Jensen and Meckling model, consumption of perquisites is the major source of conflict between management and outside equity holders. In order to show the nature of the conflict they consider a situation whereby the owner manager owns one hundred percent shares of the firm. In this case the owner-manager, by consuming pecuniary and non-pecuniary benefits, bears all the benefits and costs of his behaviour and therefore, has an incentive to cut down on the consumption of perquisites. If the manager were to issue shares such that he owns a fraction, α, of the firm, he will have a greater incentive to increase consumption of perquisites since he now bears only a fraction of the costs. This implies that as the fraction of managerial ownership declines, more perquisites are consumed and thus calls for the need for shareholders to monitor management behaviour. However this is not possible because of the free rider problem. Jensen and Meckling argue that under perfect market conditions the rational

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[5] See for example, Jensen and Meckling (1976), Grossman and Hart (1980), Stultz (1990) and Harris and Raviv (1990).

investors expect this behaviour and react by paying low share prices. In other words, the capital market makes the owner-manager bear all the agency costs of outside equity. In this sense agency costs reduce firm value. One way to avoid this loss of firm value is to hold the managers' absolute investment in the company constant and then finance the required investments by debt.

However, increasing the amount of debt in capital structure is not costless, bankruptcy costs and other agency costs of debt increase as the debt level rises. In certain circumstances the use of debt finance may lead to another conflict between stockholders and debt holders. Two different types of agency costs, namely asset substitution and under-investment have been discussed in the literature. The asset substitution problem occurs when bondholder wealth is transferred to equity holders. Bondholders lend money to the firm with the belief that investment projects undertaken will have a certain risk level and they charge an interest rate on bonds accordingly. The bondholders are concerned with receiving the interest and principal payments. But once the stockholders get the money, there is no guarantee that they will act in the best interest of bondholders *ex post*. In fact debt provides an incentive for owner-managers to substitute riskier investments for less risky ones. Jensen and Meckling have demonstrated that such behaviour redistributes wealth from bondholders to stockholders. In order to protect their interests, bondholders resort to a variety of contracts such bond covenants and collateral. Such contracts are costly to the owner managers and therefore limit the use of debt financing. Myers(1977) also argues that debt financing may lead to under-investment problems. He asserts that stockholders may pass up value-increasing projects if the firm is in financial distress, because investing in such projects implies that bondholders will reap most of the profits.

Debt financing can also reduce the conflict in a way suggested by Grossman and Hart (1982). Their model differs from the Jensen and Meckling in the sense that management share ownership is assumed to be close to zero, implying that managers have even higher incentives to consume perquisites. However, if debt is issued, management has an obligation to meet debt repayment otherwise the firm will be taken into bankruptcy court. On the other hand bankruptcy has a negative impact on management welfare since it means loss of jobs and perquisites. It follows that the

threat of bankruptcy motivates managers to maximise profits. Higher debt ratios, therefore, convey to investors the information that management is pre-committed to undertake decisions that maximise the market value of the firm. Therefore, the debt level is positively related to market value of the firm.

Jensen (1986) argues that debt mitigates the over-investment problem by considering free cash flow as the source of conflict. Managers are concerned with the growth of the company, because it means greater reputation and more perquisites. This management behaviour leads to investing in projects with negative net present values (i.e. over-investment). On the other hand shareholders pressurise for higher dividend payout. Thus, free cash flow can be wasted by both shareholders and managers. However, debt creation reduces the cash flow available for such wasteful behaviour since the firm is under an obligation to repay debt when it is due. In this case debt is a better substitute for dividend and also serves as a pre-commitment to maximise share value. Thus the benefit of debt in resolving the over-investment problem is through reducing free cash flow. It should be noted that the Jensen (1986) thesis does not apply to firms with highly profitable investments, since large amounts of funds are required to finance such projects. In fact, the free cash flow problem is more pronounced in firms, which are mature with few growth opportunities.

Harris and Raviv (1990) argue that debt financing helps the liquidation decision. In their model, the quality of the firm depends on management effort and ability. Since investors cannot directly observe management behaviour, debt provides information about the quality of the firm in that the ability to repay debt conveys good news about the firm while the inability to meet debt obligation signals bad news. The ability to repay debt is an indication that cash flows exceed coupon payments therefore the firm is in a healthy state. On the other hand, default leads to costly investigations (e.g. auditing) about the true operations of the firm. Basing on the results of the audit report investors can decide to liquidate or continue with the firm's current operations. It should be noted that the liquidation decision is not acceptable to management, whose interest is to always continue with the firm's operation. In such a situation debt has an advantage over equity financing in the sense that debt holders can force firm liquidation by taking the firm into a bankruptcy court. On the other hand Sultz (1990)

argue that it is in the best interest of management to always want to invest even if paying out dividends is preferred by shareholders.

Large shareholders and institutional investors are the two substitutes for debt that have received a great deal of attention in the literature. It has been argued above that in situations where there is a single owner agency costs are very low. This implies that agency costs are very high when ownership is highly diffused. The problem with dispersed shareholders is that monitoring is costly for individuals. The individual shareholder owns a very small fraction of the company shares and if monitoring ends up in better company performance all shareholders will benefit. Such a free rider problem discourages small shareholders from engaging in monitoring activities. However, the free rider problem is less severe when ownership is concentrated (Shleifer and Vishny, 1986). The actions of holders of blocks of shares towards problem companies can be in the form of voice or by exit. Action by exit is facilitated in highly liquid capital markets. In contrast, bank based systems promote action by voice. The implication is that the existence of large shareholders mitigates the agency problem and therefore substituting the role of debt.

In the real world, large shareholders are normally financial institutions (institutional investors). The benefits of having firms as large shareholders is that they are active investors, which closely monitor the behaviour of management to the extent that they even ask for a seat on the board (Givazzi 1999, Bathala, 1999). This reduces the role of debt as a governance device. Short (1997), however, argues that debt financing by a single bank enhances commitment to the firm such that in the event of default the parties may consider internal solution rather than going to the bankruptcy court. The implication is that concentrated ownership structure reduces agency costs of debt and risk of bankruptcy which in turn encourages higher debt levels.

However there are costs associated with institutional investors. The most obvious is that bank monitoring activities are delegated to a bank manager and this introduces a new principal-agent problem. The other drawbacks as noted by Bathala, are that institutional ownership leads to short termism and also increases stock price volatility. This implies that there is a trade off between benefits and costs of large stakeholder ownership.

2.2.1.3 Theories based on asymmetric information.

The asymmetric information theory of capital structure is based on the assumption that the firm owner or managers (insiders) know better about their firm's prospects, risk and values than do outside investors. Pioneers in this strand of literature are Ross (1977) and Leland and Pyle (1977). These models have demonstrated that the capital structure signals private insider information to outsiders. In the Ross model, managers are the insiders. In contrast, the Leland and Pyle model hypothesizes that entrepreneurs (owner-managers) are the insiders who convey firm quality information to the outsiders through the medium of capital structure.

Ross's model hypothesizes that management compensation depends on firm value which is adversely affected by bankruptcy. Managers can then use the level of debt to signal quality of the firm. In this regard, managers of good quality firms can harmlessly take up more debt and those of poor quality firms cannot imitate them because of the threat of bankruptcy.

In the Leland and Pyle (1977) model the risk averse owner-manager is assumed to hold a fraction, α, of the firm's equity. In the case where owner-managers have good information about their firm, they will have an incentive to hold a larger proportion of the firm share ownership. On the other hand owner-managers with bad information about their firm will not imitate them. This implies that the size of the inside share holding signals the insiders' private information and outside investors respond accordingly. It is demonstrated that a rise in the owner-manager's share, α, leads to an increase in both the riskness of his portfolio and firm quality. In this respect, lenders perceive the true value of the firm to positively depend on the fraction of the share ownership retained by the entrepreneur. However, in order to increase the proportion of inside share ownership, new projects must then be financed by debt. Therefore, in an effort to retain a larger ownership of shares, good information about firm quality is signalled to outsiders and consequently good firms end up highly levered than bad ones.

The Pecking order theory

Myers (1984), Myers and Majluf (1984) present a theoretical argument for the old pecking order explanation for the corporate capital structure choice. In the model, issuing debt is less costly than equity because the later involves (incurs) underwriting costs. Managers are also assumed to act in the interest of existing shareholders. Because of asymmetric information the market will either over price or under price shares. It is , however, costly to educate investors and sell shares at the fair price. Since management is assumed to act in the interest of old shareholders they will always want to issue shares when they are over priced. However rational new shareholders expect this management behaviour such that the decision to issue shares is always perceived by the market as signalling bad information about firm quality. Consequently issuing shares will force the stock price to fall down. Under pricing the firm's equity in some situations is so severe that owner-managers choose to pass up projects even if they have positive net present values.

In order to demonstrate the conditions under which a firm issues shares and how firm value is affected, Myers presents the following model. Assume that the firm needs to raise N pounds in order to finance the new investment project, let P represent the opportunity's net present value and Q takes the firm value if the opportunity is forgone. Management is assumed to know the values of P and Q but potential investors only observe the joint distribution of possible values (P', Q'). Define N' as the real value of shares and $\Delta N=N'-N$. Since potential investors do not know the real value of shares, they may over or under value the shares. Shares are under valued if $N>N'$ and over valued if $N<N'$. Management acting in the interest will issue shares and invest only if $P \geq \Delta N$. This implies that firms will raise equity finance only if shares are overvalued by the market i.e. $\Delta N< 0$ and may forgo valuable investments if the market undervalues shares. This behaviour will lead rational investors, both old and new shareholders, to interpret the decision to issue as a signal of bad news. Defining V as the market value of the firm if it does not issue and V' if it does, Myers demonstrates that the conditions for equilibrium are:

$V=E(Q'/\text{no issue})= E(Q'/P<\Delta N)$

$V'=E(Q'+P'+N/\text{issue}) = E (Q'+P'+N/P\geq\Delta N)$

Myers argues that in this framework issuing shares creates an additional cost of passing up valuable investments if the market undervalues the firm's shares. He also argues that ΔN in absolute terms is always less for debt than for equity.

Therefore, information asymmetry about new investment projects and assets in place lead to under-investment problem. Raising funds internally or issuing alternative securities that are less under-priced by the market (e.g. convertibles) mitigates the under-investment problem. This implies that the firm will have a pecking order of financing choice. At the top of the pecking order is internally generated funds (i.e. retained earnings). If internal funds are not enough, the firm will seek external funds by considering the safest first. Thus debt is issued first, followed by hybrid securities and then new equity as a last resort. It is interesting to note that equity when it is in the form of private source (retained earnings) is at the top of the pecking order but is at the bottom if it is in public form (new equity). The implication is that firms do care about the providers of funds (i.e. private or public). Informational asymmetry between managers and shareholders provides a rationale for the existence of financial intermediaries. Banks with their monitoring role can be part of the insiders by having access to the private information about firm quality, for example financial statements and financial plans. Therefore financial intermediaries mitigate the asymmetric information problem. This implies that firms that keep a close relationship with financial intermediaries have higher market valuation than those that rely on capital markets for external financing. In contrast to the static trade-off theory, the pecking order hypothesis does not postulate the existence of an optimal debt ratio.

2.2.1.4 Theories based on corporate strategy

A good starting point is the work of Barton and Gordon (1987) who argue that capital structure decision is determined by managerial choice and that, "choice is based on the values and goals of management as complemented or constrained by relevant external threats and opportunities and internal strengths and weaknesses, p.45". On the basis of these assumptions they come up with five propositions.

Proposition 1: Top management attitude towards risk will affect the firm's capital structure choice. Barton and Gordon argue that since financial risk is a major determinant of the firm's debt/equity choice, the amount of risk that top management regard as bearable will influence the amount of debt in the firm's capital structure.

Proposition 2: Top management goals will affect the firm's capital structure choice. In this case, management is assumed to have different goals for the firm, for example, they might have a target firm growth rate. In order to achieve these goals management adopt certain strategic decisions such as acquiring other firms through borrowing, or having a target debt ratio. This implies that there is a direct relationship between sales growth and debt ratio and actual firm growth may be a sign that top management is concerned with a growth strategy.

Proposition 3: Top management would prefer to finance a firm's needs from internal funds rather than from external funds. Outside finance may affect top management's flexibility on decision-making. For example, discipline from the capital market and bank monitoring activities may restrict management discretion. In that case management would prefer internally generated funds rather than from outside sources. The implication is that profit is inversely related to debt levels.

Proposition 4: Top management's degree of risk aversion and financial characteristics of the firms determine the probability of defaulting. This proposition implies that external investor may limit the amount they lend to firms with high probabilities of defaulting and this in turn will determine the firm's capital structure.

Proposition 5: The firm's financial position relating to risk, managerial control has an important impact on managerial choice of debt ratio. Propositions 4 and 5 suggest an inverse relationship between risk to the firm (e.g. earnings variability) and debt levels.

Asset Specificity: In a transaction costs framework, Williamson (1988), argues that debt and equity finance should be seen as alternative governance structures. In this case, the choice between debt and equity will primarily depend on the characteristics of the assets being financed, in particular their redeployability to alternative uses. Investing in firm specific assets enhances the firm's uniqueness and competitive advantage (Balakrishnan and Fox, 1993). Financing specialised investments is problematic because most of the firm specific assets such as know-how, research and development, reputation are intangible and cannot be used as collateral for borrowing. Since these assets cannot be costlessly redeployed to other uses, lenders will recover

only a fraction of their investments if a firm defaults and is liquidated. In this case, debt-holders are unwilling to provide finance for such investments. In other words, specialised investments are so risky such that lenders demand higher rates of return. Furthermore, Williamson argues that debt finance is not suitable for specialised investments since it is unforgiving when the firm defaults. In order to avoid the problems associated with debt finance, firms might respond by passing up some of the specialised investments. Williamson further argues that equity finance, which is more forgiving than debt, mitigates this under-investment problem in the sense that it gives more confidence to the financiers since their interests will be safeguarded by the board of directors. The board of directors allow more management discretion and at the same time intervene in the day-to-day operations of the firm. In this case, equity finance is regarded as having a stronger governance abilities than debt. Williamson observes that, although the costs of both debt and equity finance increase as the degree of asset specificity increases, debt finance costs rise at a faster rate. This implies that debt finance is suitable for highly deployable assets while equity is suitable for highly firm specific assets. He illustrates this point as follows; define k as an index of asset specificity, and let E(k) and D(k) be the respective cost functions of equity and debt. If k* is the value of k obtained when E(k) = D(k), then for k<k* debt will be used to finance all the projects and equity will be used when k>k*. In this case, the transaction cost economics, just like the perking order theory, views equity as the natural financial instrument of last resort.

Diversification: Kochhar and Hitt (1998) argue that diversification is a costly strategy, which requires a significant amount of resources. In this case a firm's internal funds may not be enough to meet such a substantial amount such that firms have to seek external financing. An important distinction is made between related diversification and unrelated diversification. Kochhar and Hitt argue that related diversification is regarded as a strategy of adding more to firm-specific assets of which monitoring, negotiating and enforcement of the contract between outside investors and managers is very complex. Therefore, entry into related diversification or unrelated diversification has an important impact on transaction costs between managers and investors such that the later cannot effectively monitor the behaviour of the former. Selecting the appropriate type of financing however, mitigates this moral hazard problem. The implication of the analysis is that debt financing is positively related to unrelated diversification while negatively related to related diversification.

Kochhar and Hitt further argue that diversification by direct entry increases the asymmetric information problem between managers and potential investors because there is no historical record on which to base the assessment of profitability of the firm and management capabilities to successfully run the new business. This implies that direct entry diversification will limit the ability of potential investors to accurately access the risk and value of the new investment. The end result is either under investment or a higher cost of capital. As argued above, turning to the private financing source such as banks mitigates this adverse section problem and thus a direct entry diversification strategy is associated with a high proportion of external private funds.

2.2.1.5 Summary of theoretical results

In summary, debt financing is mainly attractive because of the tax advantage of interest deductibility. In this respect, an increase in corporate tax rates should lead to an increase in debt levels. On the other hand, since the corporation must make regular interest payments on debt, a succession of bad years (where cash flow is less than interest payment) may force a firm into bankruptcy. Therefore, profitability of the corporation is a pre-requisite for a tax shield. In addition, personal income taxes may offset the benefits of tax savings. In the Miller equilibrium model, an increase in corporate tax rates leaves corporate debt levels unaffected if followed by a parallel movement in personal tax rates (Taggart, 1985). Personal taxes also limit the flexibility of an unlevered company in changing its financial structure because of the existence of share repurchase costs (Stiglitz, 1988). The existence of non-debt tax shields also makes debt less attractive. This is very important in the context of developing countries where investment incentives such as depreciation allowances and investment tax credits are common in order to lure foreign direct investors. Therefore, the debt levels for such corporations are expected to be very low. More important is the fact that most of these models are developed in the U.S tax system context where there is double taxation of income. The impact of taxation on corporate debt levels might be found to be neutral for other tax systems different from the US, for example, the UK imputation tax system (Rutterford, 1988). This calls for empirical testing of

the models, especially using data from developing countries that have tax systems different from their industrialized counterparts.

Debt financing is also attractive if ownership is dispersed because it mitigates the manager-shareholder and shareholder-bondholder conflicts. In the case where firms are profitable and have few growth opportunities debt financing reduces free cash follow which often a source of conflict between shareholders and managers. Debt financing also act as a monitoring device since managers whose firms are highly leveraged have an obligation to repay the debt and the interest. Thus the role of debt as a governance device is reduced where alternative forms of firm monitoring exist. The implication is that alternative monitoring devices such as ownership concentration and institutional ownership reduce the need for debt financing as a device of reducing manager-shareholder conflict. Higher debt ratios also convey information to investors that management is pre-committed to undertake discussions that maximise firm value. Thus in other words the ability to repay debt conveys good news to the public that the firm is of good quality.

The asymmetric information capital structure models are based on the assumption that the firm owners and managers have superior knowledge about the firm's prospects, risk and value than the outside investors. Therefore in the case where owner-managers have good information their firm, they will have an incentive to hold a larger proportion of the firm share ownership. In this respect, new projects are financed by debt in order to avoid share dilution. Thus suggesting that insider ownership is directly related to leverage. The pecking order hypothesis, however, suggests that the firm will finance its investments by cheaper sources first, internal finance, and will consider external equity finance as the last resort.

The corporate strategy literature suggests that asset specificity plays an important role in determining the corporate capital structures. Firms that have invested in tangible assets have lower bankruptcy costs than firms that have invested in intangible assets and the former can therefore support higher debt levels. The strategy to diversify also plays an important role in determining the level of firm leverage. Diversification is a costly strategy that requires external financing and depending on the nature of

diversification a firm might get the additional funding in the form of equity or debt. Thus the level of diversification may be directly or inversely related to leverage.

An important conclusion from this survey is that; market imperfections based on taxation, information asymmetry, agency problems and corporate strategy determine debt policy. In this regard, the relationship of debt policy to explanatory variables from competing theories is hypothesized to impact firm value, therefore making capital structure decisions relevant. Table 2.1 below presents testable theoretical results from the survey, in particular, the determinants of corporate leverage as suggested by different theories.

Table 2.1. Theoretical Determinants of Debt Ratios.

Firm Factor	Impact on Leverage	Reason	Model	Reference
Profitability	Positive	Pecking order hypothesis	Asymmetric information	Myers (1984)
	Negative	Enhances firm's ability to borrow		
Size	Positive	Less vulnerable to bankruptcy	Asymmetric information	Myers (1984)
Free Cash Flow	Positive	Pre-commitment	Agency	Jensen(1986)
Growth opportunities	Negative	Under-investment problem	Agency	Myers (1977)
Asset Tangibility	Positive	Collaterals	Agency	Jensen and Meckling (1976)
	Positive	Reduces bankruptcy costs	Transaction costs	Williamson (1988)
Risk	Negative	Bankruptcy costs	Transaction costs	Myers (1977)
Corporate tax rate	Positive	Reduces corporate tax burden	Taxation	Modgliani & Miller (1963)
Non-debt tax shields	Negative	Shields firm tax	Taxation	DeAngelo & Masulis (1980)
Asset diversification	Positive	Reduces risk		

The different theoretical determinants of leverage are shown in the first column. The second column shows the hypothesized impact of each variable on leverage. Column three indicates the reason for the effect (positive/negative) as suggested by different theories. The fourth and fifth columns contain some of the references to the theories and models respectively. It is interesting to note that profitability, managerial stock ownership, firm regulation and ownership concentration are hypothesized to have different impacts by different theories. In this case we suggest that empirical testing

could be useful in solving the contradictions, since some of the theoretical arguments are less important in other economic environments. The following subsection discusses the empirical work on determinants of capital structure in different countries.

2.2.2 Empirical Research on Corporate capital Structure

2.2.2.1 Introduction

There is a large volume of empirical work on capital structures of firms found within industrialised economies and few studies have empirically examined corporate capital structures in developing countries. Some of the empirical studies have focused on inter-country comparisons of corporate capital structures while others have mainly examined the determinants of capital structures of firms within one particular country. As observed by Prasad *et al* (2001), the two main methodologies which have been used to investigate corporate capital structures are; ratio analysis and econometric analysis. Of course, each approach has its merits and demerits. The ratio (univariate) analysis approach has mainly been used to analyse corporate financing patterns in different countries. It seeks to find out how investment growth is financed in different countries. In other words, given that investment growth could be financed from internal or external (debt or equity) sources, which source of finance has been a dominant one over a given period of time? The results from such studies can be used to assess whether the financial system of a particular country is market or bank based. Consequently, firms operating in bank-based economies are naturally expected to be highly leveraged and that is one aspect of the determinants of firms' debt policies. However, such empirical studies on their own, do not add much knowledge to the capital structure literature since other potential determinants are not addressed. In the broadest sense, the determinants of corporate capital structures within a country or across countries are classified under micro and macro factors. McClure *et al* (1999) has narrowly defined them as international environment, local country environment and firm-specific factors. The econometric approach is an attempt to investigate these factors

In this study the empirical literature on corporate capital structures is divided into two categories. First, we discuss the empirical research on corporate finance patterns in both developed and developing economies and then present the empirical studies that have analysed cross sectional variations in corporate capital structures. The former literature has relied on ratio analysis while the latter has mainly relied on econometric methodology.

2.2.2.2 Corporate financing patterns

Studies on corporate financing patterns are mainly concerned with finding persistent and common features of firms in their funding of real investments (Hackethal and Schmidt, 1999). The study of financing patterns is crucial in the sense that it gives a basis on which to evaluate the perfomance of the financial system in a given country in funding industry (Hackethal and Schmidt, 1999). It also provides a basis on which to empirically test the theories of corporate finance (Mayer, 1988 and Corbett and Jenkinson, 1997), in particular, the relative importance of different financial markets in funding the corporate sector. Policy makers also need this information when they look for ways to improve the functioning of a given country's financial system. This is important, especially, in developing countries where financial repression and market imperfections have limited the growth of corporations and as a result policymakers have been trying for the past decade to address this problem.

The net asset sources methodology (variously defined), using either balance sheet or flow of funds data, has been mostly used in this line of research.[6] Although, balance sheet (company accounts) data is the most reliable, there are, however, two major drawbacks. Firstly, the data (for research purposes) is only accessible for public companies. Secondly, inter-country comparison is seriously hindered by accounting standard differences across countries. On the other hand, flow of funds data cover the

[6] See Corbett and Jenkison (1998) and Hackethal and Schmidt (1999) for a discussion of the net sources methodology and Green (1994) for a discussion of flow of funds methodology.

whole corporate sector but are not as reliable as company accounts data because they are drawn from different sources and are therefore prone to measurement errors.

However, regardless of the sources of data most of the studies have employed either the Mayer(1988, 1990) or the Singh and Hammid (1992) methodology. The Mayer net sources methodology treats depreciation as a source of finance. In this case, the net contribution from each source of finance is first computed before being expressed as a proportion of physical investment. Thus, net bank finance is the difference between bank loans and cash plus bank deposits, net equity finance is the difference between new equity issues and equity purchases and net bond finance is bond issues less bond purchases, net trade credit (trade credit received less trade credit given) all expressed as a fraction of total physical investments. On the other hand, the Singh and Hammid methodology measures internal finance as retained profits net of depreciation. In this case, there are three sources of finance; net internal finance (retained profits less depreciation), external debt (bank loans plus bonds) and external equity (1 – internal finance – external debt). Each net source of finance is then expressed as a proportion of net assets (total assets less current liabilities). This implies that there is a significant methodological difference in computing net sources of finance (Cobham and Subramaniam, 1998). In particular, Cobham and Subramaniam argue that the use of gross equity in the Singh-Hammid approach exaggerates the role of equity finance and thus giving misleading results. They further argue that the Singh-Hammid methodology is inappropriate to an investigation of how physical investment has been financed, since it was designed to assess the growth of individual firms.

One strand of literature has examined patterns of finance in developed countries (Mayer, 1988, 1990; Corbett and Jenkinson, 1997 and Edwards and Fischer, 1994, among others) and another in developing countries (e.g. Singh and Hammid, 1992; Singh, 1995 and Samuel, 1996). However, in some cases, the corporate financing patterns in developing economies have been compared with those of their developed counterparts.[7]

[7] See, Singh (1995), Cho (1995), Sammuel (1996) and Cobham and Subramaniam (1998).

The Financing of the corporate sector in developed countries.

The first notable feature is a strong reliance on internal finance for firms operating in developed countries. Mayer (1988), using flow-of-funds data, has investigated corporate investment financing in the UK, USA, Germany, France and Japan. It is interesting to note that traditionally the UK and USA have been believed to have market based financial systems while the rest have been classified as bank based. *A prior*, the UK and USA should rely more heavily on equity finance than the other three. However, Mayer's results show that for the period 1970-1986, UK investment was universally self-financed. For the same period, internal finance was found to have funded 90 %, 73 %, 65 % and 62 % of total investment in USA, Germany, Japan and France, respectively.

The second notable feature is that loans are also a significant source of finance, especially in Japan where they contribute 42 % to corporate financing. Although Germany is traditionally believed to have a bank based economy, bank finance has contributed only 12 % which is lower that that of the USA (26 %). This small contribution of bank finance in Germany is supported by Mayer (1990) and Edwards and Fischer (1994).

The third observation is that securities markets are an insignificant source of finance. Although stock markets are well developed in UK and USA, Mayer's findings indicate that they have made negative contributions to corporate financing. In this case, it implies that the corporate sectors in these countries have been net purchasers of equity.

Mayer (1990) extends this study by including Canada, Finland and Italy to the sample. Bank finance is more important in Japan, France and Italy, while bond finance represents a significant proportion of finance in Canada (6 %) and USA (10 %). The results of Mayer are also supported by Corbett and Jenkinson (1998) who have investigated the patterns of finance in UK, USA, Germany and Japan. Internal finance is found to be the dominant source of funds. For the period 1970-1994, 93 % of UK corporate financing came from retained profits while it was 96 % for USA. However, these retention ratios were relatively low in Germany (79 %) and Japan (70%). The

contribution of bank finance in German (12%) is less than in Japan (27%) and UK (15%) but almost similar to USA.

Corbett and Jenkinson (1998) also analyse how the financing in different countries has evolved over time. The most notable features are that internal finance has slowly risen in Japan and the United States, but cyclical trends are observed in Germany and UK. In the UK, the corporate sector relied heavily on internal finance during periods of recessions than during boom times. Bank finance has been a significant source of finance in all countries especially in the 1970s. For example, in the period 1970-1974, bank finance contributed about 43% to Japanese corporate financing, but has steadily declined to 19,5% for the period 1990-1994. This fall in the role of bank finance seems to have been compensated by retention ratio, which has risen from 59% to 71%.

Financing Patterns in developing countries

As a starting point, it is useful to note that results from studies of financing patterns in developed countries which have been reviewed, are based on only one approach; the Mayer (1988) methodology. In the context of developing countries both the Mayer (e.g Cho, 1995; Cobhan and Subramaniam, 1998) and the Singh-Hammid (e.g. Singh and Hammid,1992; Singh, 1995) approaches have been employed. In this case, the results can then be compared to see the merits of each approach.

The first notable feature is that corporate financial patterns differ across developing countries. This observation is based on the findings of Singh and Hammid (1992), Singh (1995) and Cobham and Subramaniam (1998), who have found that retention, equity and gearing ratios vary from country to country. Singh and Hammid (1992) have analysed corporate financing patterns in developing countries using individual company accounts data from 1980-1988. Their sample includes the 50 largest manufacturing companies listed on the stock markets of India, South Korea, Pakistan, Jordan, Thailand, Mexico, Malaysia, Turkey and Zimbabwe. Their results show that Zimbabwe and Pakistan with retentions of 58,5% and 58,3% respectively, use more internal finance than the rest. For most companies, retention ratios are below 20% for example Jordan, Korea and Thailand respectively financed 15,8%, 12,8% and 17,3% of their investments internally over the period 1980- 1988.

Singh (1995) reaches the same conclusion in an extension of the Singh and Hammid (1992) study. Singh (1995) assesses the robustness of the Singh and Hammid(1992) results by considering 100 largest manufacturing firms (where applicable) and also adding a tenth country, Brazil. Brazilian firms are found to finance their investments almost entirely from internal finance.

The results from Singh and Hammid (1992) also show that although the proportion of equity finance differs across countries, it is a significant source of finance in most developing countries. In Jordan equity finance contributes about 84% in funding the corporate sector, while it is as low as 12% in Pakistan. This is also in line with Singh (1995) who finds that on average equity finance contributes more than 40% of investment financing in developing countries.

With regard to gearing, Singh and Hammid find that South Korea, India and Thailand have relatively high leverages. Corporations in Thailand are the most highly geared at 62% followed by Korean firms at 53%. The least geared firms are found within Malaysia (8%) and Zimbabwe (9%).

A Comparison of Corporate financing Patterns in Developed and Developing Countries

A major drawback in comparing patterns of corporate finance in developed and developing countries is the lack of appropriate data in most developing countries. For example, the available data do not give separate figures for bank loans, bonds and equity finance.[8] As a result Singh and Hammid (1992) and Singh (1995) studies report three sources of finance; internal finance, external equity finance and external debt finance. In this case, bank finance and bond finance are bundled together under external debt finance. However, Cho's (1995) study, being an exception, shows that bank and bond finance contributes 26% and 13% respectively for Korea. Samuel (1996) also reports that about 33% of investment in India is bank financed. This shows that the use of bank finance in developing countries is comparable to those of bank based developed countries (e.g. Japan with 27%).

[8] Cho (1995) and Samuel are exceptions.

A more noticeable feature is that, in general, developing countries rely on internal finance to a lesser extent than developed countries. The other observation is that equity finance is a significant source of finance in developing countries but plays a limited role in those developed countries, which rely heavily on internal finance. Singh (1995) has offered an explanation for why developing countries seem to rely more on equity finance. He argues that government in developing countries have played an important role in the development of stock markets as part of the financial deregulation programme and also as a way to enhance the privatisation process. The end result was a substantial rise in stock market prices and thus implying lower cost of capital to all listed companies. The Samuel's (1996) study support this argument. Equity finance became more important in India after the Indian stock market boom in 1988. For example, equity finance for large firms in 1988 was 18,5 % but was as low as 2,3% and 3,2% in 1986 and 1987 respectively. This empirical finding is contrary to what has been observed in developed countries where the most developed stock markets have been negative contributors to investment finance.

2.2.2.3 Empirical Evidence on Factors influencing Capital Structure

Introduction

There is a huge literature on the empirical determinants of corporate capital structure in developed countries and only a few similar studies in developing countries. These empirical studies have examined the capital structure decisions of firms by relating debt policy/ratio to a number of explanatory variables selected to capture the influence of competing theories. Although some studies have examined the determinants of corporate capital structure in general, only a few studies have been designed to test the impact of changes in government legislation, within a country, on firm financial policy. For this reason, these studies have focused on testing one particular theory, while controlling for a number of other variables. In this respect, we intend to review the empirical literature under four groups; those that investigate the influence of tax benefits and bankruptcy costs, the influence of agency costs, the

influence of asymmetry information and the influence of corporate strategy.[9] The problem with this approach is that a variable could be capturing a couple of effects and therefore, could fall into more than one classification. For example, the asset structure variable has been used as a proxy for agency (Jensen and Meckling, 1976), information asymmetry (Myers,1977) and corporate strategy (Jordan et al, 1998) factors. In this case, we will classiffy it under the group in which the original author intends it to capture.

Tax and bankruptcy factors

Corporate tax rate

Modogliani and Miller (1963) have shown that interest tax deductions reduce the corporate tax bill and for this reason, the corporate tax rate is positively related to debt ratio. However, the computation of a variable to capture corporate tax effect has not been easy and has often been a source of controversy among researchers (for example, see Graham, 1996). In most countries, the corporate tax rate is a flat rate across industries and firms. Furthermore, in other countries the corporate tax rate has been constant for decades. However, in order to assess the impact of corporate tax on firm's capital structure decisions, researchers have been looking for a variable that varies across firms and over time. The most popular proxy has been the ratio of total taxes paid to total taxable income for each firm. The empirical results to date are inconclusive. Homaifar *et al* (1994) and Jong and Dijk (1998) find supportive evidence of Modigliani and Miller (1963) proposition that the corporate tax has a positive impact on debt usage. On the other hand, the findings of Wansely *et al* (1996), Krisma and Moyer (1996) and Hussain (1995) suggest that the corporate tax rate has an adverse effect on debt usage.

Non- debt tax shields

DeAngelo and Masulis (1980) argue that marginal tax interest deduction is not the only way to reduce the corporate tax bill. Depreciation, tax carry-forwards and investment tax credits can also shield the corporate income from tax payment. For this reason, leverage is hypothesised to be inversely related to non-debt tax shields like depreciation, tax carry-forwards and investment credits. The empirical studies have

[9] This approach is similar to Harris and Raviv (1991) and Prasad *et al* (2001)

found weak evidence to support the prediction that non-debt tax shields are substitutes for tax benefits of debt financing. Wansely *et al* (1996), Benett and Donnelly (1993), Wiwattanakantang (1999) and Saa-Requej (1996), all find evidence to support the DeAngelo and Masulis (1980) hypothesis, while Mackies-Mason (1990) and Boyle and Eckhold (1997) find significant evidence that non-debt tax shields lead to higher debt usage.

Firm size

The theoretical literature argues that large firms are more diversified and hence are less likely to be in a state of financial distress. In addition, large firms can easily access both credit and capital markets. In this case, easy access to credit markets supports the argument that larger firms are more geared than the small ones, while easy access to the capital markets suggests that small firms rely more heavily on debt financing. The empirical findings of Homaifar *et al* (1994), Rajan and Zingales (1995) Firth (1995), and Saa-Requejo (1996), provide evidence to support the predictions of the optimal capital structure that large firms are unlikely to experience financial distress and are therefore capable of maintaining high debt levels. The results can also mean that large firms have easy access to credit markets. The only exceptional study that finds a negative relationship is that of Titman and Wissels (1988). Their study employs the natural logarithm of sales as a proxy of firm size and 6 measures of capital structure; the ratio of short-term, long-term and convertible debt to market and book values of equity. Using the LISREL methodology, the results show that there is a negative and significant relationship between firm size and the ratio of (i) short-term debt to market and book values of equity, (ii) long-term debt to book value of equity. Commending on the negative significant relationship between firm size and long-term book debt *visa avis* the insignificant relationship between firm size and long-term market debt, Timan and Wissels (1988, p 14) state that, " This finding may be due to the positive relationship between our size attribute and the total market value of the firm. Firms with high market values relative to their book values have higher borrowing capacities and hence have higher debt levels relative to their books. Thus, rather than indicating a size effect, we think that this evidence suggests that many firms are guided by the market value of their equity when selecting their long-term debt levels."

Profitability

The trade-off hypothesis suggests that firms with high current cash flow should have easy access to credit markets (Rajan and Zingales, 1995) and in addition the optimal capital structure theory predicts that profitability greatly reduces the probability of bankruptcy/financial distress. Therefore, profitability is hypothesised to be positively related to debt usage. However, the pecking order theory suggests that internal finance is preferred to equity finance. Thus profitability is hypothesised to be inversely related to leverage. The empirical findings of Rajan and Zingales (1995) and Wiwattanakang (1999), among others, support the pecking order view.

Firm risk

In general, firms with unstable cash flows have a greater chance of being unable to honour their debt payments. In this case, there should be an inverse relationship between volatility of firm earnings and leverage. However, firms in financial distress may find it difficult to raise equity finance such that debt usage becomes positively related to earnings volatility. Moreover, earnings volatility encourages firms to use more debt since stockholders gain if the project is successful and stockholders and debtholders share losses if it fails. Jensen *et al* (1992), Saa-Requejo (1996) and Chen and Choi (1999), among others, have found a significant inverse relationship between debt usage and firm risk. Therefore, firms with high levels of earnings volatility tend to use less debt than those with stable earnings.

Agency factors

The agency cost models emphasise the potential conflicts of interests between managers, equity holders and debt holders as the major determinants of firm performance and argues that debt financing, to some extend, can mitigate this problem. However, debt policy is not the only agency-cost reducing mechanism available. Managerial and institutional stock ownership have been considered to be the major subsititutes for debt policy. If this is true, then there is a strong negative relationship between debt policy and managerial and institutional stock ownership. Furthermore, the nature of board of director composition, shareholder concentration and asset structure also have an important influence on capital structure. What follows

is a summary discussion of the nature of the relationship between these factors and debt policy and the empirical evidence.

Managerial Ownership

The theoretical model of Jensen and Meckling (1976) has shown that increasing managerial ownership reduces the agency problem since high managerial stock ownership aligns the interests between managers and outside stockholders. In this case, managerial ownership is a substitute for debt such that debt ratio is predicted to be inversely related to managerial stock ownership. However, increasing managerial stock ownership and attempting to avoid diluting this ownership structure, implies that firms should resort to debt financing when new finance is required. For this reason, there is a positive relationship between debt ratio and managerial ownership. Thus, debt is a complement for managerial ownership. However, the other line of argument postulates a negative relationship. Jensen *et al* (1992) argue that if managers (insiders) are major shareholders in the companies they run, investing elsewhere becomes infeasible and hence they end up with less diversified portfolios. In this respect, they have an incentive to reduce risk by reducing debt levels of the firm they run. Friend and Lang (1988) argue that the presence of high debt ratios in the firm's capital structure is against management self-interest and therefore firms with high managerial ownership are hypothesized to have lower debt levels. In most empirical studies the percentage of equity shares held by insiders (officers and directors) has been employed as a proxy for managerial ownership. Wansely's *et al* (1996) study find evidence to support the hypothesis that increasing managerial ownership will lead to an increase in debt usage as firms seek more finance. However, the results from the studies by Firth (1995), Jensen et al (1992), Barthala *et al* (1994) and Friend and Lang (1988) show that managerial ownership is a substitute for the use of debt financing as a monitoring device. Cruthley and Jensen (1996), Jahera and Lloyd (1996) and Wiwattanankatang (1999), however, do not find a significant relationship between capital structure and managerial ownership.

Institutional Stock Ownership

Institutional investors, through their research capabilities, can monitor managerial activities better than individual investors (Crutchley and Jensen, 1996). In addition, Chaganti and Damanpour (1991) argue that large institutional equity holding limits

the flexibility of moving funds from one firm to another and therefore compels institutional investors to be actively involved in firm decision making. Since institutional investors are active monitors of managerial behaviour, institutional ownership is therefore, hypothesized to be inversely related to firm leverage. Firth (1995), however, argues that institutional investors may limit management's ability to reduce the level of debt in the firm's capital structure. Thus, a positive relationship between institutional stock ownership and the debt ratio is predicted. The agency theory also suggests that institutional investors have well diversified portfolios such that they can tolerate the use of higher debt levels in capital structures. Therefore, institutional stock ownership is positively related to debt usage. The proxy variable that has been used to capture the influence of institutional ownership is the percentage of equity shares held by institutions. For the few studies that have examined the impact of institutional stock ownership on debt usage, Crutchley and Jensen (1996) and Bathala *et al* (1994) find evidence to support that institutional stock ownership reduce the need for debt financing as a monitoring device. This implies that institutional investors are active monitors of managerial behaviour. Firth (1995), however, find a positive relationship between capital structure and institutional stockholding, implying that institutional investors constrain the ability of management to reduce the level of debt in the capital structure.

Shareholder Concentration

Large shareholders are effective monitors of management (Shleifer and Vishny, 1986). They have the incentive to actively monitor managerial activities since the benefits of doing so are greater than the associated costs. In the case of dispersed ownership, monitoring managerial behaviour is costly due to the free rider problem. For this reason, high ownership concentration reduces the need for debt financing as an agency cost reducing device. Thus, ownership concentration is inversely related to firm leverage. Mehran *et al* (1999) and Wiwattanakantang (1999) have used four measures of ownership concentration; percentage of equity shares held by the largest (i) individual shareholder, (ii) corporation, (iii) financial institution and (iv) five shareholders. In the Wiwattanankantang (1999) study, the estimated coefficients of the first three proxies are found to be highly significant and of the expected signs. Thus it can be concluded that large shareholders in Thailand are effective monitors of

management. Firth's (1995) study provides more supportive evidence of the positive relationship between institutional stock ownership and debt ratio.

Board of directors

The role of the board of directors is to safeguard the interests of shareholders by monitoring management performance especially the chief executive officer. The board should be actively involved in monitoring and planning for the future of the company. However, sometimes the board size could be too small or too big to effectively perform its duty, such that debt financing is used, instead, to control managerial behaviour (Lipton and Lorsch, 1992). This suggests that there is an optimal board size for each firm and if the actual board size is above or below this optimal size, then more debt in the firm's capital structure is required to monitor management. Therefore the actual relationship between debt ratio and board size is indeterminant. Wittanakantang (1999) and Wen *et al* (2002) do not find a significant relationship between board size and firm leverage. However, Wen *et al* (2002) report a negative relationship between board composition (% of outside directors of the board) and leverage and thus suggesting that outside directors actively monitor firms' activities.

Asset Structure

Before a loan is advanced to a firm, the lender first assesses the nature of the investment project, in particular the firm's business, risk and its expected future cash flows. The terms and conditions of a loan, together with the interest rate charged all depend on these factors. But once a loan has been advanced, managers may substitute riskier investments for less risk ones (Jensen and Meckling, 1976). This asset substitution problem is harmful to lenders if the project fails and in order for lenders to protect their interests, they ask for loan covenants and provisions. In turn, loan covenants and provisions limit managerial discretion and therefore affect company performance. However, the asset substitution together with the loan covenants and provisions problems can be greatly reduced if assets could be used as collaterals. For this reason, firms with collateralizable (tangible) assets enjoy favourable debt terms than those with less collateralisable assets. To this end, the variable proxing asset tangibility is positively related to firm leverage, while the proxy for intangible assets is negatively related to firm leverage. The measures of collateral value that have been

employed in the empirical literature are; the ratio of tangible assets to total assets and the ratio of intangible assets to total assets. The empirical findings of Friend and Lang (1988), Jensen *et al* (1992) and Chen *et al* (1996) provide strong evidence that is consistent with the predictions of the asset structure argument. That is, tangible assets enhance the borrowing capabilities of a firm. However, Firth (1995) and Krishnan and Moyer (1996), although they find a positive relationship, the coefficient of the tangibility measure is insignificantly different from zero. There is also strong evidence to suggest that intangible assets cannot support high debt levels (Jensen *et al* 1992, Bathala *et al* 1994 and Jahera and Lloyd, 1996). Crutchley's *et al* (1996) results, however, suggest that intangible assets are positive predictors of leverage. They argue that this result is due to their measure of asset intangibility (change in R & D), which might be proxing growth.

Firm Growth Opportunities

In the agency cost framework, firm growth opportunities exasperates the agency problem. The incentive to transfer wealth from debtholders to equityholders is more pronounced for high growth firms. This implies that firms with high growth opportunities find it difficult to attract bondholders. In addition, the Jensen (1986) model suggests that firms with high growth opportunities do not need debt as a monitoring device. It is therefore, expected that growth is inversely related to leverage. The empirical results to date are mixed. The findings of Krishnan and Moyer (1996) and Chen and Choi (1999) are supportive of the optimal capital structure hypothesis that firm growth has a positive impact on capital structure. Firms with high growth rates, therefore, have the capacity to service high debt levels than those with low growth rates. On the other hand, Friend and Lang (1988) and Homaifar *et al* (1994) find evidence to suggest that firms with high growth rates use less debt. These results are consistent with the hypothesis that firms with high growth opportunities find it difficult to attract debtholders. However, Boyle and Eckhold (199) and Bennet and Donnelly (1993) do not find any significant relationship between leverage and firm growth opportunities.

Asymmetric Information factors

The capital structure theory based on information asymmetry does not suggest as many empirical factors as the previous two. Profitability and dividend payments are the most two factors determining capital structure when information between owner managers and investors is asymmetric. The pecking order hypothesis, first proposed by Donaldson (1961) and extended by Myers (1984) and Myers and Malijuf (1984), is at the heart of the asymmetric information theory. Asymmetric information limits the firm's access to external financing and the problem is more severe when accessing equity finance rather than debt finance. The decision to issue new shares is interpreted as bad news about the firm by potential investors who respond by undervaluing the shares. This adversely affects the firm's relative cost of capital. In addition, transaction costs (e.g. reporting requirements) are generally greater for issuing new equities than debt finance. However this does not mean that debt finance is without costs (present costs of debt finance). A cheaper alternative source of finance available to profitable firms is retained earnings. To this end, the pecking order hypothesis predicts that the firm will meet its financial needs by considering (firstly) internal finance, (secondly) external debt finance and (lastly) external equity finance. Baskin (1989) argues that the tax system (in USA) in conjunction with dividends payments also motivate the pecking order behaviour. Issuing shares drives up dividends, which in turn raise personal tax payments.

Testing the pecking order theory has been carried out in conjunction with the predictions of the optimal capital structure theory. One strand of literature relates debt ratios to current and past profitability (e.g. Baskin, 1989; Allen, 1993). Profitability of the firm determines the availability of internal resources to meet the firm's cash needs (for investment and dividend payments). In this case, profitable firms should seek less external finance and thus, all other things being equal, leverage is inversely related to profitability. This is contrary to a positive relationship postulated by the optimal capital structure theory. The Baskin (1989) and Allen (1993) studies are devoted to testing this relationship. Baskin (1989) further argues that past dividend payments could adversely affect the availability of internal finance. Sticky dividend policy compels a firm to seek external finance in order to maintain the same level of

dividends and to meet other future cash needs of the firm, especially new investment opportunities. For this reason, a positive relationship between debt usage and (past) dividends supports the pecking order hypothesis.

Empirical studies discussed above have shown that profitability is inversely related to debt ratios and thus supporting the predictions of the pecking order hypothesis. However, the Baskin(1989) study was wholly devoted to testing the pecking order theory. The sample consists of 378 large public US firms spanning over the period 1960-1972. The debt ratio is first regressed on profitability (in 1972, 1970 and 1965) and growth (ratio of invested capital in 1972 to its value in 1965). The coefficients of all three measures of profitability are negative and highly significant. The results show that, on aggregate, an increase of 10% in firm profitability will lead to a 20% fall in the firm's debt ratio. The second regression equation assesses the influence of dividend payment in 1965 on firm's debt levels in 1972. The coefficient of the dividend measure is found to be positive and significant, implying that firms, which paid out higher dividends in 1965 borrowed more in 1972.

Allen (1993) replicated the Baskin study using a sample of 89 Australian firms over the period 1954 to 1982. Three regressions are estimated for 1954-1966, 1967-1982 sub-periods and for the whole period 1954-1982. The first regression has five explanatory variables; profitability (in 1965, 1962, 1958 and 1954) and growth. The coefficients on the profitability measures for 1958 and 1954 are negative and significant at the 5% level. Profitability in 1962 is positive but insignificant, while the 1965 profitability is negative and significant at the 10% level. The coefficient for growth is positive but insignificant. The other two regressions report almost similar results and thus rejecting the optimal capital structure hypothesis in favour of the pecking order behaviour. However, the predictions of dividend stickness relationship with debt policy, is not supported by the results. Allen suggests that this may be due to multicollinearity problem rather than a rejection of the pecking order hypothesis.

Claggett (1992) takes a different view on how the two theories differently predict corporate financing behaviour. The optimal capital structure theory predicts that firms in the same industrial classification tend to face the same corporate tax rate and risk. For this reason, there exists an optimal (target) capital structure for the industry.

Claggett argues that if this is correct, then at any point in time some firms will be either above or below this target capital structure. It is therefore suggested that the firms with optimal capital structures will preserve them while the rest strive to reach this optimal capital structure. Indeed, Bowen et al (1982) have found evidence to support the hypothesis that over time capital structures of firms of the same industries converge to their industry capital structure mean. On the contrary, the pecking order theory does not suggest that such targets debt ratios exist. In particular, Claggett argues that according to the pecking order hypothesis, a firm, which persistently attains high profits keeps on reducing its debt ratio and thus moving further and further away from the industry mean.

Using data from 253 US companies representing 13 industrial groups over the period 1979-1988, Claggett (1992) makes use of the Goodman-Kruskal technique to test convergence and pecking order corporate behaviour. In testing the convergence, a two by two matrix is analysed. For each matrix the Goodman-Kruskal gamma (G) and the associated test statistic (Z) are estimated. The hypothesis to be tested is that G is significantly different from zero. Rejection of this hypothesis implies that there is no tendency to move towards or away from industry mean capital structure. A positive (negative) value of G implies convergence (divergence) to the mean. In the case of the pecking order hypothesis, a positive and significant estimate of G supports the predictions of the pecking order theory.

The Claggett (1992) results show that firm debt ratios converge to the industrial mean. However, the adjustment is more pronounced for firms with above industry mean than those with below average ratios. The results also support the predictions of the pecking order theory. Haven et al (1999), using a sample of 256 US firms over a longer period (1974-92) replicates the Claggett's study. The results are consistent with those of Jalilvand and Havis (1984), March (1982) and Claggett (1992). The results from these studies, therefore, show that the optimal capital structure and the pecking order theories coexist.

Shyam-Sunder and Myers (1999) also examine the predictions of the static trade-off model against those of pecking order. The results show that the pecking order model explains corporate financing behaviour better than the static trade-off model. Picking

the results from the best target adjustment regression model shows that the adjustment coefficient (0,41) with R^2 of 25% is significant at the 1 % level. The dependent variable for this model is the change in debt ratio. In the case of the pecking order regression model, the best model reports a pecking order coefficient of 0,85, which is less than the predicted value of 1. However, the explanatory power (86 %) is very high. The dependent variable for this model is gross debt issued scaled by total assets. This implies that the external funding for firms is mainly from debt and thus supporting the pecking order.

Corporate strategy factors

The few studies that have examined the impact of corporate strategy on the firm's capital structure have mainly focused on the effect of asset-specificity, diversification or environment dynamism. From a business strategy perspective, firm specific assets make a firm unique and thus enhancing its competitive advantage. However, these highly specialised firm assets (e.g. R & D) do not have much collateral value and therefore adversely affect the firm's borrowing capacity (Balakrisnan and Fox, 1993). As a result, the influence of asset-specificity on capital structure is the same as the asset structure under the agency theory. In fact, the empirical literature has used the same variable measures for tangibility and intangibility. Since the impact of these factors has been discussed above, in this section we concentrate on the influence of the other two issues.

Barton and Gordon (1987, 1988) argue that the observed corporate capital structures reflect managerial choice. They propose that top management's goals and attitude towards risk have an important influence on the firm's diversification strategy. Risk averse managers normally try to avoid risk by diversifying the operations of the firms. A firm can adopt a related, unrelated or direct entry diversification strategy and each is predicted to have a different influence on firm capital structure. A number of researchers have examined these factors. Barton and Gordon (1988) using a sample of 279 US firms for the period 1970-74 have investigated the influence of managerial values and goals on capital structure. They use diversification strategy measure as a proxy for managerial values and goals. Their empirical results in general provide

supportive evidence of a link between corporate strategy and capital structure decisions. In particular, the findings support the predictions of the theory in two respects; the average debt ratios of single strategy firms were found to be the lowest and those unrelated strategy firms were found to have the highest debt ratios.

Jordan et al (1998) extend this line of research by examining the relationship between capital structure and strategy in the small firm context. The sample consists of 275 small and medium sized enterprises (SMEs) in UK. They distinguish between corporate and competitive strategy variables. Jordan et al (1998) find that in the context of SMEs corporate strategy does not affect capital structure decisions. One measure of competitive strategy (innovation) is found to affect capital structure. It is argued that innovation strategy is firm specific and therefore SMEs pursuing these strategies will find it difficult to attract debt holders. As a result, innovation strategy is inversely related to leverage. However, the other two measures of competitive strategy (differentiation and cost reduction strategies) have no significant impact on capital structure.

Kochhar and Hitt (1998) have examined how capital structure is linked to the nature of diversification. That is, they emphasise the nature of diversification (related, unrelated and direct entry) strategy as a major predictor of debt financing. The sample is for 187 large manufacturing firms in US over the period 1981-86. In a simultaneous equation framework their empirical results show that there is a positive (negative) and significant relationship between change in unrelated (related) diversification and debt financing. This supports the argument that asset specificity is associated with related diversification. The results also support the prediction that diversification through direct entry is financed from private sources (e.g. bank finance). Direct entry exasperates the information asymmetry problem since historical information about the firm does not exist in such cases. Thus, direct entry through direct entry compels firms to rely to a larger extend on private funding.

Simerly and Minfang (2000) argue that the choice of capital structure is linked to a firm's competitive environment (environment dynamism). They argue that firms need to build competitive capabilities in order to survive in a dynamic environment. But firms pursuing such strategies will find debt more expensive because they cannot use their assets as collaterals. In addition, operating in a dynamic environment increases

the chances of business failure and thus making it difficult to attract debtholders. From a transaction cost economics theory perspective, such investments should be financed by equity (Williamson, 1988). Simerly and Mingfang (2000) then suggest that the impact of corporate strategy on capital structure depends on whether the firm is operating in a stable or dynamic environment. This is tested via the relationship between leverage and firm performance in a stable or dynamic environment. Their results, based on a sample of 700 large US firms through 1992, show that leverage has a positive (negative) and significant impact on firm performance in a stable (dynamic) environment.

Summary

To sum up, several firm characteristics have been found, by previous researchers, to be important determinants of capital structure decisions and thus rejecting the Modigliani and Miller's (1958) irrelevance theorem. A summary of these empirical studies is presented in table 2.2 below. It is however; clear from the table that the empirical results are inconclusive since some of the determinants have conflicting effects on capital structure decisions. The conflicting results may be attributable to the following reasons;

First, the theoretical work, derived from competing theories does not always agree on the effects of certain variables. For example, the trade-off theory suggests that profitability has a positive impact on borrowing decisions, whilst the pecking order and the transaction cost theories hypothesise a negative influence.

Second, the theoretical work does not suggest how to measure the determinants of capital structure, and thus the empirical work has relied on proxies. The empirical researchers do not always agree on definitions of proxies and as a result different proxies have been employed in different studies. In some cases, the definitions of these proxies are similar yet measuring different determinants with opposing influence on capital structure decisions. The third reason might be that some of the factors might have different influences in different institutional environments.

Table 2.2. Summary of selected Empirical Studies

Factor	Expected Sign	Theoretical Reference	Empirical Evidence	
			Positive	Negative
Profitability	Positive Negative	Rajan &Zingales (1995) Myers(1984)		Titman & Wissels(1988) Jensen & Meckling (1992)
Size	Positive	Kim & Sorensen (1986)	Firth (1995) Hussain (1997)	Titman & Wissels(1988)
Free cash flow	Positive	Jensen (1986)	Shenoy and Koch (1996)	Lowe, Naughton, & Taylor (1994)
Growth opportunities	Negative	Myers(1977) Jensen (1986)	Krishnan & Moyer (1996)	Homaifar, Zietz & Benkato (1994)
Asset tangibility	Positive	Myers (1977)	Jensen & Meckling (1992) Thies & Klock (1992)	
Risk	Negative	Bradley, Jarrell & Kim(1984)		Mackie-Mason (1990) Saa-Requejo(1996)
Corporate tax rate	Positive	Modgliani and Miller (1963)	Homaifar, Zietz & Benkato (1994)	Krishnan & Moyer (1996)
Non-debt tax shields	Negative	DeAngelo & Masulis (1980)	Boyle & Eckhold (1997)	Wiwattanakantang (1999)
Inflation	Positive	BADM (2001)		BADM (2001)
Bank liquidity	Positive	Dermirguc-Kunt & Maksimovic(1996)	BADM (2001)	
Stock market development	Negative	Dermirguc-Kunt & Maksimovic(1996)		BADM (2001)

BADM: Booth, Aivazian, Demirguc-Kunt, & Maksimovic (2001)

2.3 Review of previous studies on determinants of Dividend Policy

2.3.1 Introduction

Although the literature on the overall issue of dividend policy is vast, few studies have analysed the cross-sectional variations in firms' payout ratios. According to Partington (1989), the studies on dividend policy have addressed two main issues; the impact of dividend policy on firm value and the dividend behaviour in practice. The former issue was initiated by Miller and Modigliani's (1961) seminal work that argues that under perfect market conditions dividend policy does not affect the value of the firm. However, recent theoretical models have demonstrated that market

imperfections such as taxation, information asymmetry and agency costs, to some extent, can influence firm dividend behaviour. Allen and Michaely (1995) and Lease *et al* (1999), among others discuss in detail the theoretical as well as the empirical literature on dividend policy in general. The main aim of the present section is to summarise the literature that has analysed cross-sectional variations in corporate payout ratios.

2.3.2 Theoretical Background

Although the finance literature has argued that taxes, information asymmetry and agency costs affect dividend policy in general, determinants of payout ratios have mainly been derived from the agency theory. Therefore, we will briefly outline the predictions of each of the above theories before discussing the influence of agency cost factors on cross-sectional variations in firms' payout ratios.

The tax system and dividends

Brennan (1970) and Litzenberger and Ramaswamy (1979, 1980), among others, have demonstrated that differential tax treatment of dividends and capital gains should influence firm dividend behaviour. For example if the tax rate on dividends is higher than the tax rate on capital gains, shareholders in high tax brackets will prefer non-dividend paying shares. This may lead to a high demand for non-dividend paying stocks such that share prices of these firms will be higher than their non-dividend paying counterparts. In other words, firms with low payout policies are more valuable than firms with high payout dividend policies. This suggests the following predictions about dividend policy. The first is that firms should avoid paying dividends and issuing shares at the same time, as this will increase the tax burden of shareholders. Second, in order to compensate for high tax rates on dividends, shareholders will demand high pre-tax returns for company shares with high dividend yields. Third, share prices fall on the ex-dividend day by less the amount of dividend paid. Fourth, share repurchase policy becomes the most preferred method of distributing cash since it has a tax advantage.

Information signalling and dividends

In a world of informationally imperfect markets, Miller and Modigliani (1961) suggest that changes in dividends may convey information from the insiders

(managers) to outsiders (investors). The signalling models of Bhattacharya (1979), Miller and Rock (1985) and John and Williams (1985) predict that dividend increases signal good news about a company's future cash flows while dividend cuts send bad news. This implies that corporate managers aim to smooth dividend payments.

Agency costs and dividends

Agency cost theory suggests that high dividend payouts mitigate the agency problems. Easterbrook (1984) argues that paying dividends continuously reduce the level of retained income and thus forcing dividend- paying companies to source external funds whenever they need additional funding. This has two implications. First, this subjects managers to monitoring by outside professionals. Second, seeking external financing reduces management's ability to reduce the firm's debt level and as has been shown by Grossman and Hart (1982) high leverage forces management to work in the best interest of shareholders. Jensen (1986), further, suggests that high dividend payouts reduce the free cash flow problem. The theory of dividend policy based on agency costs argument, therefore, suggests the following; Dividend payment is an effective way of constraining management's wasteful behaviour. However, where alternative forms of corporate control exist, we expect firms to have low payouts (Dewenter and Warther (1998). Contrary to the tax argument, firms simultaneously pay dividends and raise external finance (Allen and Izan (1992). Leverage is positively related to dividend payments (Lease *et al*, 1999).

2.3.3 The Lintner Model

Lintner's (1956) stable dividend hypothesis is based on two empirical observations; (1) corporate managers have a target payout ratio which is a proportion of earnings and (2) dividend payment slowly adjust towards this target payout ratio. Therefore, from the first observation the relationship between desired dividends D_t^* and earnings E_t in any period can be expressed as,

$$D_t^* = \rho E_t \qquad 2.1$$

where D_t^* is the target/desired dividend payment, ρ is the payout ratio and E_t is earnings. Based on the second observation Lintner hypothesised that in any one year, firms maintain stable dividend payouts by partially adjusting them to the desired level. Thus, the change in corporate dividend payment from year t-1 to t can be expressed as follows.

$$D_t - D_{t-1} = \beta_0 + \delta(D_t^* - D_{t-1}) \qquad 2.2$$

The constant β_0 is assumed to be positive to reflect the reluctance of firms to reduce dividend payment in any year. The parameter δ is the speed of adjustment factor. Substituting equation 1 into 2 we obtain

$$D_t = \beta_0 + \delta\rho E_t + (1-\delta)D_{t-1}. \qquad 2.3$$

Defining $\beta_1 = \delta\rho$, $\beta_2 = (1-\delta)$ and adding an error term, the estimated equation becomes

$$D_t = \beta_0 + \beta_1 E_t + \beta_2 D_{t-1} + \mu_t \qquad 2.4$$

The parameter estimates from the above equation are expected to be positive, from which the adjustment factor and payout ratio can be recovered as $\delta = 1-\beta_2$ and $\rho = \frac{\beta_1}{\delta}$ respectively.

In the empirical literature D_t^* and E_t are respectively defined as dividend and earnings per share.

As shown above, Lintner's econometric specification of corporate dividend behaviour hypothesises the change in dividends to be mainly explained by the current earnings and the lagged dividends. Ryan (1976) estimated the Lintner model using data from 60 British firms over the period 1965-1970. The results show that the payout ratio and the adjustment factor for British firms during that period were 1.01 and 0.184 respectively. The constant was found to be negative and highly significant. Therefore,

Ryan concludes that the estimation results do not support the prediction of Lintner model.

Fama and Babiak (1968) extended the original Lintner model by adding lagged earnings. This model hypotheses a negative sign on the lagged earnings variable and their empirical results strongly support this hypothesis. Their simulation results, however, show that the constant term in the Lintner model is close to zero and as such the model should be estimated without a constant term. Another contribution of Fama and Babiak is that they disaggregated the earnings and dividend variables.

Nakamura and Nakamura (1985) propose a rational expectation model of corporate dividend behaviour as an extension of the Lintner model. Their model differs from the Fama and Babiak variant in the sense that the lagged earnings variable is hypothesised to have a negative coefficient. Nakamura and Nakamura estimated both the rational and Lintner models using data from USA and Japanese firms in various industrial groups. Their results are consistent with the predictions of both models.

Another extension of the Lintner model was proposed by Lasfer (1996), who incorporated tax exhaustion and discrimination variables in the Lintner's original model. In this modified model the desired dividends level D^* is hypothesised to be a function of current earnings, firm's corporate tax (tax exhaustion) and the personal income tax rate of shareholders (tax discrimination). For this model, the signs of tax exhaustion and discrimination variables are expected to be respectively positive and negative. This model was estimated for 108 industrial and commercial British companies over the period 1973-1983. Their estimation results show that the constant has a negative significant coefficient, but other coefficients are consistent with their expectations.

The above literature, therefore suggests that the Lintner model describes well the dividend behaviour of firms operating in developed countries. However, it is not clear whether the Lintner model is applicable to firms in emerging markets.

2.3.4 The determinants of dividend payout ratio

Agency factors

The theoretical literature suggests that dividends can be used to mitigate the agency problems between managers and shareholders. The main argument is that dividend payment reduces the funds available to managers for perquisites consumption and therefore reduces the manager-stockholder conflict (Jensen and Meckling, 1976 Rozeff, 1982). Jensen (1986) also argues that firms with free cash flows should pay higher dividends in order to reduce the free cash flow problem. In addition Easterbrook (1984) argues that high dividends forces firms to source external finance and therefore subjecting managers to active monitoring by outside professionals. Thus, the agency cost theory suggests that where alternative forms of corporate governance do not exist, firms should pay dividends as an effective way of controlling the wasteful behaviour of management. In other words, firms are expected to pay low dividends if alternative ways of reducing agency costs exist. Using a sample of 1000 US firms over the period 1974-1980, Rozeff (1982) investigates the effect of two agency factors on dividend payment. He argues that, " as outside equity holders own a larger share of the equity, they will demand a higher dividend as part of the optimum monitoring package", p254. Therefore he suggests that insider ownership should be negatively related to dividend payout. He also argues that ownership concentration reduces the agency costs and therefore leads to a lower payout ratio. Rozeff then included, in his study, the number of common stock holders as a proxy for ownership dispersion, and this variable is hypothesised to have a positive impact on dividend payment. The empirical results support the hypothesis that firms with higher inside ownership have low payout ratios. Dempsey and Laber (1992) extend the Rozeff study to the period 1981-1987. This period is characterised by lower inflation, stronger economic growth and lower taxes when compared to the period of Rozeff's study period, 1974-1980. However, despite the significant macroeconomic differences between the two periods, they reach the same conclusions as Rozeff and in addition their results also show that the model remains stable over the period 1974-1987. The other studies that have supported the negative relationship between payout ratio and inside ownership are Jensen et al (1992), Hansen et al (1994) and Holder et al (1998).

However, D'Sounza (1999) uses international data to examine the effects of institutional holdings on dividend payment. This variable is used as a proxy for agency cost mitigating factor and is therefore hypothesised to have a negative effect on dividends. The empirical results are consistent with this hypothesis and thus suggesting that firms with significant institutional ownership have relatively low payout ratios. Saxen (1999) compares the dividend policy of regulated and unregulated US firms and argues that regulated firms should have lower agency costs since the regulator acts as a delegated monitor. The empirical findings show that the insider variable is negatively correlated with payout ratio but is insignificant for the regulated sample. This implies that the agency cost variables do not significantly influence the dividend behaviour of regulated firms and thus supporting the hypothesis that dividend payment reduces agency costs.

Leverage

Kalay (1982) suggests that debt service and covenants, to some extent, can limit dividend payouts. The agency theory (Jensen, 1986) also suggests that leverage is a substitute for dividend payout in reducing agency costs. Thus, leverage is expected to exert a negative effect on the payout ratio. However, on the contrary, Easterbrook (1984) theorise a positive relationship. The empirical study by Dutta (1999) supports a positive relationship, while Jensen et al (1992) report a negative relationship. Dalton and Pointon (1995), however, find no significant relationship.

Size

Chang and Rhee (1990) argue that large and mature firms can afford to pay higher dividends than their smaller counterparts because they can easily access capital markets when the need arises. In this case, we expect a positive relationship between firm size and dividend payout ratio. Using industrial level data over the period 1965-1985, Smith and Watts (1992) find a positive relationship between dividend yield and size and thus supporting the view that large firms pay higher dividends than small firms. This hypothesis is also supported by empirical studies that have used firm level data (Gaver and Gaver, 1993, Holder et al, 1998, and Jones and Sharma, 2001). However, using a sample of 38 Indonesian firms, Ang et al (1997) report an inverse relationship between size and payout ratio and thus suggesting that large firms pay lower dividends than small firms. The contradiction in the empirical findings maybe

due to the fact that the Ang's et al (1997) study uses data from a developing country and also uses the payout ratio as the dependent variable.

Growth

A fast growing firm needs to retain a higher proportion of its earnings than a mature one. Rozeff (1982) argues that firm growth (past and future) entails higher investment expenditures such that high growth firms are expected to have low dividend payouts as a way of retaining internal funds and avoiding the costs of external finance. In addition, Jensen (1986) argues that firms with more growth opportunities have lower free cash follows and are therefore most likely to pay low dividends.

The empirical results of Rozeff's (1982) study are consistent with the above predictions. In particular, the dividend payout ratio is found to be negatively related to past and future growth variables. Another study by Hansen et al (1994) of regulated electric utilities also support the hypothesis that high growth firms pay low dividends. Using a sample of 333 US firms Saxen (1999) compares the dividend policies of regulated and unregulated firms. He hypothesises that growth variables do not have a significant influence on dividends of regulated firms since the growth prospects of these firms are largely determined by appointed regulators. Similar to Rozeff's study the empirical results indicate that past growth plays a significant role in explaining the dividend payout of both regulated and unregulated firms. Other empirical studies, however, have suggested the use of investment opportunity set variables (for example market-to-book) as a better proxy for firms' growth opportunities. Such studies include Saxen (1999) Gaver and Gaver (1999) and Jones and Sharma (2001), among others. However, although these studies find a significant negative relationship between dividend yield and investment opportunity set, they do not find a significant relationship between dividend payout and investment opportunity set variables.

Investment

Cash dividends and expenditure on investments are the major alternative uses of corporate profits. Moreover firms with sticky dividends are most likely to cut investment expenditures during times of low profits. This is also consistent with the prediction of the pecking order theory that hypothesises that when investment expenditure is high firms will cut dividends in order to save internal funds to finance

this investment (Haan, 1997). Thus a negative trade-off between dividends and investment is predicted. The study of Haan (1997) involving Dutch firms, supports this trade-off hypothesis. Using a causality-based approach, Mougoue and Mukherjee (1994) investigate the relationship between dividends and investment. Their results suggest that there is a strong bi-directional relationship between dividend and investment decisions. The study by Jensen et al (1992) also indicates that greater investment reduces dividends.

Earnings variability

Annual company loss is expected to have an adverse effect on dividend policy, since cash dividend is legally paid out of profits (current or retained) rather than capital. This implies that firms persistently reporting negative after tax earnings cannot continue to pay dividends. DeAngelo et al (2000) argue that annual loss is a necessary condition for firms with established dividend record to reduce dividends. Lintner's (1956) pioneering study of dividend policy of US firms documents the importance of net income in determining dividend changes. In addition, the empirical evidence provided by Lintner (1956) and Smith (1971) respectively shows that firms' dividend payments are fairly stable and managers would only cut dividends when firms persistently report losses. This suggests that firms with fairly stable earnings have stable dividends and such firms can commit to paying higher dividends with less risk of cutting the dividend in the future. Thus greater earnings variability is expected to have a negative impact on dividend payout. The empirical evidence by Chang and Rhee (1990) and Holder *et al* (1998) support this hypothesis.

2.3.5 Dividend change

Recently, few studies have empirically examined the determinants of a change in dividend policy, especially the decision to pay or not pay and the decision to cut or increase dividend payment. Fama and French (2001) examine the influence of firm characteristics (profitability, growth of assets, market to book ratio and size) on the firm's decision to pay dividends. Their results suggest that profitability and size increase the likelihood of paying dividends but growth opportunities make it less likely that the firm will pay dividends. Thus, the results support the view that profitable firms pay higher dividends while firms with more growth opportunities pay

lower dividends and these results are consistent with the predictions of the pecking order and transaction costs theories as discussed above. Using a sample of 1412 Indian firms, Manos et al (2002) report that free cash flows, size and age increase the probability of paying dividends while growth expectation reduces the likelihood of paying dividends. Thus the results also support the transaction cost argument.

DeAngelo et al (1992) study the determinants of dividend cut for a sample of 167 US firms over the period 19980-1985. During this period 82 firms reduced dividends while 85 did not. Using the discrete choice approach (Logit model), they postulate that the decision to reduce a dividend payment depends on current income, prior year income and future earnings (up to two years after the initial loss). The results indicate that current loss increases the likelihood of a dividend reduction. Dewenter and Warther (1998) also use a logit model to estimate the determinants of the decision to cut dividends for Japanese and US firms. They hypothesise the decision to cut dividends to solely depend on firm's market adjusted stock returns in year t = 0 through t = -3. In this case year t = 0 is the year when firm cuts its dividend payment. The results show that the decision to cut dividend for US firms in year t = 0 depends on firm stock performance in year t = 0, through t = -2. The Japanese sample however, suggests that dividend cut in year t = 0 is tied to firm stock performance in year t = 0 only. This suggests that there is a significant difference in dividend policies of Japanese and US firms.

Charitou (2000) also estimate a logit model for Japanese industrial firms over the period 1990-1994 in order to examine the impact of cash flows, earnings and losses in setting dividend policy. The results show that cash flows, earnings and loss are important determinants of a dividend change in Japan. However, using data from 2963 UK firms over the period 1974-1999, Benito and Young (2001) estimate a random effects probit model to examine the influence of cash flow, leverage, investment opportunities, actual investment and size on the decision to omit and cut dividends. The results show that cash flow, actual investment and firm size lower the probability of omitting a dividend payment while leverage and growth opportunities increase the probability of omitting dividends. They also report that cash flow, leverage, actual investment and firm size have the same impact on the decision to cut dividends. Thus, while the investment opportunities variable increases the probability

of omitting dividends it lowers the probability of cutting dividends. Silva et al (2002) estimate an ordered probit model using data from 221 German firms over the period 1984-1993. The main objective is to examine the influence of past dividends, net earnings and loss on the decision to reduce, maintain and increase dividends. The results show that loss-making firms are most likely to reduce dividends.

In summary the empirical studies on the determinants of dividend change show that large and profitable firms are most likely to have higher payout ratios, while loss-making and high growth firms are most likely to reduce or omit dividends.

2.4 The interaction between financing and dividend policies, a literature survey

Although Modigliani and Miller (1958) and Miller and Modigliani (1961) have demonstrated respectively that, under certain assumptions, investment decisions are independent of financing and dividend policy decisions, the recent finance literature tends to suggest that there is some degree of interdependence among financial policy decisions (see, for example, Jensen et al, 1992 and Noronha *et al*, 1996). The empirical implication of interdependence among financial policies is that estimation of the individual equations without taking into consideration the information provided by other equations in the system is likely to yield biased and inconsistent parameter estimates. Therefore, a few studies have empirically examined the determinants of financial policies in a system of simultaneous equation framework and the results suggest that financial policies are indeed interdependent.[10] However, most of the recent empirical studies are based on US and other developed countries data. In this subsection we will discuss the literature that has analysed the interaction between capital structure and dividend payout.

The theoretical models and empirical evidence on the interaction of financial policies are limited. However, the few studies that have examined the relationship between dividend and financing policies tend to support the hypothesis that these two policies

[10] See Haan (1997), for a recent review of the literature.

are interdependent. Jensen et al (1992) argues that these policies are not only directly related to each other but are also affected by similar firm-specific factors such as profitability, size and growth opportunities. They further argue that the direct relationship between dividend and debt policies is through agency and signalling theories. Rozeff (1982) and Noronha et al (1996) have incorporated the payout ratio into the Jensen and Meckling (1976) agency cost model and have shown that debt and payout ratios are simultaneously determined. The results of Noronha's et al (1996) model are contingent on agency cost theory as suggested by Easterbrook (1984) who argues that high dividend payouts mitigate the agency problems. Easterbrook (1984) argues that paying dividends continuously reduce the level of retained income and thus forcing dividend- paying companies to source external funds whenever they need additional funding. This has two implications. First, this subjects managers to monitoring by outside professionals. Second, seeking external financing reduces management's ability to reduce the firm's debt level and as has been shown by Grossman and Hart (1982) high leverage forces management to work in the best interest of shareholders. Jensen (1986), further, suggests that high dividend payouts reduce the free cash flow problem. The theory of dividend policy based on agency costs argument, therefore, suggests the following. Dividend payment is an effective way of constraining management's wasteful behaviour. However, where alternative forms of corporate control exist, we expect firms to have low payouts (Dewenter and Warther (1998). Therefore, leverage is positively related to dividend payments (Lease et al, 1999). However, in this agency cost framework, if leverage and dividends are alternative forms of controlling agency problems a negative relationship between leverage and dividend payments is hypothesised.

Kalay (1982) suggests that debt service and covenants, to some extent, can limit dividend payouts. Debt and dividend policies can also be related in the sense suggested by the pecking order hypothesis that firms prefer to use internal finance to pay dividends (Adedeji, 1998). Baskin (1989) further argues that past dividend payments could adversely affect the availability of internal finance. Sticky dividend policy compels firms to seek external finance in order to maintain the same level of dividends and to meet other future cash needs of the firm, especially new investment opportunities. Therefore, a positive relationship between leverage and payout ratio is hypothesised, if firms borrow in order to pay dividends.

Table 2.3 summaries previous studies that have examined the empirical relationship between firm leverage and payout ratio.

Table 2.3 Empirical tests of interdependence between financing and dividend policy decisions by means of simultaneous equation systems

Author	Decision modelled	Estimation method	Sample period	Sample size	Sample country	Are policies Independent?
Noronha et al (1996)	Div, Fin	3SLS	1986-88	80	US	No
Mougoue and Mukherjee (1994)	Div, Fin, Inv	VAR	1978-87	100	US	No
Jensen et al (1992)	Div, Fin, Ins	3SLS	1982, 1987	565, 632	US	No
Haan (1997)	Div, Fin, Inv	3SLS	1983-94	146	Dutch	Yes
Switzer (1984)	RD, Inv, Div, Fin	OLS, 2SLS, 3SLS	1977	125	US	No
Johar (1973)	Inv, Div, Fin	OLS, 3SLS	1950-67	1333	India	No
Peterson and Benesh (1983)	Inv, Div, Fin	2SLS, 3SLS, SUR	1975-79	538	US	No
McCabe (1979)	Inv, Div, Fin	OLS, 2SLS	1966-73	112	US	No
McDonald et al (1975)	Inv, Div, Fin	OLS, 2SLS	1962-68	75	France	Yes
Adedeji (1998)	Inv, Div, Fin	OLS, 3SLS	1993-96	244	UK	No

The table shows that only the results of studies that have used data from Dutch and French companies have accepted the hypothesis that leverage and dividend payment decisions are independent. The data from companies operating in US, UK and India suggest that these policies are interdependent and therefore, support the proposition that these policies should be determined in a system of equations.

McDonald et al (1975) employ a 2 SLS procedure to examine the dividend, investment and financing decisions of 75 French firms for each of the seven years over the period 1962-68. The regression results do not support the hypothesis that financing and dividend decisions are interdependent. Using a 2SLS model, McCabe (1979) examine the interdependence between investment, dividend and new debt behaviour of 112 US firms over the period 1966-1973. 2SLS estimates indicate that dividends and investment are inversely related and thus suggesting that both policies

compete for the firm's funds. New debt, on the other hand, is found to be positively related to dividends and investment. Overall, the results support the hypothesis of interdependence among financial policies.

More recent literature has relied on ratios (especially agency variables) as key determinants of financial policies. Jensen et al (1992) consider a simultaneous equation model of dividends, insider ownership and debt ratio based on data from US firms. The three equations were estimated by 3SLS technique and the results strongly support interdependence of firm's financing and dividend decisions.

Noronha et al (1996) apply 3SLS procedure to examine the simultaneous determination of financing and dividend decisions of 80 US firms over the years 1986-88. They hypothesise that agency cost variables, suggested by Rozeff (1982) are empirically relevant to low growth firms with low use of alternative mechanisms for controlling management behaviour. To test this hypothesis, the sample was divided into two main sub-samples: H_A + L_A H_G and L_A L_G. The sub-sample H_A + L_A H_G contains high growth firms with alternative agency controlling devices, while the sub-sample L_A L_G comprises low growth firms without alternative agency controlling mechanisms. The results are in line with their hypothesis, evidence of strong simultaneity between debt financing and dividend paying is reported for the later sample and thus suggesting that financing and dividend policy decisions are interdependent if dividends are used to mitigate the agency problem.

Adedeji (1998) also apply the 3SLS technique to study the interaction of dividends, financial leverage and investment decisions of 224 UK firms over the period 1993-96. The results indicate that dividend payout ratio is inversely related to investment, but positively correlated with financial leverage. The results, however, reject an association between investment and financial leverage. Thus for the UK, there is empirical evidence to suggest that financing and dividend decisions are interdependent.

Most of these studies, however, have neglected one source of endogeneity arising from the correlation of unobservable firm effects with some or all of the explanatory variables. Haan's (1997) study of firm financial behaviour in the Netherlands was the

first attempt to solve both the simultaneity and firm effects in this area of research. The results, however, reject the interdependence between financing and dividend policies hypothesis.

2.5 Summary and conclusions

From what we have discussed in this chapter, both theoretical and empirical studies suggest that firm characteristics are the major determinants of corporate financial policy. Although the empirical studies are inconclusive the main findings suggest that;

- Firms in developing countries rely on internal finance to a lesser extent than those in developed countries.
- Equity finance is a significant source of finance in developing countries
- Internal finance is a significant source of finance in developed countries
- Larger firms have high leverage and payout ratios
- Firms with more tangible assets are highly leveraged
- High growth firms have low leverage and payout ratios
- Firms with more non-debt tax shields borrow less
- Profitable firms have low leverage ratios but high payout ratios
- High risk firms have low leverage and payout ratios
- Firms with high managerial ownership have low leverage and payout ratios
- Firms with high institutional ownership have low leverage and payout ratios
- Highly leveraged firms have low payout ratios

Chapter 3- Data, definition of variables and methodology

3.1 Introduction

The main objective of this chapter is to describe the data set, variables and the methodology employed to empirically examine financial practices of the Zimbabwean corporate sector. The second section of the chapter describes the characteristics of the sample of firms. The third section presents the definitions of the variables selected for the empirical applications and the fourth section introduces and justifies the methodology employed in the subsequent empirical chapters.

3.2 Data description

The data used in this study is obtained from non-financial companies listed on the Zimbabwe stock exchange. The study is based on accounting data obtained from company financial reports (income, balance sheets, cash flow statements and the accompanying notes to the financial statements). Depending on the objectives, three samples were used in the study.

The first objective is to document and compare financial structure and dividend patterns across three regimes (UDI, independence and Reform) and for this purpose we use a sample of 32 non-financial companies listed on the Zimbabwe stock market in 1999. The stocks of these companies must have been listed for at least 25 years and since the study spans over 25 years, the data is balanced. The process of selecting the 32 companies is summarised as follows:

Firms listed on the Zimbabwe stock exchange in 1999	66
Less	
Firms listed for less than 25 years	-28
Less	
Financial firms	-2
Less	
Firms for which annual reports could not be found	-4
Final sample	32

The second objective is to empirically investigate determinants of capital structure and dividend policy of Zimbabwean firms over 5 years (1995-1999) and for this purpose the sample consists of 51 non-financial firms. Since we also estimate dynamic models, the stocks of these companies must have been listed for at least 3 years. The data set is unbalanced in the sense that time series observations for some firms are not available for the entire period of analysis. The process of selecting the 51 companies is summarised as follows:

Firms listed on the Zimbabwe stock exchange in 1999	66
Less	
Firms listed for less than 3 years	-3
Less	
Financial Firms	-8
Less	
Firms for which annual reports could not be found	-3
Less	
Firms reporting in currencies other than Zimbabwean dollars	-1
Final sample	51

The third objective is to compare financial behaviour of holding and no-holding firms. The estimation period is from 1995 to 1999, therefore, the selection process starts from the 51 firms as shown above. From the sample of 51 firms, we aim to classify firms as either holding or non-holding. Holding firms are the firms that consolidate

their annual financial statements while non-holding do not. Four firms out of the fifty-one firms could not consistently be classified as either holding or non-holding, and therefore were deleted from the sample. Eighteen firms could consistently be classified as non-holding and forty-seven as holding. In order to balance the two samples, holding firms were ranked in order of size and the first eighteen (largest) were selected. Thus for the purpose of comparing financial behaviour of holding and non-holding firms the final sample consists of 36 firms, 18 from each group.

3.3 Definition of variables

The previous chapter has discussed theoretical and empirical literature on determinants of capital structure choice. However, definitions of both dependent and independent variables were mentioned in passing. Therefore, the main objective of this section is to discuss how these variables have been defined in the empirical literature from which we draw the definitions of the variables to be employed in the present study. However, it should be mentioned that although some of the definitions might be appealing, data availability might prevent us from using that definition. Our starting point is to discuss how leverage has been defined and then select the definitions that are to be used in the present study. After selecting the definitions of leverage, we will discuss the definitions of five factors: payout, tangibility, tax, size, profitability, liquidity, growth, non-debt tax, stock liquidity and agency factors. These factors have been extensively used in studies of corporate financial policy. Therefore, we need to see, first, how these variables have been defined in the empirical literature and then select the definitions that are appropriate to the Zimbabwean case.

a) Leverage

The definition of the leverage variable has always been a source of controversy. Since it is a ratio, researchers have to decide what to include in the numerator and denominator. In particular, the problem is on whether to use total, book or market measure of equity in the denominator and whether to use total, long term or short-term debt in the numerator. Thus, there are alternative ways of defining both numerator and denominator of the leverage ratio. However, Sweeney *et al* (1997), in their study of

comparing the differences in book and market values of leverage conclude that in cross-sectional studies book values give similar results to market values. Researchers have resorted to using at least two measures of leverage in empirical case studies of capital structure choice.

Bennet and Donnelly (1993) use 6 measures of leverage. The first three measures are total debt, long-term debt and short-term debt scaled by the sum of market equity and total debt, while the second three measures are total debt, long-term debt and short-term debt scaled by total assets. Hall et al (2000) on the other hand used only two measures; short-term and long-term debt scaled by total assets. Chen et al (1998) also use two measures of leverage; total debt scaled by book and market equity. Other definitions of leverage found in the literature are presented in table A.3.1

In this study we use five alternative measures of leverage to examine the capital structure of listed firms in Zimbabwe. The first measure of leverage, *book debt to total assets*, is defined as the ratio of total interest bearing debt to total assets. This is a broad definition of leverage and has been extensively used in the capital structure empirical literature. The second definition, *book debt-equity* is the ratio of total interest bearing debt to book equity. Although few researchers have used this measure in empirical studies, this is the mainly used measure of leverage in Zimbabwe (company reports and stock market reports). The third measure, *book debt-capital*, is defined as total interest bearing debt divided by the sum of book equity and interest bearing debt. Fourth, *market debt-equity*, is defined as the ratio of total interest bearing debt to market value of equity.

Table 3.1(a) Definitions of leverage

Definition		Reference
$\frac{\text{Total borrowing (book value)}}{\text{total assets (book value)}}$	Debt-total assets	Wald (1999), Wiwattanakantang (1999)
$\frac{\text{Total borrowing(book value)}}{\text{Shareholders funds(book value)}}$	Book debt-equity	Browne (1994) Chen et al (1998)
$\frac{\text{Total borrowing (book value)}}{\text{Total borrowing (book value)+ Shareholders funds(book value)}}$	Book debt-Capital	Hirota (1999) Jordan et al (1998)
$\frac{\text{Total borrowing (book value)}}{\text{Shareholders funds (market value)}}$	Market debt-equity	Chen et al (1998) Prasad et al (2001)
$\frac{\text{Totalborrowing(bookvalue)}}{\text{Totalborrowing(bookvalue)+Shareholders funds(marketvalue)}}$	Market debt-capital	Adedeji (1998) Wiwattanakantang (1999)

The final measure of leverage is *market debt capital* which is defined as the ratio of total interest bearing debt to the sum of market value of equity and total interest bearing debt. The definitions of these measures and the references are shown in the table 1.1 (a) above.

b) The determinants of capital structure

We now turn to the definitions of the 11 independent variables. The selected definitions and the references are shown in table 3.1(b).

Payout ratio

All the previous studies have unanimously defined the proxy for dividend payout as a proportion of ordinary dividends to distributable earnings (e.g. Allen and Mizuno, 1989 and Adedeji, 1998) or equivalently dividend per share divided by earnings per share (Gul, 1999). Following this literature, we define the payout ratio as total ordinary dividends divided by earnings attributable to ordinary shareholders.

Rate of Corporate tax

The simplest proxy for corporate tax is the ratio of tax paid to taxable income before depreciation (Jahera, 1996 and Jordan et al, 1998 among others). However, Homaifar, 1994 defined the corporate tax as $\frac{[(\text{tax paid} - \text{differed tax}) + \text{statutory tax rate}]}{\text{before tax cash flow}}$. In this study, we use the simplest definition, thus we define the tax variable as total tax paid divided by earnings before tax.

Table 1.1 (b) definitions of explanatory variables

Definition	Factor	Reference
$\frac{\text{dividends}}{\text{income attributable to shareholders}}$	Payout	Allen and Mizuno (1989) Adedeji (1998)
$\frac{\text{Fixed assets}}{\text{Total Assets}}$	Tangibility	Chung (1998) Colombo (2001) Friend and Lang (1988)
$\frac{\text{Tax paid}}{\text{net income before tax}}$	Tax	Jahera (1996) Wansely (1996)
$\log\left(\frac{\text{total assets}}{\text{GDP deflator}}\right)$	Size	Shuetrim et al (1993)
$\frac{\text{Net profit defore interest and tax(NIBIT)}}{\text{Total assets}}$	Profitability	Firth (1995) Hall et al (2000)
$\frac{\text{current assets}}{\text{current liabilities}}$	Liquidity	Ozkan (2001)
1) $\frac{\textit{value of total assets at beginning of year} - \textit{value of total assets at end of year}}{\textit{Value of assets at beginning of year}}$	Growth	1)Titman and Wissells (1988) Badhuri (2002)
2) $\left(\frac{\text{NIBIT}}{\text{Book Equity}}\right)\left(\frac{\text{Retained income}}{\text{NIBIT} - \text{Taxation}}\right)$		2)Bevan and Danbolt (2002) Okzan (2002)

Definition	Factor	Reference
1) $\frac{\text{Depreciation}}{\text{NIBIT}}$	Non-debt tax	1)Wald (1999) Titman and Wisselss (1988)
2) $\frac{\text{diferred tax}}{\text{total assets}}$		2) Bennet and Donnelly (1993)
$\frac{\text{shares traded}}{\text{market capitalisation}}$	Stock liquidity	
$\frac{\text{total shares held by insiders}}{\text{total number of floated company shares}}$	Insider ownership	Jahera (1996)
$\frac{\text{total shares held by largest single shareholder}}{\text{total number of floated company shares}}$	Largest shareholder	Jong (2001)
$\frac{\text{total shares held by institutional investors}}{\text{total number of floated company shares}}$	Institutional ownership	Bathala et al (1994)

Size

In the empirical literature, firm size has been mostly defined as the natural logarithm of either total assets or sales. Homaifar (1994) and Wansely (1996), among others, have employed the natural logarithm of total assets, while Prasad, *et al* (2001) have used the natural logarithm of sales. Following Shuetrim, et al (1993), we use the natural logarithm of real assets as a proxy for firm size.

Profitability

Firth (1995) and Hirota (1999) have defined profitability as the rate of return on assets, while Krishnan, et al (1996) and Hall et al (2001) have defined it as the rate of return on sales. Consistent with most of the empirical literature, we define profitability as the ratio of net income before interest and tax to total assets (i.e. return on total assets).

Liquidity

Liquidity in the accounting literature can be defined as the proportion of current assets to current liabilities or ratio of current assets less stocks to current liabilities (quick ratio). Both of these ratios have been used in studies of UK corporate financial policy by Adedeji (1998) and Ozkan (2001)[11]. In the Zimbabwean case, figures for stocks are not available for most of the companies; therefore we define liquidity as the ratio of current assets to current liability.

Growth

The most common definitions of firm growth opportunities variables are the rate of growth of assets and/or sales (Titman and Wissells, 1988, Krishnan, 1996 and Badhuri, 2002). Another definition for growth that is becoming more popular is total assets less book equity plus market equity all divided by total assets. In the present study we use 3 proxies for firm growth; rate of growth of total assets (Badhuri, 2002), ratio of total assets less book equity plus market equity, to total assets (Bevan and Donalbot, 2002) and the ratio of net income to book equity multiplied by the ratio of retained income to net income after tax (Green et al, 2002).

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[11] Adedeji (1998) uses quick asset ratio, while Ozkan (2001) employs asset ratio.

Non-debt tax

In the empirical literature non-debt tax has been defined as; 1) the ratio of depreciation to total assets (Titman and Wissel, 1988, Wald, 1999), 2) earnings after tax less tax paid to statutory rate (Titman and Wissel, 1988 and Hirota, 1999), 3) the ratio of investment tax credits to total assets (Titman and Wissel, 1988) and 4) the ratio of differed tax liabilities to total assets (Bennet and Donnelly, 1993)

Stock Liquidity

Homaifar et al (1994) have argued that capital market conditions have an impact on capital structure decisions. They used first differences in natural logarithms of stock prices as proxies for capital market conditions. Our proxy for capital market condition (stock liquidity) is defined as the ratio of value of shares traded per annum to market capitalisation at the end of the year.

Ownership structure/agency factors

The most common form of ownership structures that have been suggested to have an impact on corporate financial policy are percentage of shares held by: insiders (Jahera, 1996), largest blockholder (Jong, 2001), financial institutions, foreigners and family (Wiwattanantang, 1999). The agency factors we employ in this study are ratio of shares held by insiders (managers and directors) to shares outstanding, proportion of shares held by the largest shareholder and the ratio of shares held by all financial institutions to outstanding shares.

3.4 Methodology adopted

3.4.1 Introduction

The objective of this section is to discuss the econometric models that will be used to empirically investigate the determinants of corporate capital structure in Zimbabwe. The nature of the problem requires pooling of cross-section and time-series company data (panel data analysis). A comprehensive discussion of the advantages as well as the limitations of panel data procedure is found in Hsiao (1985, 1986), Maddala (1987) and Baltagi (1995), among others. However, the advantages of using panel data methodology, often cited in the literature, can be summarised as follows:

First, panel data sets are suitable for studying micro units and thus, making it more appealing in our case where we study firm financial behaviour. Second, panel data sets give more data points, more degrees of freedom, reduce collinearity among variables and therefore, produce more efficient estimates than pure cross-sectional or pure time-series data sets. Third, panel data methodology gives the researcher greater flexibility in controlling for the effects of firm heterogeneity (i.e. firm-specific variables) and time-specific variables which could bias estimates if omitted, as the case in pure cross sectional and time series studies. Fourth, panel data sets are well suited for modelling the dynamics of adjustment, such as modelling why a given firm behaves differently at different time periods.

3.4.2 The Static model

Given a panel sample of N companies observed over T periods, the pooled regression equation can be written as:

$$y_{it} = x'_{it}\beta + \mu_{it} \qquad 3.1$$
$$i = 1,2,\ldots\ldots\ldots,N$$
$$t = 1,2,\ldots\ldots\ldots,T$$
$$\text{with} \quad \mu_{it} = \eta_i + \upsilon_{it}$$

Where the subscript i denotes the i -th firm (i.e. the cross section dimension) and the subscript t denotes the t -th year (the time series dimension). For this model the y_{it} is the observation on the debt ratio (dividend payout) for firm i at time t , x'_{it} is a vector of exogenous variables for the i –th firm in the t -th year,β is a vector of slope parameters, η_i represents time-invariant (firm effects) variables and υ_{it} represents the stochastic term.

The assumptions underlying the above equation are

1) $\{y_{it}, x'_{it} : \; i = 1, 2,\ldots\ldots,N; \quad t = 1, 2,\ldots\ldots\ldots T\}$ is a random sample where N is large while T is relatively small,

2) $\{x'_{it}\}$ is strictly exogenous with respect to υ_{it}, implying that there are no predetermined endogenous variables such that $\text{cov}(\upsilon_{it}; x'_{it}) = 0$ for any (t,s),

3) The errors (υ_{it}) take the following classical structure

$$E(\upsilon_{it}) = 0,$$

$$E(\upsilon_{it};\upsilon_{js}) = \begin{cases} \delta_v^2 & i = j, \quad t = s \\ 0 & \text{otherwise} \end{cases}$$

The main estimation problem is that the unobserved firm heterogeneity (firm effects) η_i may be correlated with the regressors (i.e. $\text{cov}(\eta_i; x_{it}') \neq 0$) such that estimating equation (1) by OLS estimator gives inconsistent estimates.

However, the econometric literature suggests alternative estimators of (1) that are consistent. In this chapter we briefly discuss 3 estimators that have been widely used in empirical work; OLS in first differences, Fixed effects and Random effects (for details, see Baltagi, 2002).

3.4.2.1 OLS in First differences

OLS in first differences estimator is one way of eliminating the firm effects (η_i) as can be illustrated below;

The first step is to transform the variables as follows

$$y_{it}^{\bullet} = y_{it} - y_{i,t-1},\ x_{it}^{\bullet} = x_{it} - x_{i,t-1},\quad \mu_{it}^{\bullet} = \mu_{it} - \mu_{i,t-1} = \upsilon_{it} - \upsilon_{i,t-1} \qquad 3.2$$

since η_i is time-invariant

Therefore by taking time differences in equation (3.1) we get the transformed equation

$$y_{it}^{\bullet} = x_{it}^{\bullet}\beta + \mu_{it}^{\bullet} \qquad 3.3$$

In this case, $\text{cov}(\mu_{it}^{\bullet}; x_{it}^{\bullet}) = 0$ such that OLS estimation of (2) gives consistent estimates of β.

3.4.2.2 The Fixed effects (Within) estimator

The fixed effects model assumes that the slope coefficients are constant for all firms, but the intercept varies across firms. Thus the differences in firm behaviour are assumed to be captured by differences in the constant terms. In this case the approach

is to estimate β and η_i $(i = 1, 2, ...N)$ by least squares. Thus equation (1) can be estimated as

$$y_{it} = x_{it}\beta + d_i\eta_i + \upsilon_{it} \qquad (3.4)$$

where d_i is a dummy variable that is 1 if observation belongs to firm i, and zero otherwise. For this model it is necessary to test for joint significance of d_i using the standard F or Wald test.

However, if the sample contains thousands of firms it is not feasible to estimate d_i and an alternative method (the within estimator) that sweeps away the fixed effects is used. The first step in deriving the within estimator is to write equation (1) in terms of firm means as follows:

$$y_i^m = x_i^m\beta + \eta_i + \upsilon_i^m \qquad 3.5$$

where $y_i^m = \frac{1}{T}\sum_{t=1}^{T} y_{it}$, $x_i^m = \frac{1}{T}\sum_{t=1}^{T} x_{it}$ and $\upsilon_i^m = \frac{1}{T}\sum_{t=1}^{T} \upsilon_{it}$

and subtracting equation (3.5) from equation (3.1) we get

$$y_{it}^w = x_{it}^w\beta + \upsilon_{it}^w \qquad 3.6$$

where $y_{it}^w = y_{it} - y_i^m$, $x_{it}^w = x_{it} - x_i^m$ and $\upsilon_{it}^w = \upsilon_{it} - \upsilon_i^m$

Applying OLS to equation (3.6) gives the Within estimates which are exactly equivalent to the Fixed effects estimates. The within group estimator is consistent since

$$\mathrm{cov}\left(x_{it}^w ; \upsilon_{it}^w\right) = 0$$

3.4.2.3 Random effects

The random effects estimator is more efficient than the fixed effects estimator if it can be assumed that firm effects (η_i) are randomly distributed across firms.

$$E(\eta_i) = 0$$

$$E(\eta_i ; \eta_j) = \begin{cases} \delta_\eta & i = j \\ 0 & \text{otherwise} \end{cases}$$

$$E(\upsilon_{it}) = 0$$

$$E(\upsilon_{it} ; \upsilon_{js}) = \begin{cases} \upsilon_v & i = j, \quad t = s \\ 0 & \text{otherwise} \end{cases}$$

and $\quad E(\eta_i ; \upsilon_{it}) = 0$

In this case, the generalised least squares (GLS) estimator of Balestra and Nerlove(1966) can be used. An advantage of using GLS estimator is that it is a weighted average of the within-group and between-group estimators and therefore, enables the researcher to extract information from those two variations (Owusu-Gyapong, 1986, Greene, 1997).

The major problem facing an applied researcher is a decision on whether the effect should be treated as fixed or random. In other words, when to use the random effects model rather than the fixed effects model. Several guidelines regarding this problem have been proposed in the econometric literature (see Maddala,1987, Balestra, 1992 and Baltagi, 1995, among others). The arguments for choosing the random effects model in favour of the fixed effects model can be summarised as follows.

First, the random effects model is appropriate when the researcher has some time-invariant observation. In fact, the within-group estimator, by failing to estimate time invariant effects, has been criticised for 'wasting' useful information contained in the relations among individual means (Owusu-Gyapong, 1986). Second, "if individual effects are believed to be related to a large number of non-observable random causes, then the random interpretation is clearly indicated" (Balestra, 1992, p.27). Third, the random effects model is more appropriate when N individuals are randomly drawn from a large population. On the other hand the fixed effects model is an appropriate specification if the sample is closed and exhaustive. Fourth, for panel data sets where N is very large relative to the size of T, the LSDV estimator suffers from an enormous loss of degrees of freedom and thus giving inconsistent parameters. In this case one should use the random effects model. Fifth, "the η_i measure firm-specific effects that we are ignorant about just as the same way that υ_{it} measure effects for the i-th cross-

section unit in the t-th period that we are ignorant about. Thus if υ_{it} is treated as a random variable, then there is no reason that η_i should be not" (Maddala, 1987, p.304). However, most studies are not based on these a priori reasons for the choice of modelling technique. Researchers use the Hauseman test to choose between the random effects and the fixed effects models.

The Hausman test is based on the observation that the Random effects is correct only if the orthogonality assumption that unobservable firm effects are uncorrelated with the exogenous variable is not violated, while the fixed effects estimator is unbiased and consistent even if the orthogonality condition is violated. Therefore the null hypothesis of the Hausman test is that the unobserved firm effects (η_i) and the exogenous variables (x'_{it}) are uncorrelated. The Hausman tests statistic is computed as follows

$$H = \left(\hat{\beta}_{FE} - \hat{\beta}_{RE}\right)' \left[\text{var}\left(\hat{\beta}_{FE}\right) - \text{var}\left(\hat{\beta}_{RE}\right)\right]^{-1} \left(\hat{\beta}_{FE} - \hat{\beta}_{RE}\right) \sim \chi^2_K$$

where K denotes the dimension of slope vector β.

Thus $H_0 : \text{cov}(\eta_i; x_{it}) = 0$

$H_1 : \text{cov}(\eta_i; x_{it}) \neq 0$

The Fixed effects is (a) consistent but inefficient under H_0 (b) consistent under H_1. On the other hand the Random effects estimator is consistent and efficient under H_0, but inconsistent under H_1.

3.4.3 The Dynamic model

The dynamic linear model with exogenous variables and a lagged dependent variable is specified as

$$y_{it} = \phi y_{i,t-1} + x'_{it}\beta + \eta_i + \lambda_t + \upsilon_{it} \qquad (3.7)$$

where, y_{it} is the debt (payout) ratio, x_{it} is vector of exogenous variables (current and lagged), η_i and λ_t are respectively firm and time specific effects. It is assumed that the number of firms (N) for which data is available is large while the number of time periods (T) for which data is observed is small. It is further assumed that firm effects (η_i) are correlated with the lagged debt (payout) ratio, $y_{i,t-1}$ and the disturbances are serially uncorrelated.

For this model $y_{i,t-1}$, a right hand regressor, is correlated with the error term, since it is a function of η_i. Therefore OLS estimator of (6) is biased and inconsistent even if the error term is serially uncorrelated.

Nickel (1981) demonstrates that the within estimator does not remove the correlation between the transformed lagged dependent variable and the error term. Thus the within group estimator is also inconsistent in estimating dynamic panel data models. Bond (2002) argues that parameter estimates from OLS and within estimators are, respectively, biased upwards and downwards. However, instrument variable estimation methods, that mitigate the problem, have been suggested in the econometric literature (see Arellano and Bond, 1991) and the most popular are the Anderson and Hsiao (1981, 1982) first differenced two stage least squares (2SLS) and the Arellano and Bond (1991, 1998) GMM estimators.

The method suggested by Anderson and Hsiao (1981) solves the inconsistent problem, firstly, by taking first differences of equation (6) in order to eliminate the firm effects. This gives

$$y_{it} - y_{i,t-1} = \phi(y_{i,t-1} - y_{i,t-2}) + \beta(x_{it} - x_{i,t-1}) + (\upsilon_{it} - \upsilon_{i,t-1}), \quad t = 2,.....T \qquad 3.8$$

The second step is to use either $y_{i,t-2}$ (instrument in levels) or $y_{i,t-2} - y_{i,t-3}$ (instruments in differences) as an instrument for $y_{i,t-1} - y_{i,t-2}$ since each of these variables is correlated with $y_{i,t-1} - y_{i,t-2}$ but not with $\upsilon_{it} - \upsilon_{i,t-1}$.

The Arellano and Bond GMM estimators use an instrument matrix of the form

$$z_i = \begin{bmatrix} y_{i1}w_1 & \cdots & 0 \\ 0 & [y_{i1}y_{i2}w_2] & \\ \vdots & & \\ 0 & \cdots & [y_{i1}\ldots y_{i,T-2}w_{iT}] \end{bmatrix}$$

where the rows correspond to the first-differenced equations for $t = 3, 4, \ldots T$ for firm i, and exploit the moment condition $E(z_i'\Delta\upsilon_i) = 0$ for $i = 1, 2, \ldots N$.

w_i can take the form $(x_{i1}, \ldots x_{iT})$, $(\Delta x_{i2}, \ldots \Delta x_{it})$, or $(x_{i1}, \ldots x_{i,T-1})$ depending on the assumptions made about x_{it}.

3.5 Summary and conclusion

In this chapter we have described the data set, variables and the methodology to be used in the empirical analysis of corporate financial policy of the Zimbabwean corporate sector. The available data of 32 firms spanning over 25 years will be used for analysing the evolution of financial structure and the dividend pattern over the period 1975- 1999. Since this period is characterised by three dramatically different regimes, this sample of 32 firms will also be used to compare company financial behaviour across the regimes.

Although the finance literature has suggested several different measures of firm characteristics, our definitions will mainly be guided by availability of data. The discussion on methodology highlights that the appropriate econometric models for analysing firm financial behaviour are fixed effects and random effects. If dynamics are introduced in the model then GMM technique of Arrellano and Bond (1991) becomes more appropriate. Therefore in the study we will employ the fixed effects, random effects and GMM estimators to study the financial policy of the Zimbabwean corporate sector and by using the appropriate tests (e.g. Hausman test)

the data will guide us on which estimator to use. The next chapter empirically examines the financial behaviour of the Zimbabwean corporate sector across the three regimes.

Table A.3.1
Alternative definitions of variables as suggested in the literature

Variable	Definition	References
Leverage		
	$\frac{\text{total debt}}{\text{total assets}}$	Friend and Lang (1988) Michaelas (1999) Badhuri (2002)
	$\frac{\text{long-term debt}}{\text{total assets}}$	Firth (1995) Michaelas (1999) Badhuri (2002)
	$\frac{\text{short-term debt}}{\text{total assets}}$	Bennet and Donnelly (1993) Michaelas (1999) Badhuri (2002)
	$\frac{\text{total debt}}{\text{book equity}}$	Jahera (1996) Gul and Kealey (1999)
	$\frac{\text{total debt}}{\text{market equity}}$	Jahera (1996) Gul and Kealey (1999)
	$\frac{\text{total debt}}{\text{total debt + book equity}}$	Hirota (1999)
	$\frac{\text{total debt}}{\text{total debt + market equity}}$	Adedeji (1998) Balakrishman (1993)
	$\frac{\text{long-term debt}}{\text{total assets}}$	Wald (1999) Firth (1995)
	bank loans / book equity	Browne (1994)
	$\frac{\text{long-term debt}}{\text{book equity}}$	Krishman (1996)
	$\frac{\text{long-term debt}}{\text{long-term debt + market equity}}$	Wansely (1996)
	$\frac{\text{long-term debt}}{\text{total debt + market equity}}$	Bennet and Donnelly (1993)
	$\frac{\text{short-term debt}}{\text{total assets}}$	Bennet and Donnelly (1993) Michaelas (1999)
	$\frac{\text{short-term debt}}{\text{total debt + market equity}}$	Bennet and Donnelly (1993)
Tangibility		
	$\frac{\text{fixed assets}}{\text{total assets}}$	Hirota (1999)
	$\frac{\text{sales}}{\text{fixed assets}}$	Krishman (1996)
	$\frac{\text{inventories}}{\text{total assets}}$	Colombo (2001)
Profitability		
	$\frac{\text{pretax profits}}{\text{sales}}$	Hall et al (2000)

Variable		Definition	References
		$\frac{\text{EBIT}}{\text{total assets}}$	Firth (1995)
		$\frac{\text{EBIT} + \text{depreciation}}{\text{total assets}}$	Bevan and Danbolt (2001)
Tax		$\frac{\text{total tax paid}}{\text{EBIT} + \text{depreciation}}$	Jahera (1996)
		$\frac{[(\text{tax paid} - \text{differed tax}) + \text{tax rate}]}{\text{before tax cash flow}}$	Homaifar (1994)
Non-debt tax shield		$\text{EAT} - \left(\frac{\text{tax paid}}{\text{tax rate}}\right)$	Hirota (1999) Titman and Wessel (1988)
		$\frac{\text{depreciation}}{\text{total assets}}$	Wald (1999) Titman and Wessel (1988)
		$\frac{\text{investment tax credit}}{\text{total assets}}$	Titman and Wessel (1988)
		$\frac{\text{differed tax liability}}{\text{total assets}}$	Bennet and Donnelly (1993)
Payout ratio		$\frac{\text{dividends}}{\text{distributable earnings}}$	Adedeji (1998) Allen and Mizuno (1989)
Growth		$\frac{\text{total assets}_t - \text{total assets}_{t-1}}{\text{total assets}_{t-1}}$	Titman and Wessel (1988)
		$\frac{\text{sales}_t - \text{sales}_{t-1}}{\text{sales}_{t-1}}$	Krishman (1996)
		$\frac{\text{total assets} - \text{book equity} + \text{market equity}}{\text{total assets}}$	Ozkan (2002)
		$\frac{\text{market value of assets}}{\text{book value of assets}}$	Ozkan (2002)
		$\left(\frac{\text{NIBIT}}{\text{book equity}_{t-1}}\right)\left(\frac{\text{retained earnings}}{\text{earnings after tax}}\right)$	Green et al (2002)
Size		Log (total assets) Log (sales)	Wen et al (2002) Bevan and Danbolt (2002)
Capital conditions	market	$\frac{\text{stock price}_{it}}{(\text{stock price}_{i,t-1} + \text{stock price}_{i,t-2})/2}$	Jalilvand and Harris (1984)
		$\text{Log } p_t - \log p_{t-1}$	Homaifar (1994)
		$\frac{\text{total value of traded shares}}{\text{market capitalisation}}$	Demirguc-kunt and Maksimovic (1996)

Chapter 4- The Zimbabwean Corporate Sector

4.1 Introduction

The main objective of this chapter is to explore the characteristics of non-financial firms listed on the Zimbabwean Stock Exchange. In the finance literature, firm characteristics have been singled out as the major determinants of corporate capital structure and dividend policy decisions. Therefore, a study of firm characteristics is a pre-request for a better understanding of the determinants of these corporate financial policies.

In this chapter, we first discuss the pattern of corporate boards, share ownership structure and ownership concentration in the Zimbabwean context. In the second section of the chapter, we take up the theme of capital structure and empirically compare capital structure ratios and firm performance across the three regimes discussed in chapter one. In the third section of the chapter, we seek to document the financing patterns of the Zimbabwean corporate sector. A summary of the main findings is then presented in the fourth section.

4.2 Board and Share Ownership Structure

The modern corporation is characterised as having highly diffuse ownership structure such that separation of ownership and control is inevitable. The companies listed on the Zimbabwe Stock Exchange are large corporations employing from 400 to 45 000 people. Dailami and Walton (1989) note that two thirds of these companies are foreign controlled. The management of such companies is vested in the hands of professionals who are often either chartered accountants or holders of MBAs or both. In this case, appropriate governance mechanisms are required to align the conflicting interests of shareholders and owners. It is often argued in the finance literature that management ownership, institutional ownership and the existence of large shareholders mitigate this principal-agent problem. In addition, the board of directors can effectively monitor managerial performance. In this section, we briefly discuss the structure of corporate boards, share ownership and ownership concentration of listed firms in Zimbabwe.

4.2.1 Board structure

The primary duty of board of directors is to safeguard the interests of shareholders. In this case, it is highly recommended that a greater proportion of board members must be outside and independent directors (Monks and Minow, 1995 and Blair, 1995). Outside directors are the people who have no significant relationship with the corporation (blood or business). Thus, " company's lawyers, bankers, debtors, creditors, suppliers, consultants and customers" should not be considered as outsiders (Monks and Minow, 1995 p.202). In addition, the Cadbury Commission (1992) recommends that the chairman of the board should be an outsider, thus separating chairman and chief executive roles. However, in practice it is common to find boards with executive chairpersons and in some instances board members who have significant relationships with corporations. Hence, in such circumstances we expect the board of directors to be ineffective in monitoring management and as proponents of agency theory argue, debt financing can be used as an alternative-monitoring device.

The number of board members of listed non-financial companies in Zimbabwe ranges from 7 to 9 with an average of 70 % being non-executives. In contrast, the boards in USA and UK have an average of 15 and 16 members respectively. It is encouraging to note that by 1999 most of companies (85 %) have clearly separated the chairman and chief executive/managing director roles. Not all directors own shares of the companies they lead, but where they do the company law requires that this should be published in the annual reports. Within the board of directors there are other board committees like the audit committee, remuneration committee, finance committee, nominating committee and the executive committee.[12] Most companies now publish governance reports together with the annual reports, " but like mission statements, vision statements, corporate charter and so on, these governance reports may end up being statements of intent only" (Chiura, 2000 p. 13). Another common feature of boards of Zimbabwean-listed companies is that some directors sit on several boards. This may create problems. For example, a director who sits on the boards of two

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[12] The audit committee reviews reports from the internal and external auditors and other accounting procedures. The remuneration committee is responsible for executive compensation. The finance committee is responsible for investment of company funds. The nominating committee oversees the selection of new board members and the executive committee approves important decisions between full board meetings.

companies with conflicting interests will find it difficult to fairly represent the interests of shareholders of both companies.

4.2.2 Share Ownership structure

Who are the owners of Zimbabwean corporations and how has the pattern of ownership evolved over the past few years? In this section we use data published in company annual reports to examine the corporate ownership structure in Zimbabwe. The published ownership data show percentage shareholding by companies, individuals, insurance companies, pension funds, unit trusts, non-residents, banks, government, and investment, trust and properties companies. Managerial ownership is part of the individual shareholding category.

The results from our sample of listed non-financial firms presented in table 4.1, show that domestic corporate bodies are the largest shareholders. They hold on average 44.4 % of the outstanding shares for the period 1990-1999. Most of these corporate holders are either conglomerates/holding companies or nominees. A holding company is established for the purpose of controlling subsidiaries and affiliated companies in a group of companies. Holding companies constitute 60 % of companies listed on the Zimbabwe Stock Exchange. These companies are large and well diversified. They are the top performers on the Zimbabwe Stock Exchange. The largest is Delta corporation limited with 860.1 million shares and employing 13 028 workers in the year 1999.

Table 4.1 Percentage of outstanding shares held by investors (1990-99)

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*1990-99*
Companies	50	49	58	41	52	33	46	34	34	46	44.4
Individuals	16	12	14	11	9	13	6	9	8	9	10.6
Insurance companies	14	9.1	10	13	8	17	20	15	11	10	12.5
Pension Funds	6	14	8	12	3	3	4	6	10	9	7.3
Non Residents	13	8	5	10	9	10	18	15	17	9	11.5
Banks and Nominees	1	6	4	4	5	19	4	11	9	11	7.3
Investment, trust & prop. Cos	0	0.4	0.4	10	7	2	2	6	2	3	3.2
Government	0.6	2	0	0	6	4	4	4	10	5	3.1

Other domestic corporate bodies form companies for the sole purpose of holding shares. In that case all the paper work and the day-to-day administration of the portfolio is delegated to the nominee. Most of these nominee companies were formed to manage portfolios of foreign investors during the time when foreign ownership was restricted. Insurance companies are the second largest shareholders, holding 12.5 % of equity market shares. Foreign investors and local individuals own 11.5 % and 10.6 % of the equity market shares respectively. The percentage share ownership of pension funds is similar to that of bank nominees, which is 7.3 %. The government hold 3.1 % of the outstanding shares, which is also equivalent to the proportion held by investment, trust and property companies. Therefore financial institutions altogether hold on average 40.4 % of outstanding shares, which is a substantial amount. These financial institutions are the largest shareholders in 23.3 % of non-financial firms in the sample. In comparison to other studies, Wiwattanang (1999) reports that financial institutions held about 8 % of Thai firms in 1996. In 1984, Prowse found that financial institutions in Japan and US owned respectively, 43.3 % and 26.6 % of the outstanding stock of all firms. Therefore, financial institutions in Zimbabwe play a bigger role than in other countries. The results presented in table 4.1 above show that there is no clear pattern of ownership over the past ten years, except that foreign ownership has slightly increased from 5.4 % in1992 to 17.4 % in 1998, but the increase was not all that smooth. As mentioned above, the company law in Zimbabwe requires disclosure of directors' share ownership. Therefore, where directors own shares, this is reported under, 'directors' interests' in the ZSE handbook. Using that data we found that director share ownership for each company ranges from 0 % to 36% with a mean of 3 %.

4.2.3 Ownership Concentration

Table 4.2 shows the values of 10 concentration ratios computed from 1999 figures: the percentage of shares held by the largest shareholder, the percentage of shares held by two largest shareholders, the percentage of shares held by three largest shareholders and so on up to the percentage of shares held by the ten largest share holders. One striking feature of percentages of shares held by the ten largest shareholders is that they rarely change. Thus the 1999 data is representative of the whole period of the study (1990-99).

Table 4.2 Ownership Concentration

	Mean	*Std. Deviation*	*Median*	*Minimum*	*Maximum*
Largest shareholder (CR1)	44.4	20.1	43.2	11.4	99.4
Two largest shareholders	60.2	19.3	60.8	18.3	99.8
Three largest shareholders	67.7	17.3	71.5	23.6	99.8
Four largest shareholders	72.5	15.8	76.7	27.5	99.8
Five largest shareholders	76.2	14.6	79.1	31.1	99.9
Six largest shareholders	78.7	13.7	81.5	33.8	99.9
Seven largest shareholders	80.5	13.1	82.7	36	99.9
Eight largest shareholders	81.8	12.6	83.9	37.6	99.9
Nine largest shareholders	82.9	12.2	84.9	38.9	99.9
Ten largest shareholders	83.8	11.9	85.8	40.26	99.9

The results show that on average, the largest shareholder owns 44.4 % of outstanding shares. In this case the investor has an incentive to monitor management behaviour because he bears about 44% of the benefits and the costs of shirking. On the other hand, the ten largest shareholders own about 84 % of equity market shares and we can therefore conclude that ownership of Zimbabwean non-financial companies, is concentrated in the hands of few individuals and institutions.

4.3 Corporate financial performance across the regimes

The main aim of this section is to investigate whether capital structure ratios and firm characteristics have changed in response to the removal of economic sanctions and government controls. In other words we want to compare capital structure and firm characteristics during repressive and liberalised periods. There are several reasons to believe that firm performance improved after the reform. For example, the transformation of the macroeconomic environment, as discussed in chapter 1, might increase the operation efficiency of the corporate sector. In addition, the liberalisation of financial markets may greatly improve firm accessibility to external finance and therefore promote growth of the corporate sector.

For analysing the effect of the economic structural adjustment programme on corporate financial behaviour, we divide the data into three periods: UDI (1975-1979), independence (1986-1990 and reform (1995-1999). Thus we analyse firm behaviour during the last 5 years of each regime. In this case, we exclude 1980-85 and 1991-94 periods because we take them to be transitional periods. In particular, during the 1980-85 period, Zimbabwe was receiving a lot of foreign aid and this might distort the

results. Moreover, the reform was introduced in sequential form such that we expect that the full impact was felt in 1995.

The approach we adopt in this section is to compare firm performance across the three regimes. We restrict the analysis to 4 characteristics that are considered in the finance literature to be the major determinants of corporate financial policy. These ratios are profitability, liquidity, size and growth. We quantitatively test whether the mean and median of each of these ratios after the reform period are significantly different from UDI and independence periods. For completeness, we also compare performance during UDI and independence periods. We make use of parametric and nonparametric tests, namely t-test and Wilcoxon test, respectively. The results from the parametric (t-test) and nonparametric (Wilcoxon test) tests are reported in tables 4.3 and 4.4 respectively and the definitions of the variables used are shown in table A.4. We now turn to a discussion of the statistical results.

Profitability

We measure the profitability of the corporate sector using return on total assets. This ratio is widely used in the finance literature to evaluate whether assets are profitably employed in the business. In the capital structure and dividend policy literature it is the most commonly used determinant of financing and dividend policy decisions. Return on assets employed is defined as the ratio of income before tax to total assets. It can, however, be shown that this ratio is the product of two other ratios: profit margin and turnover of total assets. Profit margin is the ratio of income before tax to sales, while turnover is the ratio of sales to assets. We also report results from these two ratios.

We first compare the UDI and Independence regimes. The results show that there was no significant improvement in profitability following independence. However, the other two ratios, profit margin and turnover suggest that there was a significant change in profitability after independence. The mean (median) decrease in profit margin is 2.8 (2). However, there was a significant improvement in turnover. The mean (median) of turnover increased by 38 (33).

Comparing company characteristics during UDI and reform periods shows that profitability and turnover improved significantly after implementation of ESAP. The mean (median) in profitability is 7.9% (4.4%) while the change in mean (median) of turnover is 0.41(0.28) times. Finally the results in table 4.3c show that profitability after the reform period is significantly higher than during the independence era.

Liquidity

We also examine whether the liquidity position of the corporate sector, measured as the ratio of current assets to current liabilities, changed following independence and the reform programme. The results suggest that there is a significant increase in liquidity of the corporate sector following the removal of economic sanctions. Furthermore, the liquidity position of firms also increased after the reform programme. Thus, the ability of firms to meet short-term obligations without disrupting normal business operations greatly improved after the reform.

Table 4.3(a) A comparison of firm characteristics across the three regimes (parametric test)

	t-test					
Variable	UDI	Indep	Reform	UDI vs Indep	UDI vs Reform	Indep vs Reform
Profitability	0.1598	0.1641	0.2383	0.346 (0.747)	2.512 (0.066)	2.557 (0.063)
Profit margin	0.131	0.1026	0.1459	3.663 (0.022)	1.266 (0.274)	7.692 (0.002)
Turnover 1	1.2136	1.6005	1.6191	5.013 (0.007)	3.641 (0.022)	0.126 (0.906)
Turnover 2	1.3870	1.9183	2.0922	4.940 (0.008)	3.810 (0.019)	0.683 (0.532)
Liquidity	1.2888	1.3940	1.4814	3.263 (0.031)	6.133 (0.004)	2.503 (0.067)
Size1	5.6988	6.4194	7.3997	20.465 (0.000)	34.776 (0.000)	68.089 (0.000)
Size2	5.6260	6.4705	7.4456	30.568 (0.000)	28.094 (0.00)	22.462 (0.000)
Growth 1	0.116860	0.204835	0.2592	1.601 (0.185)	2.237 (0.089)	3.789 (0.019)
Growth 2	0.116054	0.211453	0.3777	2.610 (0.059)	4.587 (0.010)	1.954 (0.122)

Notes: In parenthesis are p-values

Growth

If the corporate sector has to play a significant role in poverty-reduction, then it must grow rapidly. Moreover, one of the major objectives of the reform programme was to promote the growth of the corporate sector and in order to assess whether this was

achieved we calculated two commonly used ratios: growth in total assets (growth1) and sales (growth2).

Table 4.3(b) A comparison of firm characteristics across the three regimes (non-parametric test)

	Wilcoxon test statistic					
Variable	UDI	Indep	Reform	UDI vs Indep	UDI vs Reform	Indep vs Reform
Profitability	0.1690	0.1659	0.2125	-0.405 (0.686)	-2.023 (0.043)	-2.023 (0.043)
Profit margin	0.1306	0.1080	0.1484	-2.023 (0.043)	-0.944 (0.345)	-2.023 (0.043)
Turnover 1	1.2033	1.5359	1.4792	-2.023 (0.043)	-2.023 (0.043)	-0.135 (0.893)
Turnover 2	1.3980	1.8639	1.7873	-2.023 (0.043)	-2.023 (0.043)	-0.405 (0.685)
Liquidity	1.2715	1.4061	1.4712	-1.753 (0.080)	-2.023 (0.043)	-1.75 (0.080)
Size1	5.7150	6.3969	7.3684	-2.023 (0.043)	-2.023 (0.043)	-2.023 (0.043)
Size2	5.5957	6.4777	7.3775	-2.023 (0.043)	-2.023 (0.043)	-2.023 (0.043)
Growth 1	0.12130	0.21521	0.2350	-1.214 (0.225)	-1.753 (0.080)	-2.023 (0.043)
Growth 2	0.11596	0.21030	0.3675	-1.753 (0.080)	-2.023 (0.043)	-1.75 (0.080)

Notes: In parenthesis are p-values

The results show that the growth rate of the corporate sector (growth2) significantly improved after the removal of the economic sanctions. The mean (median) growth rate (growth 2) increased by 9.5 (9.4) point from UDI to independence. However, the major change occurred from UDI to the reform period where both measures of growth rates significantly improved.

Size

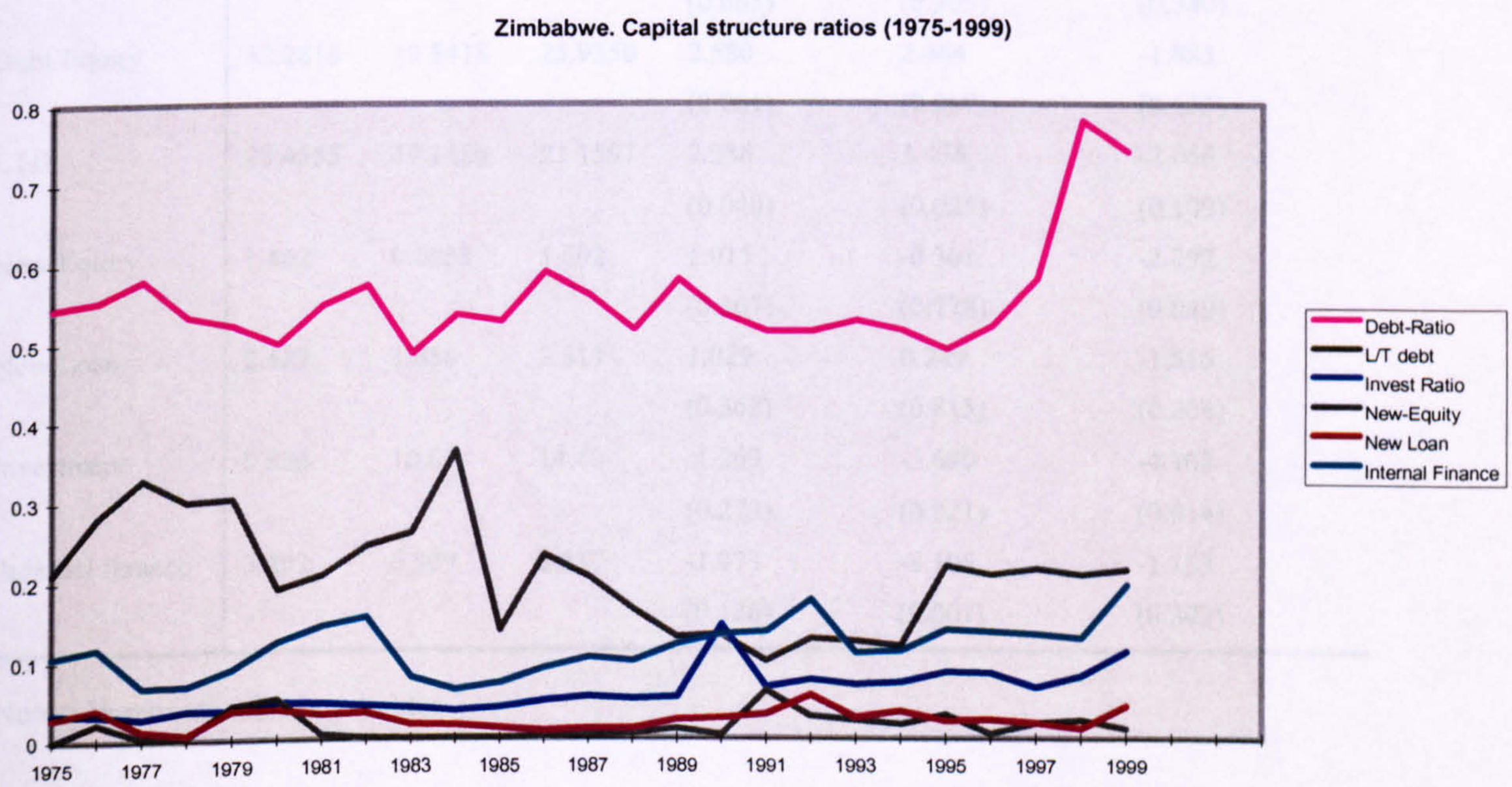
Given the significant changes in firm characteristics, as discussed above, it is perhaps unsurprising that the size of the corporate sector has also significantly increased with time. The results show that the increase in the mean (median) firm size from one regime to the other is significantly different from zero at the 1 % level. Since the profitability of the corporate sector did not significantly improve, we expect the financial sector to play a major role in financing this growth. Therefore, there is need to investigate the role of the financial sector in financing the corporate sector in Zimbabwe.

Capital structure ratios

We first document the evolution of the structure of corporate balance sheets over the period 1975-99 and then empirically investigate whether there was a significant change in capital structure ratios following the implementation of the economic reform programme.

In this section we examine 5 key ratios calculated from company's financial statements. Each of the ratios is calculated as follows: The debt ratio is the ratio of total borrowing to net assets, long-term debt ratio is the ratio of long term borrowing to net assets, new equity ratio is the ratio of new equity issue to net assets, new loan ratio is the ratio of new long term loans to net assets, investment ratio is the ratio of capital expenditure to net assets and internal finance ratio is the ratio of retained earnings to net assets. These definitions are presented in table A4.1. Figure 4.1 below shows the evolution of these ratios over the 1975-99 period.

Figure 4.1



Next we consider whether these ratios have significantly changed over time (i.e. across the three regimes). The statistical results, presented in table 4.4a-b, show that there is no significant change in the total debt ratio across the three regimes. However, long term debt ratio during UDI is shown to be significantly higher than during the other two regimes. The new equity ratio after the reform is also significantly higher than during the Independendence period. We find no statistical evidence of a change in the new loan ratio across the regimes. The statistical results also show that the investment ratio after the reform is significantly higher than during both the UDI and Independence regimes. We also find evdidence to suggest that internal finance significantly increased over time.

Table 4.4(a) A comparison of capital structure ratios across the three regimes (parametric test)

				t-test		
Variable	UDI	Indep	Reform	UDI vs Indep	UDI vs Reform	Indep vs Reform
Debt ratio	54.5890	55.5294	62.1677	-0.469	-1.176	-1.082
				(0.663)	(0.305)	(0.340)
Debt Equity	32.2816	19.8418	25.9350	2.580	2.464	-1.885
				(0.061)	(0.069)	(0.133)
LTD	28.4555	17.1486	21.1597	2.986	3.478	-2.056
				(0.040)	(0.025)	(0.109)
New Equity	1.462	0.6088	1.802	1.015	-0.301	-2.792
				(0.367)	(0.778)	(0.049)
New Loan	2.423	1.650	2.311	1.029	0.249	-1.515
				(0.362)	(0.815)	(0.204)
Investment	8.826	10.67	14.40	-1.269	-3.690	-4.163
				(0.273)	(0.021)	(0.014)
Internal finance	3.292	6.809	8.317	-1.973	-8.108	-1.183
				(0.120)	(0.001)	(0.302)

Notes: In parenthesis are p-values

Table 4.4(b) A comparison of capital structure ratios across the three regimes (non-parametric test)

	Wilcoxon test					
Variable	UDI	Indep	Reform	UDI vs Indep	UDI vs Reform	Indep vs Reform
Debt ratio	54.4334	55.8924	58.0353	-0.674	-0.674	-0.944
				(0.500)	(0.500)	(0.345)
Debt Equity	33.4523	18.1388	25.0773	-1.753	1.753	-1.483
				(0.080)	(0.080)	(0.138)
LTD	29.9495	16.2532	21.2837	-1.753	-1.753	-1.483
				(0.080)	(0.080)	(0.138)
New Equity	0.439	0.4666	1.887	-0.405	-0.135	-2.023
				(0.686)	(0.893)	(0.043)
New Loan	2.801	1.227	2.167	-1.214	-0.135	-1.483
				(0.225)	(0.893)	(0.138)
Investment	8.777	10.10	13.39	-1.214	-2.023	-2.023
				(0.225)	(0.043)	(0.043)
Internal finance	3.336	5.058	8.245	-2.023	-2.023	-0.944
				(0.043)	(0.043)	(0.345)

Notes: In parenthesis are p-values

4.4 The Patterns of Corporate Financing in Zimbabwe[13]

It is widely agreed that the emergence of a dynamic business sector is an important ingredient in the process of economic development in poorer countries. In this respect, a crucial issue is to understand how firms in developing countries finance their activities and how changes in economic policy impact on these financing decisions. However, as Prasad, Green and Murinde (2001) point out, very little is known about company financing decisions in developing countries. Even the basic facts are by no means agreed. The seminal studies of Singh and Hamid (1992) and Singh (1995) utilized company accounts data covering the largest companies in selected developing countries within the International Finance Corporation (IFC) database. They found that, in comparison with firms in OECD countries, firms in developing countries generally utilize a greater proportion of external funding than internal funding and a greater proportion of equity finance than debt finance. Given that capital markets in developing countries are invariably less well developed than in the industrial countries, especially for equities, these findings were surprising. However, Cobham and Subramaniam (1998) argued that the findings were in part an artefact of Singh and Hamid's methodology and sampling, which they claimed biased the statistics in favour of external funding. Concentrating on a single country (India), but using larger samples of companies and a different methodology based on work by Mayer (1988) and by Corbett and Jenkinson (1997), they argued that external and equity funding ratios in India were substantially lower than claimed by Singh and Hamid. A further study of the accounts of large companies in 10 developing countries using the IFC database by Booth, Aivazian, Demirguc-Kunt and Maksimovic (2001) utilized a methodology proposed by Rajan and Zingales (1995), and found that debt ratios varied substantially across developing countries, but overall were not out of line with comparable data for OECD countries.

A partial reconciliation of the different methodologies employed by previous researchers was discussed by Green, Murinde and Suppakitjarak (2001) who also analysed a large sample of Indian company accounts. Their results broadly confirmed Singh and Hamid's findings on external funding ratios but not on debt ratios which,

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[13] This is a revised and extended version of Mutenheri and Green (2003)

like Booth et al (2001), they found to be more in line with OECD data. Crucially however, they found that time- and company-averages could conceal considerable changes in company behaviour. In India, there were measurable, significant changes over time in external funding and debt ratios. Many of these could have been related to the economic reform programmes undertaken in India during the late-1980s and early 1990s, but Green et al (2001) did not test this hypothesis explicitly. It is clearly reasonable to expect that company financing patterns in developing countries will evolve over time as capital markets develop, and in response to any economic reform programmes which may be undertaken. Therefore an essential next step in understanding company financing in developing economies is to examine how far the data are influenced by economic policy changes in different countries.

In this section, we summarise the patterns of corporate financing in Zimbabwe using company accounts data. The main objective of the analysis is to investigate the role of the domestic financial markets, particularly banks and the stock market in financing the Zimbabwean corporate sector in the period 1990-99, just prior to and then following economic reform. Table 4.5 below shows the type of financing, uses and sources of finance for the Zimbabwean corporate sector.

Table 4.5 Financial institutions that provide finance to the Zimbabwean corporate sector.

Type of financing	Use	Sources finance
Short-term finance	Working capital (overdrafts)	Commercial banks
Lease finance	Leasing of capital equipment	Finance houses
Development finance	For Large scale projects	VCC, IDC, ZDB, Sedco, Merchant banks, Commercial banks, CDC, IFC and CSC
Commercial paper	Discount bills	Merchant Banks
Agricultural Finance	Crop, equipment and farm purchase financing	AFC and Commercial banks
Construction Finance	For construction of houses, offices and other dwellings	Building societies
Long-term capital	Equity and loan issues	Zimbabwe Stock Exchange

Notes:

VCC-Venture Capital Company of Zimbabwe, IDC- Industrial Development Corporation

ZDB-Zimbabwe Development Bank , CDC-Commonwealth Development Corporation

IFC-International finance Corporation , SEDCO-Small enterprise development Corporation

AFC-Agricultural finance Corporation, CSC- Cold storage Commission

The data that we use in this section consist of the annual accounts of 51 non-financial companies listed on the Zimbabwe Stock Exchange from its inception in 1946 through 1999, but excluding companies that were either delisted or taken over. The data were obtained from the annual reports of the individual companies and from various issues of the Zimbabwe Stock Exchange Handbook[i].

Table 4.6 shows the gross sources of finance for the 51 sample companies for the period under review (1990-1999). These data were calculated by summing the cash amounts from each source over all companies and then expressing the totals as percentages of gross investment. For 1990-99 as a whole (the rightmost column), the cash amounts were summed over time and then expressed as percentages of the total for 1990-99. This methodology for measuring corporate financial structures is most nearly akin to that proposed by Corbett and Jenkinson (1997) and used by Cobham and Subramaniam (1998) in their study of India.

Since the basic financing choice faced by firms is between internal and external sources, we subdivided the sources accordingly. Internal sources were further subdivided into depreciation and retained profits. External sources were subdivided into long-term and short-term. Long-term finance comprises equity, bonds, bank loans, foreign loans, finance lease, hire purchase, and others. Equity finance is mainly composed of new and rights issues. Bonds consist of preference shares and debentures. Bank loans represent medium and long-term loans provided by the domestic banking sector, mainly commercial banks and the Zimbabwe Development Bank. Foreign loans encompass offshore financing and other foreign loans from institutions such as the International Finance Corporation and the African Development Bank. 'Other' long-term sources consist of loans from domestic non-bank financial institutions, such as pension funds and building societies. Short-term finance comprises bank overdrafts, bank acceptances, trade credit and other short-term sources. 'Other' short-term sources consist of the portion of long-term debt falling due in a year's time and other short-term borrowings not included in the other categories.

Table 4.6. Zimbabwe: Listed Companies' Gross Sources of Finance, 1990-99

(51 companies; in per-cent of total financing)

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*1990-99*
Internal Finance	16.3	17.8	17.7	19.7	28.7	22.9	19.9	17.9	25.3	32.8	24.6
Retained Income	9.4	12.0	10.9	12.9	22.0	14.1	12.0	10.9	18.5	25.8	17.5
Depreciation	6.9	5.8	6.8	6.7	6.7	8.8	7.9	7.0	6.9	7.0	7.1
External Finance	83.7	82.2	82.3	80.3	71.3	77.1	80.1	82.1	74.7	67.2	75.4
Long-term Finance	29.8	37.4	32.0	26.4	24.9	29.3	30.8	34.6	15.4	14.9	23.6
Equity Finance	8.8	17.6	6.4	7.9	7.0	7.6	9.5	20.5	2.7	2.8	7.8
Bonds	0.9	2.7	1.0	0.2	0.2	1.6	0.7	1.8	1.1	0.7	1.0
Bank Loans	2.6	2.0	1.3	2.1	0.9	0.3	1.7	1.8	1.1	0.5	1.2
Foreign Loans	3.0	2.7	2.1	3.2	11.9	10.3	8.9	4.7	2.0	3.8	5.0
Finance Lease	0	0	0	0	0	1.3	1.0	0.4	2.4	0.4	0.9
Hire Purchase	0.1	0	0	0	0	0	1.0	0	2.0	0.3	0.6
Other sources	14.4	12.4	21.2	12.9	4.8	8.2	7.9	5.3	4.1	6.3	7.2
Short-term Finance	53.9	44.8	50.3	54.0	46.4	47.8	49.3	47.6	59.3	52.3	51.8
Bank Overdraft	8.5	8.6	14.7	8.8	8.8	8.7	6.2	7.4	11.5	9.5	9.3
Bank Acceptance	2.6	1.3	1.7	2.6	2.2	1.2	3.2	2.7	4.1	1.3	2.4
Trade Credit	27.3	18.5	24.1	27.1	22.7	23.7	25.7	23.9	35.5	29.3	27.8
Other S/Term Sources	15.4	16.4	9.8	15.5	12.7	14.3	14.2	13.6	8.2	12.2	12.2

Source: Own calculations based on company accounts

For 1990-99 as a whole, external finance contributed 75% of total funds and internal finance provided the remaining 25%. Short-term finance accounted for 52% of external funds with long-term finance contributing the remaining 23%. There were some interesting differences among the different components of *long-term finance.* Equity financing was the most important source of long-term finance at 8%. 'Other' sources of long-term finance (7%) were the second most important source, and foreign loans contributed 5% of external funds. Long-term bank loans and bonds were each a very minor component of total external financing. The most important

source of *short-term* financing was from trade credit, which provided about 29% of the total, with most of the remaining 23% being provided by banks. Table 4.6 shows that there were surges in equity financing in 1991 and 1997 when equities contributed as much as 18% and 21% (respectively) of total financing. The high contribution of the stock market in these years may be related to policy changes involving the raising of barriers to foreign investors. These changes took place in 1991 at the start of the overall economic reform program, and at the end of 1996 when entry barriers to foreign investors were lowered further. Clearly though, the data suggest that the increased use of the equity market which followed these reforms was very short-lived, a phenomenon that was also documented for India in the 1980s by Cobham and Subramaniam (1998). However, Green et al (2002) argued that increased use of the equity market in India in the 1990s was more long-lived.

It is interesting to compare the results from our study with other comparable studies. Singh and Hamid (1992) and Singh (1995) examined the financing patterns in Zimbabwe for the period 1980-89. Exceptionally among the countries they study, their data suggest that internal finance was more important than external finance in Zimbabwe. Our results suggest that Zimbabwean companies relied more heavily on external finance and are therefore more consistent with the other countries studied by Singh and Hamid. The difference between our findings and those of Singh and Hamid are more likely to be due to the different time periods studied than to the different methodologies used, as the Singh method tends to produce a higher share of external financing than ours. Singh and Hamid's data covers the early independence period following the end of UDI when Zimbabwean companies were largely forced to rely on their own resources, whereas our data covers a later period when the economy was more open. This would be consistent with the higher share of external financing that we find. Singh (1995) also reported a much higher share of equity finance in Zimbabwe (43.5%) than we do (8%). This difference probably is due more to methodological differences, as Singh's method does tend to produce a higher share of equity financing than ours. See *inter alia* Cobham and Subramaniam (1998) on these methodological points.

Sub-samples by industrial sector

The Zimbabwe Stock Exchange classifies firms into different sectors of the industry depending on the nature of their businesses. All together, there are 17 sectors, but some sectors contain either one company or none from our sample and therefore it was necessary to leave out such sectors. We were able to analyse 47 companies classified into 9 sectors. The results from the analysis are shown in table A4.2 in appendix 4. There are noticeable differences in financing patterns across industries. Internal finance, at 49 percent, is widely used by firms operating in the agricultural input sector and least used by those in the textile sector, at 16 percent. The contribution of external equity as a source of finance is also most pronounced in this sector. Bank finance was not a significant source of funds in all sectors. It is found to contribute about 2 percent in those sectors with a high proportion of tangible assets like the mining and the industrial sectors.

Trade credit as a source of finance was significant in the agricultural processing and conglomerate industrial sectors, where it accounted for 38 percent and 31 percent of total funds respectively.

Sub-sample by size

Although, all companies listed on the Zimbabwe Stock Exchange are relatively large, they could further be classified as large and small using their net asset values. The net asset values for each company ranged from a minimum of Z$8.7m to a maximum of Z$2 281.5m and the average was found to be Z$396m. We then defined a small company as a company with net asset values less than Z$396m and a large company as a company with net asset values greater or equal to Z$396m. The results shown in table A4.3 suggest that the size of a company has an impact on its choice of finance. Internal finance contributed about 26 percent and 22 percent to financing of small and large firms respectively. Equity finance provided 7 percent and 5 percent to meet the financing needs of large and small firms respectively. The contribution of long-term bank loans was the same, at 2 percent for both small and large corporations. Large firms have better access to foreign loans (6%) than small firms (2 %). Trade credit is more important to small firms (28%) than to larger firms (24%).

Sub-sample by growth

We also classified firms according to each firm's average net asset growth rates, which ranged from –2.35 to 1,5 and the mean growth rate for all companies was 0.34. All firms with mean growth rates less than 0.34 were classified as low growth rate firms, while those with mean growth rates above 0.34 were classified as high growth rate firms. The results from the analysis are reported in table A4.4. These results seem to suggest that firms with high growth rates use more internal, foreign loans and equity finance than low growth firms. On the other hand, low growth firms use more bond finance and bank loans. High growth firms seem to have more access to trade credit and bank overdrafts than low growth firms.

Sub-sample by ownership

As reviewed in the last chapter, it has often been argued in the finance literature that ownership of firms determine firm financial behaviour. It was possible in the Zimbabwean context to identify the ultimate controlling shareholders for all listed companies. These ultimate controlling shareholders, in order of importance, are corporate companies, institutional investors, family, foreigners and the government. Some of these investors are, however, interlinked. For example, corporate companies are foreign controlled and family owners are foreigners, therefore the first three shareholders are interdependent.

The major observation, as reported in table A4.5, is that foreign controlled firms use internal finance and trade credit more than any other firms. The second observation is that long-term loans, at 43 percent, are the most important form of finance to government-controlled firms. Such a high contribution could suggest that other firms are constrained from using long-term loans. The government-controlled firms can use long-term loans to such an extent for three reasons. The first is that no banker can turn down an application for credit by the government, because the debt is secured. The second is that the government is a major shareholder in one of the commercial banks and also the Zimbabwe development bank, therefore state-owned firms can easily get loans from these two institutions. The third reason is that debt finance may be used to align the conflicting interests of management of state-owned enterprises with the owners.

4.5 Summary and conclusion

In this chapter we have examined the characteristics (the board, share ownership structure, ownership concentration, corporate performance and financing patterns) of non-financial firms listed on the Zimbabwean Stock Exchange. The results show that for the period 1990 to 1999 domestic corporate bodies (holding firms) are the largest shareholders. On average they own about 44 % of the outstanding shares. The second largest shareholders are the financial institutions, which own about 40 %. The Zimbabwean government holds the least shares (3.1 %). This implies that holding firms as well as institutional investors play a major role in controlling firms in Zimbabwe. Whether these institutional investors play a major role in capital structure and dividend policy decisions is an empirical issue that will be investigated in the next two chapters.

Using both parametric and non-parametric tests, we also compared capital structure ratios and firm characteristics during the UDI, Independence and Reform periods. We document a significant increase in long-term debt, new equity, internal finance and investment after the implementation of the reform programme. The results also suggest that firm profitability during UDI and Independence. A possible explanation is that both periods were repressive regimes. However, the profitability of firms significantly improved after the implementation of the reform programme. Liquidity, on the other hand, increased significantly from UDI to Independence and from independence to the reform period. Growth and firm size also significantly increased over time.

We finally examined the pattern of financing the Zimbabwean corporate sector and document that firms mainly depend on internal finance, which is 25 % of total financing. Equity finance contributes 8 % of total external financing, while bank finance contributes 1 % of external loans. We also examined the financing pattern of firms after grouping them according to industrial sectors, size, rate of growth and ownership structure. There are two major observations. Firstly, foreign controlled

firms use internal finance and trade credit more than any other firms. Secondly, government controlled firms heavily rely on long-term loans. This observed heterogeneity of firms, needs to be taken into account when investigating financial policy of these firms. The next two chapters will empirically investigate the importance of firm characteristics in determining the corporate capital structure and dividend policy decisions.

Table A4.1 Definitions of firm performance variables

Firm Characteristics	Definition
Profitability	$\frac{\text{income before tax}}{\text{total assets}}$
Profit margin	$\frac{\text{income before tax}}{\text{sales}}$
Turnover 1	$\frac{\text{sales}}{\text{total assets}}$
Liquidity	$\frac{\text{current assets}}{\text{current liquidity}}$
Size1	Log (Total assets)
Size 2	Log (Sales)
Growth 1	$\frac{TA_t - TA_{t-1}}{TA_{t-1}}$
Growth 2	$\frac{Sales_t - Sales_{t-1}}{Sales_{t-1}}$
Capital structure ratios	
Debt ratio	$\frac{\text{Total borrowing}}{\text{Net assets}}$
Debt Equity ratio	$\frac{\text{Total borrowing}}{\text{Net assets}}$
L/Term debt ratio	$\frac{\text{L/term borrowing}}{\text{Net assets}}$
New Equity ratio	$\frac{\text{New issue}}{\text{Net assets}}$
New loan ratio	$\frac{\text{New L/term loans}}{\text{Net assets}}$
Investment ratio	$\frac{\text{Capital expenditure}}{\text{Net assets}}$
Internal finance ratio	$\frac{\text{Retained earnings}}{\text{Net assets}}$

Table A.4.2. Zimbabwe: Listed Companies' Gross Sources of Finance, 1990-99

(in per-cent of total financing), 47 Companies classified according to industry

	Agric. Inputs (4)	*Agric. Processing (8)*	*Conglomerate (8)*	*Construction (6)*	*Consumer (4)*	*Industrial (3)*	*Mining (6)*	*Retail (5)*	*Textiles (3)*
Internal finance	48.8	26.4	17.4	19.4	36.2	17.4	18.7	31.3	15.7
Retained income	42.0	12.6	13.8	12.2	27.8	12.3	10.0	28.2	8.9
Depreciation	6.8	13.9	3.6	7.1	8.4	5.1	8.7	3.1	6.8
External Finance	51.2	73.6	82.6	80.6	63.8	82.6	81.3	68.7	84.3
Long term Finance	26.2	20.0	18.5	29.8	26.0	23.0	35.2	40.2	20.4
Equity Financing	20.2	9.2	6.5	7.9	6.0	2.6	3.3	6.8	6.4
Bonds	0.9	0	0.7	0.2	0	3.2	2.4	2.3	0.7
Bank Loans	0.8	0.3	0.4	0.3	0	1.3	1.9	0	1.1
Foreign Loans	0	4.0	3.1	6.8	1.3	4.9	8.8	9.7	2.7
Finance lease	0	0.9	0.1	0.2	0	1.8	0.1	2.0	0.1
Hire Purchase	0	0	0	0.1	0	0.9	0.7	0.9	0
Other L/term sources	4.3	5.5	7.7	14.3	18.7	8.4	18.0	18.5	9.4
Short Term sources	25.0	53.6	64.1	50.9	37.8	59.6	46.1	28.5	63.9
Bank overdraft	7.8	10.6	9.0	11.1	19.1	13.4	5.5	6.1	4.3
Bank Acceptances	0.5	0.7	2.1	0.6	0.3	8.5	4.0	0	3.0
Trade Credit	15.7	38.2	31.0	24.2	16.3	26.0	20.2	19.9	12.2
Other S/Term sources	1.1	4.0	22.0	14.9	2.0	11.7	16.4	2.5	44.5

Source: Own calculations based on company accounts

Table A4.3 (a). Zimbabwe: Listed Companies' Gross Sources of Finance, 1990-99

(in per-cent of total financing), Large Companies (net assets ≥ Z$4m)

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*1990-99*
Internal Finance	10.6	13.4	14.1	16.5	25.3	19.8	17.7	15.5	22.4	30.8	21.9
Retained Income	5.5	8.7	8.1	11.2	21.1	12.8	11.2	9.7	16.3	24	15.8
Depreciation	5.2	4.7	6	5.3	4.2	7	6.6	5.9	6.1	6.7	6.1
External Finance	89.4	86.6	85.9	83.5	74.7	80.2	82.3	84.5	77.6	69.2	78.1
Long-term Finance	34	42.2	37.6	27.5	37	41.9	36.6	40	15.3	16.1	27.7
Equity Finance	11.4	16.2	7.7	6.5	7	9.1	8.3	20.8	0.5	2.3	7.4
Bonds	0.6	2.8	1.2	0.1	0.2	2.2	0.6	2	1	0.7	1.1
Bank Loans	2.9	2.2	1.1	1.6	1	0.1	1.4	1.8	0.5	0.3	0.9
Foreign Loans	2.2	1.8	1.4	2.8	13.4	12.8	11.1	5.4	1.8	4.4	5.6
Finance Lease	0	0	0	0	0	0	0	0.1	2.9	0.1	0.6
Hire Purchase	0	0	0	0	0	0	1.3	0	2.6	0.4	0.8
Other sources	17	19.1	26.3	16.5	15.4	17.8	13.9	9.9	6	7.8	0.8
Short-term Finance	55.3	44.4	48.3	56	37.7	38.3	45.7	44.4	62.4	53.2	50.4
Bank Overdraft	6.7	8	6.9	7.3	6.9	6.7	4.3	6	9.5	10	7.9
Bank Acceptance	0.5	0.3	0.5	1	0.3	0	3.1	2.2	3.8	0.9	1.8
Trade Credit	25.2	16.3	24	22.8	15.8	18.1	21.7	20.4	34.4	25.9	24.5
Other S/Term Sources	23	19.7	16.8	24.9	14.7	13.5	16.6	15.8	14.7	16.4	16.3

Source: Own calculations based on company accounts

Table A4.3 (b). Zimbabwe: Listed Companies' Gross Sources of Finance, 1990-99

(in per-cent of total financing), small Companies (net assets < Z$4m)

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*1990-99*
Internal Finance	21.6	23.2	22	21.5	26.1	22.4	23	16.9	27.3	34.1	25.6
Retained Income	13.9	16.3	14.7	13.3	15.1	12.6	12.6	9.9	19.9	27.1	17.6
Depreciation	7.8	6.9	7.3	8.2	11	9.8	10.4	7	7.5	7	8
External Finance	78.4	76.8	78	78.5	73.9	77.6	77	83.1	72.7	65.9	74.4
Long-term Finance	23.4	38.6	21.6	21.7	29.2	14.3	20.2	18.4	20.3	17.7	20.3
Equity Finance	1	17.1	2.4	8.7	4	2.8	2.8	9.6	7.3	1.2	5.2
Bonds	1.2	2	0.4	0.4	0.1	0	1	0.6	1.1	0.8	0.7
Bank Loans	1.2	1.1	1.4	2.8	0.4	0.7	1.1	0.3	0.3	0.8	0.8
Foreign Loans	3.7	3.9	3.3	3.3	2.3	2.8	2.2	1.5	2.1	2.2	2.3
Finance Lease	0	0	0	0	0.1	3.4	3.5	1.1	0.7	1.3	1.3
Hire Purchase	0.2	0	0.2	0	0.1	0	0	0	0	0	0
Other sources	16.1	14.4	14	13.9	7.4	10.5	7.6	7.2	8.8	11.3	9.9
Short-term Finance	55	38.2	56.4	49.4	59.6	57.3	58.7	62.8	52.4	48.2	54.1
Bank Overdraft	9.3	8.3	28.4	9.7	10.1	10	10.3	7.9	12.9	7.2	10.3
Bank Acceptance	6.1	2.8	3.8	5.5	6.7	3.1	3.3	2.8	0.7	2.2	2.8
Trade Credit	20.9	19.4	17.5	26.4	31.5	26.9	31.7	22.6	29.9	34.1	28.5
Other S/Term Sources	18.7	7.7	6.8	7.8	11.3	17.3	13.4	29.5	8.9	4.6	12.6

Source: Own calculations based on company accounts

Table A4.4 (a). Zimbabwe: Listed Companies' Gross Sources of Finance, 1990-99

(in per-cent of total financing), High growth Companies (average annual growth rate ≥ 34 %)

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*1990-99*
Internal Finance	11.9	16.7	14	32.2	29.6	19.5	18.4	17.8	22.7	31.1	23.9
Retained Income	6.5	11.6	10	21.4	24.8	13.2	12.5	11.5	17.7	25.3	18
Depreciation	5.5	5	4	10.8	4.8	6.2	5.9	6.2	5	5.8	5.8
External Finance	88.1	83.3	86	67.8	70.4	80.5	81.6	82.2	77.3	68.9	76.1
Long-term Finance	33.6	44	40.2	27.5	32.2	39	38.6	38.8	20.5	19	28.5
Equity Finance	10.4	17.9	10.3	6	5.7	9.6	10.3	17	3.6	2.8	7.4
Bonds	0.7	0.8	0.3	0.2	0.1	0	0	1	0.8	0	0.4
Bank Loans	3.5	3	1.6	1.9	1.4	0.4	1.7	1.5	0.3	0.2	0.9
Foreign Loans	2.8	1.9	2.5	3.8	10.6	10.8	10.5	6.8	2.3	4.8	5.7
Finance Lease	0	0	0	0	0	0	0.1	0.4	3.1	0.2	0.8
Hire Purchase	0.1	0	0	0	0	0	0	0	2.7	0.4	0.7
Other sources	16	20.4	25.5	15.7	14.3	18.2	16	12.2	7.8	10.5	12.6
Short-term Finance	54.5	39.3	45.8	40.3	38.2	41.5	43	43	56.8	49.9	47.6
Bank Overdraft	6.3	6.6	16.8	5.3	7.8	7.3	7.4	7.9	11.6	8.2	8.9
Bank Acceptance	2.7	1.9	1.4	1.8	1.6	0.7	0.7	0.9	0.5	0.1	0.7
Trade Credit	26.3	17.9	22.7	21.3	18.2	22.8	23	22.1	32.8	28.4	26
Other S/Term Sources	19.3	12.9	4.8	12	10.5	10.7	12	12.5	11.8	13.2	12.1

Source: Own calculations based on company accounts

Table A4.4 (b). Zimbabwe: Listed Companies' Gross Sources of Finance, 1990-99

(in per-cent of total financing), Low growth Companies (average annual growth rate < 34 %)

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*1990-99*
Internal Finance	17.2	14.7	20.3	18.2	19.5	18.7	20.4	14.3	26.3	33.2	22.4
Retained Income	10.4	9.6	10.5	10.4	11.9	9.8	10.2	7.7	16.6	24.3	13.9
Depreciation	6.8	5.1	9.8	7.8	7.7	9	10.2	6.6	9.7	9	8.5
External Finance	82.8	85.3	79.7	81.8	80.5	81.3	79.6	85.7	73.7	66.8	77.6
Long-term Finance	26.7	45.7	21.8	22.1	29.8	39.8	20.9	29	8.4	11	21.8
Equity Finance	4.8	13.3	0	7.1	7	1.9	1.5	19.3	0.1	0.3	5.4
Bonds	0.9	3.6	1.8	0.3	0.3	3.3	1.8	2.6	1.5	2.1	1.9
Bank Loans	0.9	13	0.6	1.5	0	18	0.6	1.3	0.7	1.2	2.9
Foreign Loans	2.5	2.8	1.3	1.1	10.4	5.6	5.9	0.6	0.9	1.3	2.8
Finance Lease	0	0	0	0	0	2.7	2.4	0.3	0.2	0.9	0.8
Hire Purchase	0	0	0	0	0.1	0	2.4	0	0	0	0.3
Other sources	17.5	13	18	12.1	12.1	8.3	6.4	4.9	4.8	5.3	7.7
Short-term Finance	56.1	39.6	57.9	59.7	50.7	41.5	58.8	56.7	65.4	55.7	55.9
Bank Overdraft	9.1	8.4	9.2	9.8	7.6	7.3	3.9	5	8	11.4	7.9
Bank Acceptance	1.9	0.4	1.8	2.6	2.4	1.4	6.8	5	8.1	3.9	4.4
Trade Credit	20.7	14.8	20.9	21.7	22.1	14.8	26.8	14	33.7	28.3	23.4
Other S/Term Sources	24.4	15.9	26	25.6	18.6	18	21.2	32.7	15.5	12.2	20.2

Source: Own calculations based on company accounts

Table A4.5 (a). Zimbabwe: Listed Companies' Gross Sources of Finance, 1990-99

(in per-cent of total financing), Firms controlled by holding companies

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*1990-99*
Internal Finance	19.5	21.2	23.2	31.2	40	23.9	28.6	20.6	20.6	34.1	27.4
Retained Income	11.4	13.7	13	20.9	32.2	10.5	14.9	13.1	13.2	26.7	17.9
Depreciation	8.1	7.5	10.2	10.3	7.9	13.4	13.7	7.7	7.4	10.4	9.5
External Finance	80.5	78.8	76.8	68.8	60	76.1	71.4	79.3	79.4	62.9	72.6
Long-term Finance	38.9	42.7	29.7	34.5	35.6	32.1	25.3	26.8	10	10.1	21.9
Equity Finance	13	29.1	13.7	12.6	10.3	5.7	4.9	13.3	5.3	1.3	7.8
Bonds	1.2	0.8	0.5	0.4	0.1	4	0	1.7	0.4	1.2	1
Bank Loans	2.5	1.4	0.4	4.6	1.3	0	2.4	2.4	0.6	1	1.4
Foreign Loans	2	1.3	1.1	5.3	13.3	9.5	8.3	1.3	0.1	1	3.5
Finance Lease	0	0	0	0	0	0	0.2	0.3	0.3	0.6	0.3
Hire Purchase	0	0	0	0	0	0	2.7	0	0	0	0.3
Other sources	20.1	10.1	14	11.6	10.4	12.9	6.8	7.7	3.3	4.9	7.5
Short-term Finance	41.6	36.1	47.1	34.3	24.4	44.1	46.1	52.5	69.4	52.9	50.7
Bank Overdraft	3.8	4.7	26.7	6.5	5.8	7.2	5.4	9.6	12.1	10.4	9.7
Bank Acceptance	0.5	0.5	0	0.4	0.6	0.1	6.2	5	0.5	0.4	1.8
Trade Credit	26	18.7	15.8	18.8	13.1	23.1	22.8	20.9	44.6	29.9	27.4
Other S/Term Sources	11.3	12.1	4.6	8.6	4.8	13.7	11.7	16.9	12.2	12.2	11.9

Source: Own calculations based on company accounts

Table A4.5 (b). Zimbabwe: Listed Companies' Gross Sources of Finance, 1990-99

(in per-cent of total financing), Firms controlled by **Institutional companies**

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*1990-99*
Internal Finance	12.2	11.6	11.8	10.2	16	21.2	13.9	13.9	19.3	22	17.1
Retained Income	7.8	8.8	8.5	7	12.2	17.5	11.3	10.8	14.6	18.6	13.6
Depreciation	4.4	2.8	3.3	3.2	3.9	3.7	2.6	3.1	4.7	3.3	3.6
External Finance	87.8	88.4	88.2	89.8	84	78.8	86.1	86.1	80.7	78	82.9
Long-term Finance	21.7	39.9	34.1	20.5	26.4	35.2	24.6	31.2	12.2	11.2	21.3
Equity Finance	8.7	9.8	1.4	2.9	5.4	11.6	2.9	11.5	1.8	4.2	5.3
Bonds	0.1	4.2	1.4	0	0.3	0	2	1.3	1.4	1	1.1
Bank Loans	0.1	0	0	0	0.1	0.1	0.3	1.4	0.7	0.6	0.5
Foreign Loans	0	1.3	0	0	6.7	8	10	7.9	1.9	0.8	3.8
Finance Lease	0	0	0	0	0	0.6	0.4	0.7	0.5	0.1	0.3
Hire Purchase	0	0	0	0	0	0	0	0	0	0.1	0
Other sources	12.8	24.5	31.3	17.6	13.9	15	8.9	8.3	6.1	4.3	10.3
Short-term Finance	66.1	48.6	54.1	69.3	57.6	43.6	61.6	54.9	68.5	66.9	61.6
Bank Overdraft	10.4	11.6	7.9	8.4	9.9	9.7	5.6	5	11.9	10.6	9.2
Bank Acceptance	0.5	0.2	0.5	8.2	0.5	1.8	1.8	0.8	8.1	3.2	3.4
Trade Credit	26.8	13.3	23.6	23.1	21.5	17.1	29.9	28.2	30.1	30.3	26.9
Other S/Term Sources	28.4	23.5	22	29.6	25.6	15	24.2	20.8	18.4	22.7	22.1

Source: Own calculations based on company accounts

Table A4.5 (c). Zimbabwe: Listed Companies' Gross Sources of Finance, 1990-99

(in per-cent of total financing), Firms controlled by **Families**

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*1990-99*
Internal Finance	15.7	25.6	24.2	16.6	24.4	19.3	14	12.3	33.2	42.9	27.4
Retained Income	10	18.2	13.8	8.1	15.4	10.7	7.7	8.4	28.3	39.3	22.3
Depreciation	5.7	7	10.4	8.5	9	8.5	6.3	3.9	4.9	3.6	5.1
External Finance	84.3	74.4	75.8	83.4	75.6	80.7	86	87.7	66.8	57.1	72.6
Long-term Finance	34	40.5	31	38.4	7.2	21.7	54.2	24	22.7	31	30
Equity Finance	2.5	18.1	0	22.6	0	3.9	27.6	5	0.3	0.6	5.9
Bonds	2.4	0.9	1.7	1.5	0.2	0.1	0	3.4	3.5	0	1.5
Bank Loans	0	1.1	3.7	0	0	0	1.4	0.6	0	0	0.4
Foreign Loans	7.3	6.9	8.6	5.6	1.6	0.9	1.1	4.5	5.1	12.2	6.5
Finance Lease	0	0	0	0	0	8.7	4.8	0.3	0.3	0.9	1.5
Hire Purchase	0.4	0	0	0	0	0	0	0	0	1.6	0.5
Other sources	21.3	13.5	17	8.8	5.5	8.1	19.1	10.2	13.4	15.6	13.6
Short-term Finance	50.3	33.9	44.9	44.9	68.4	59.1	31.8	63.7	44.1	26.1	42.7
Bank Overdraft	7.3	8.7	5	5.5	6.3	8.2	4.9	4.3	7.3	0.9	4.4
Bank Acceptance	3.7	0	7.2	9.5	11.1	0	0	0	0	0	0.9
Trade Credit	14.9	19.5	24	25.8	31.1	19.3	14.9	18.2	26.4	22.5	21.4
Other S/Term Sources	23.3	5.7	8.6	4.1	19.9	31.6	12.1	41.2	10.3	2.7	16

Source: Own calculations based on company accounts

Table A4.5 (d). Zimbabwe: Listed Companies' Gross Sources of Finance, 1990-99

(in per-cent of total financing), Firms controlled by **Foreigners**

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*1990-99*
Internal Finance	8.7	14.3	21.3	28.8	25.6	28	36.3	37.3	36	33.7	32.1
Retained Income	1.4	10.1	15.1	19.5	16	18.4	20.3	17.3	22.9	23.2	20.2
Depreciation	7.3	4.1	6.1	9.4	9.5	9.6	16	20	13.1	10.5	12
External Finance	91.3	85.7	78.7	71.2	74.4	72	63.7	62.7	64	66.3	67.9
Long-term Finance	4.4	28.8	28.3	17.4	12.9	10.4	12.6	15.1	5.6	25.7	16.8
Equity Finance	0	0	15.4	0	0	0.4	0.1	10.1	0	0	1.7
Bonds	0	0	0	0	0	0	0	0	0	0	0
Bank Loans	0	0	0	0	0	1.6	0	0	0	0	0
Foreign Loans	0	0	6.4	3.8	4.2	3.4	7.9	3.1	5.1	2.2	3.8
Finance Lease	0	0	0	0	0	0	0	0	0	0	0
Hire Purchase	0	0	0	0	0	0	0	0	0	0	0
Other sources	4.4	28.8	6.5	13.6	8.8	5	4.5	1.8	0.4	23.4	11.2
Short-term Finance	86.9	56.9	50.4	53.8	61.5	61.7	51.1	47.6	58.4	40.6	51
Bank Overdraft	18.6	13	6.2	13.5	9	7.9	10.8	13.5	10	3.9	8.7
Bank Acceptance	7.8	0	3.8	0	7.9	0	0	0	0	0	0
Trade Credit	30.7	34.6	35.9	39.2	43.9	47.7	36.8	33	42.3	34.2	38.2
Other S/Term Sources	29.7	9.2	4.5	1.1	0.8	6.1	3.5	1.1	6	2.5	4.1

Source: Own calculations based on company accounts

Table A4.5 (e). Zimbabwe: Listed Companies' Gross Sources of Finance, 1990-99

(in per-cent of total financing), Firms controlled by **Government**

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*1990-99*
Internal Finance	8.5	9.2	7.7	4.6	14	16.7	17.4	9.5	30.4	32.6	22.3
Retained Income	2.1	2.4	2.4	2.4	4.6	0.4	0.5	0.2	22.9	21.1	12
Depreciation	6.4	6.8	5.3	2.2	9.4	16.3	17	9.3	7.5	11.5	10.3
External Finance	91.5	90.8	92.3	95.4	86	83.3	82.6	90.5	69.6	67.4	77.7
Long-term Finance	45.1	44.6	39.2	35.4	36.7	55.3	48.5	70.7	42.4	21.4	43.6
Equity Finance	0	0	0	0	0	0	0	54	0	0.3	11.6
Bonds	0	0	0	0	0	0	0	0	0	0	0
Bank Loans	14.8	16.3	10.5	6.6	1.5	1.1	0.8	0.2	0	0	1.3
Foreign Loans	9.8	9.5	9.6	8.2	6.2	18.4	15.6	2.7	2.4	7	6.7
Finance Lease	0	0	0	0	0	0	0	0.1	13.4	0.4	3.4
Hire Purchase	0	0	0	0	0	0	0	0.1	12.8	0	3.1
Other sources	20.4	18.8	19.1	20.6	29	35.9	32.2	13.7	13.7	13.7	17.4
Short-term Finance	46.4	46.2	53.1	60	49.3	28	34.1	19.8	27.2	46.1	34.1
Bank Overdraft	2	4	3.5	6.8	5.2	5.7	7.7	4.4	6.2	16.1	8.6
Bank Acceptance	10.3	12.3	8.4	12.5	6.3	3.5	2.9	3.3	0	0	2.3
Trade Credit	11.5	16.9	29.3	25.5	20	17.6	16	7.3	14.2	24.5	16.8
Other S/Term Sources	22.7	13.1	11.8	15.1	17.8	1.3	7.5	4.7	6.8	5.4	6.4

Source: Own calculations based on company accounts

Chapter 5 The Determinants of Capital structure Choice in Zimbabwe

5.1 Introduction

This chapter investigates the major determinants of capital structure choice of the Zimbabwean corporate sector. Although the capital structure literature has identified macroeconomic factors and firm characteristics as the major determinants of capital structure decisions, this study considers only company attributes as potential determinants of corporate capital structure.

The chapter is divided into three empirical sections. The first section examines capital structure decisions across the three regimes discussed in chapter 1. The main objective of the analysis is to investigate whether there is a structural change in capital structure choice following changes in government policy. The second section examines the impact of agency variables on capital structure decisions and in this case, both static and dynamic models of capital structure are estimated. The third empirical section of the chapter compares the financial behaviour of firms that consolidate financial statements and those that do not. A summary of the chapter is presented in section 5.

5.2 The Reform and capital structure choice[14]

The main objective of this section is to investigate whether there is a structural change in parameters of the capital structure equation in response to changes in government policies (regimes). In particular we aim to investigate whether the determinants of capital structure are sensitive to changes in government policy. There are reasons to believe that capital structure determinants have changed over time. Firstly, the government by liberalising the economy (including financial reform) may have motivated firms to use more equity finance or debt finance depending on which form of finance is more attractive. Secondly, changes in corporate tax, and investment tax credits introduced in 1980 and 1992 might have an impact on firms' decision to borrow, as suggested in the literature. Third, we have documented in the previous chapter that capital structure ratios and firm attributes have significantly changed across the repressive and liberalised regimes. Therefore our aim in this section is to

[14] This section is a revised and extended version of Mutenheri and Green (2003)

investigate whether there are significant differences in the estimated intercept as well as slope parameters of the capital structure regression equation by disaggregating the data by time periods (regimes).

The empirical approach that we adopt in this section is to first of all, test for structural change in the parameters of the capital structure equation. If there is evidence to suggest that coefficients of the variables have shifted, then the capital structure model is re-estimated, taking into account of the changes in these parameters.

5.2.2 The Empirical Model and Estimation Issues

The capital structure model takes the form

$$y_{it} = \alpha + x'_{it}\beta + \mu_{it} \qquad 5.1$$

with $\mu_{it} = \eta_i + \lambda_t + \upsilon_{it}$

where y_{it} is the debt ratio, defined as total debt scaled by book equity, x'_{it} is a vector of determinants that vary across firms and over time. These variables are size, tax, tangibility, liquidity, profitability, growth, and non-debt tax. The error term μ_{it}, is decomposed into a firm specific component η_i, a time specific component, λ_t and a component that varies across firms and over time, υ_{it} and α, β, are parameters to be estimated.

The definitions of the explanatory variables and the expected signs are presented in table 5.1 below. Thus, according to the expected signs shown in table 5.1 we test whether debt ratio is positively correlated with proxies for tangibility, tax and firm size. On the other hand, debt ratio is hypothesised to be negatively correlated with the proxy for non-debt tax. However, the hypothesised relationship between debt ratio and profitability, liquidity and growth could be positive or negative depending on the theoretical model under consideration. Thus the empirical results will help us to identify the theoretical model applicable to emerging markets. These variables, however, have been extensively used in empirical studies of capital structure yet there is still controversy on the hypothesised signs.

Table 5.1 Definitions of variables and the expected signs

Definition	Expected sign	Variable	Reference
$\frac{\text{Total borrowing(book value)}}{\text{Shareholders funds(book value)}}$		Leverage	Browne (1994), Chen et al (1998)
$\frac{\text{Fixed assets}}{\text{Total Assets}}$	+	Tangibility	Chung (1998), Colombo (2001) Friend and Lang (1988)
$\frac{\text{Tax paid}}{\text{Net income before tax}}$	+	Tax	Jahera (1996) Wansely (1996)
$\log\left(\frac{\text{total assets}}{\text{GDP deflator}}\right)$	+	Size	Shuetrim et al (1993)
$\frac{\text{Net profit before interest and tax(NIBIT)}}{\text{Total assets}}$	+ -	Profitability	Firth (1995), Hall et al (2000)
$\frac{\text{Current assets}}{\text{Current liabilities}}$	+ -	Liquidity	Ozkan (2001)
$\frac{\text{value of total assets at beginning of year} - \text{value of total assets at end of year}}{\text{Value of assets at beginning of year}}$	+ -	Growth	1)Titman and Wissells (1988) 2)Bevan and Danbolt (2002) Okzan (2002)

Depreciation / NIBIT	-	Non-debt tax shield	Wald (1999), Titman and Wissels (1988)

In this section, we estimate a model of capital choice using a balanced sample of 32 firms, each with data for the entire period 1975 to 1999. As discussed in the methodology chapter, our model of capital structure can be estimated in several ways. However in this section we choose to estimate the model by OLS and two way fixed effects methods. These regression techniques are based on the assumption that the slope coefficients are stable over the period of estimation. However, in the present study such an assumption is most likely to be violated since the data set is drawn from firms that have operated from three dramatically different regimes. Therefore, an econometric issue that needs to be addressed is the possibility of parameter structural shift. Thus an issue of interest is whether a single regression equation will adequately describe the capital structure decision across the three regimes. The procedure that we adopt is to estimate four regressions using OLS method. For the first regression we use data for the entire period, 1975 to 1999. The other three regressions use data from each of the regime, 1975 to 1979, 1980 to 1991 and 1992 to 1999. If we find evidence of structural change a fifth regression model, which allows for changes in coefficients, will be estimated.

The F test statistic (Chow test) has been widely used to test for structural change in OLS regressions. Thus for the purpose of testing for evidence of structural change we employ OLS method that ignores firm and time effects in panel data. We will also assume that the disturbance variances of the three regressions are drawn from the same distribution (Greene p. 292). Furthermore, we assume that the change to a new regime is discrete rather than gradual. Thus, we assume that the relationship between leverage and its determinants is fairly stable over the period 1975 to 1979, changes in 1980 and becomes stable up to 1991, changes again in 1992 and becomes stable up to 1999.

The null hypothesis that we wish to test is that there has been no structural shift against the alternative that there have been three distinctly different structures separated by two transitional periods in 1980 (independence) and 1992 (the reform programme). Empirical evidence of structural change would validate the importance of government policy in influencing corporate financial policy.

Our starting point is to estimate the following restricted model

$$debt_{it} = \alpha_0 + \alpha_1 Size + \alpha_2 Tax + \alpha_3 Tangib + \alpha_4 liquidity + \alpha_5 Profit \quad 5.2$$
$$+ \alpha_6 Growth + \alpha_7 Nondebt + \nu_{it}$$

This model assumes equality of both intercepts and regression slopes across the three regimes.

The second model is less restrictive. It allows for a different intercept across the regimes but maintains a common slope vector. This relationship is captured by the following equation

$$debt_{it} = \alpha_0 + \alpha_{indep} + \alpha_{reform} + \alpha_1 Size + \alpha_2 Tax + \alpha_3 Tangib + \alpha_4 liquidity + \alpha_5 Profit \quad 5.3$$
$$+ \alpha_6 Growth + \alpha_7 Nondebt + \nu_{it}$$

The third model allows intercepts and regression slopes to vary across the three regimes. This is the same as estimating three equations one for each regime as shown below

$$debt_{UDI} = \alpha_0^{UDI} + \alpha_1^{UDI} Size + \alpha_2^{UDI} Tax + \alpha_3^{UDI} Tangib + \alpha_4^{UDI} liquidity + \alpha_5^{UDI} Profit \quad 5.4$$
$$+ \alpha_6^{UDI} Growth + \alpha_7^{UDI} Nondebt + \nu_{UDI}$$

$$debt_{Indep} = \alpha_0^{Indep} + \alpha_1^{Indep} Size + \alpha_2^{Indep} Tax + \alpha_3^{Indep} Tangib + \alpha_4^{Indep} liquidity + \alpha_5^{Indep} Profit$$
$$+ \alpha_6^{Indep} Growth + \alpha_7^{Indep} Nondebt + \nu_{Indep}$$

$$\text{debt}_{\text{Re form}} = \alpha_0^{\text{Re form}} + \alpha_1^{\text{Re form}}\ \text{Size} + \alpha_2^{\text{Re form}}\ \text{Tax} + \alpha_3^{\text{Re form}}\ \text{Tangib} + \alpha_4^{\text{Re form}}\ \text{liquidity} + \alpha_5^{\text{Re form}}\ \text{Profit}$$

$$+ \alpha_6^{\text{Re form}}\ \text{Growth} + \alpha_7^{\text{Re form}}\ \text{Nondebt} + \nu_{\text{Re form}}$$

In order to choose the best model to capture the process underlying the data, we can employ an F test to test for (1) differential regressions (intercepts and slopes), (2) differential intercepts only and (3) differential slope vectors. We use residual sum of squares from models 1 (RSS1), 2 (RSS2) and 3 (RSS3) and the associated degrees of freedom are *n-k, n-k-1* and *n-pk* respectively[15]. Table 5.2 presents the three null hypotheses that we wish to test and the associated formula for the F test.

Table 5.2 Testing for structural change (chow test)

Null Hypothesis	Comment	F Statistic	Critical values ($(F_{0,99})$)
$\alpha_{UDI} = \alpha_{Indep} = \alpha_{\text{Re form}}$, $\beta_{UDI} = \beta_{Indep} = \beta_{\text{Re form}}$	Equality of intercepts and slopes	F_1 =4.40	F (16, 776) =2.04
$\alpha_{UDI} = \alpha_{Indep} = \alpha_{\text{Re form}}$,	Equality of intercepts	F_2 =20.0	F (2, 790)=4.61
$\beta_{UDI} = \beta_{Indep} = \beta_{\text{Re form}}$	Equality of slopes	F_3 =3.30	F (7, 776) =2.04

The first computed F statistic (F_1) is a test for the null hypothesis that the regression coefficients are stable across the regimes against the alternative that there is a significant structural change in response to changes in regimes. The computed F statistic is 4.40 and is greater than the critical value of 2.04 at the 1 percent level and thus rejecting the null hypothesis that coefficient vectors have not changed over time. The second F statistic (F_2) tests for structural change in the intercept assuming a common slope vector across the regimes. The computed F statistic is 19.97 compared to the critical value of 4.61 and thus rejecting the null hypothesis. The third F statistic (F_3) is a test for the null hypothesis that slope coefficients are the same across the regimes conditional on differential intercepts. The computed F statistic is 3.30 compared to 2.04, which again rejects the null hypothesis.

[15]RSS3 is the sum of residuals from the three separate equations, K is the number of estimated parameters and p is the number of periods.

The above F statistics therefore, suggest that there was a structural shift in the process underlying capital structure decisions of listed firms in Zimbabwe for the period 1975 to 1999. We can therefore conclude that all or some of the coefficients have changed in response to changes in economic regimes and the next logical procedure is to investigate which coefficients vary across the regimes.

The regression results for four equations (model 1 and model 3) are reported in table 5.3 below. The results show that the parameter estimates of these regressions are not only different in magnitude but also in some cases in the signs.

Table 5.3 Capital structure, OLS Results

Variable	Model 1 (1975-99)	UDI (1975-79)	Independence (1980-91)	Reform (1992-99)
Constant	0.2197	0.3590	0.3409	-0.3357
	(5.51)	(2.55)	(3.48)	(4.000)
Size	-0.0029	0.0017	-0.006	0.0399
	(0.861)	(0.120)	(0.706)	(5.96)
Taxation	-0.0004	-0.0933	-0.0004	-0.0467
	(1.15)	(1.81)	(0.903)	(1.81)
Tangibility	0.0532	-0.0258	-0.0358	0.0057
	(1.48)	(0.332)	(0.526)	(0.116)
Liquidity	-0.0210	-0.0580	-0.0571	-0.0072
	(3.94)	(3.83)	(3.21)	(1.51)
Profitability	-0.1885	-0.3110	-0.1367	-0.1543
	(2.98)	(1.77)	(1.39)	(1.84)
Growth	0.0254	0.0754	0.0192	0.0086
	(1.30)	(1.80)	(0.612)	(0.323)
NDT	0.0704	-0.0630	0.1871	0.2201
	(0.364)	(0.155)	(0.530)	(0.868)
R^2	0.05	0.20	0.04	0.18
Wald (joint)	38.54	38.41	14.65	55.31
	[0.00]	[0.000]	[0.041]	[0.000]

Notes
In parentheses are absolute t-statistics values
In square brackets are p-values

We use interaction variables to test for stability of individual coefficients over time. The three dummy variables D_{UDI}, D_{Indep} and D_{reform} of model 3 help to capture the effects of UDI, Independence and reform regimes respectively. Each of these dummy variables is interacted with each of the explanatory variables. In the first step D_{UDI} acts as the reference period such that the Independence and the Reform effects are relative to the UDI period. Treating D_{UDI} as the reference period the following equation is estimated.

$$\text{Debt} = \alpha_{UDI} + (\alpha_{Reform} - \alpha_{UDI})D_{Reform} + (\alpha_{Indep} - \alpha_{UDI})D_{Indep} + \beta_{UDI}\sum X \qquad 5.5$$

$$+ (\beta_{Reform} - \beta_{UDI})D_{Reform}\sum X + (\beta_{Indep} - \beta_{UDI})D_{Indep}\sum x + \nu$$

Thus the significance of each of these parameters as indicated by t statistics, is of economic interest. For example, if the coefficient of the interaction of liquidity and D_{Reform} (*liq(reform)*) is found to be statistically significant, this would mean that the coefficient on liquidity is not the same during UDI and reform periods and thus making the pooled OLS inappropriate to estimate the capital structure model.

However, the above specified equation tests for differences in parameter estimates between UDI and each of the other two regimes. Therefore in order to test differences in coefficients between Independence and Reform periods we estimate the following interaction equation.

$$\text{Debt} = \alpha_{Indep} + (\alpha_{Reform} - \alpha_{Indep})D_{Reform} + (\alpha_{UDI} - \alpha_{Indep})D_{Indep} +$$

$$\beta_{indep}\sum X + (\beta_{Reform} - \beta_{Indep})D_{Reform}\sum X + (\beta_{UDI} - \beta_{Indep})D_{UDI}\sum x + \nu \qquad 5.6$$

The above equation shows that the independence period is the reference period therefore the estimation results from these two equations will help us to test for the equality of regression coefficients in the three regressions of the three regimes.

The estimation results from the above equations are reported in table 5.4. First we compare the coefficients of independence and UDI regressions. The null hypothesis is that the coefficient vectors are the same in the two periods (Independence and UDI). The results in the first row show that the coefficient on taxation is significantly different between Independence and UDI periods and the differences in all other coefficients are insignificantly different from zero. These results, thus, suggest that the change in Government tax policy in 1980 had an impact on corporate financial behaviour.

Table 5.4. Testing for structural change (dummy variable approach)

Parameter								
	Dummy	Size	Taxation	Tangibility	Liquidity	Profitability	Growth	NDT
Indep vs UDI	-0.0184	-0.0076	0.0930	-0.0099	0.0005	0.1677	-0.0557	0.2606
	(0.114)	(0.482)	(1.88)	(0.102)	(0.0246)	(0.877)	(-1.13)	(0.515)
Reform vs	-0.6947	0.0382	0.0466	0.0315	0.0507	0.1567	-0.0668	0.2831
UDI	(4.07)	(2.38)	(0.791)	(0.327)	(3.22)	(0.789)	(1.28)	(0.565)
Reform vs	-0.6762	0.0458	-0.0464	0.0414	0.0502	-0.0110	-0.0110	0.0225
Indep	(4.93)	(4.03)	(1.45)	(0.476)	(2.90)	(0.0800)	(0.252)	(0.050)

Notes
In parentheses are absolute t-statistics values

Rows 2 and 3 of table 5.4 show that the Reform equation has intercept, size and liquidity estimates that are significantly different from the Independence and UDI periods. On the other hand the empirical tests show that the relationship between leverage and each of the tangibility, profitability, growth and non-debt tax variables is fairly stable across the three regimes.

The above simple tests suggest evidence of a structural change in estimated coefficients on tax, size and liquidity across the regimes and in order to incorporate this into our model, we interact the independence dummy with tax variable (*tax*Indep.),* and the reform dummy with size (*size*Reform*) and liquidity (*liq*Reform*) variables. In this way *tax*Indep* allows the effect of tax on leverage to be different during the independence period. The coefficient measures to what extent the effect of corporate tax is different for the independence period in comparison with the reference period, being UDI and reform periods. In the same way *size*reform* and

*liq*reform* allow the effect of size and liquidity to be different during the reform and the coefficients measure the extent to which the effects of size and liquidity are different for the reform regime in comparison with the reference period, being UDI and independence periods.

The equation with interaction terms is estimated as a two way fixed effects model. This model assumes that the unobservable firm and time effects are significant. Thus the model allows for differential intercepts and slope vectors for tax, size and liquidity, but assumes a common slope vector for tangibility, profitability, growth and non-debt tax. We use the F-test to test for the significance of firm and time effects and the results of the F-tests are reported in table 5.5.

The results show that for the four regression equations, the null hypothesis that firm capital structure decisions are not influenced by the unobservable firm-specific and time-specific effects factors is rejected at the 1 per cent level of significance. Therefore the methodology adopted in this section is appropriate since it controls for the effects of these unobservable factors (e.g management attitude, macroeconomic shocks and financial market changes). Thus, we re-estimate the capital structure equations by two way fixed effects estimator. Since we have controlled for differences in intercepts and slope coefficients, in this section, our discussion of capital structure decisions is primarily based on the regression results of the sample data set 1975 to 1999. The estimation results are presented in table 5.6 and we now turn to a discussion of these results.

Table 5.5 Test of significance of firm and time effects

	Null Hypothesis	Test Statistic	Statistic Distribution	P-Value
Panel A; Entire period 1975-99				
Firm and Time effects	$\eta_i = \lambda_t = 0$ $\forall_i = 1,...32$ $\forall_t = 1,....25$	629.3	χ^2_{56}	0.00
Firm effects	$\eta_i = 0$ $\forall_i = 1,...32$	532.9	χ^2_{31}	0.00
Time Effects	$\lambda_t = 0$ $\forall_t = 1,....25$	66.54	χ^2_{24}	0.00
Panel B; UDI period 1975-79				
Firm and Time effects	$\eta_i = \lambda_t = 0$ $\forall_i = 1,...32$ $\forall_t = 1,....5$	711.7	χ^2_{36}	0.00
Firm effects	$\eta_i = 0$ $\forall_i = 1,...32$	659.9	χ^2_{32}	0.00
Time Effects	$\lambda_t = 0$ $\forall_t = 1,....5$	37.81	χ^2_4	0.00
Panel C; Indep. period 1980-91				
Firm and Time effects	$\eta_i = \lambda_t = 0$ $\forall_i = 1,...32$ $\forall_t = 1,....12$	667.4	χ^2_{43}	0.00
Firm effects	$\eta_i = 0$ $\forall_i = 1,...32$	625.1	χ^2_{32}	0.00
Time Effects	$\lambda_t = 0$ $\forall_t = 1,....12$	36.50	χ^2_{11}	0.00
Panel D; Reform period 1992-99				
Firm and Time effects	$\eta_i = \lambda_t = 0$ $\forall_i = 1,...32$ $\forall_t = 1,....8$	310.6	χ^2_{39}	0.00
Firm effects	$\eta_i = 0$ $\forall_i = 1,...32$	268.7	χ^2_{32}	0.00
Time Effects	$\lambda_i = 0$ $\forall_t = 1,....8$	22.57	χ^2_7	0.002

Table 5.6 Regression Results. Two Way Fixed Effects

Variable	Model 1 (1975-99)	Model 2 (1975-99)	UDI (1975-79)	Independence (1980-91)	Reform (1992-99)
Constant	-0.1181	0.0885	0.1575	-0.7067	0.3437
	(1.08)	(0.747)	(0.694)	(3.26)	(1.31)
Size	0.0256	0.0108	-0.0096	0.1010	-0.0283
	(2.11)	(0.842)	(0.393)	(4.31)	(1.22)
Taxation	-0.0006	-0.0367	0.0222	-0.0006	-0.0320
	(2.04)	(1.67)	(0.790)	(2.26)	(1.57)
Tangibility	0.0923	0.0672	-0.2215	-0.0516	0.1212
	(2.05)	(1.49)	(2.81)	(0.709)	(1.77)
Liquidity	-0.0199	-0.050	-0.0356	-0.0610	-0.0045
	(4.48)	(5.32)	(4.01)	(3.87)	(1.17)
Profitability	-0.2231	-0.2230	-0.02466	-0.2535	-0.1696
	(3.91)	(3.93)	(0.216)	(3.27)	(2.10)
Growth	0.0287	0.0282	0.0102	-0.0012	0.0315
	(1.74)	(1.73)	(0.424)	(0.0510)	(1.50)
NDT	0.2499	0.2076	-0.2044	0.8368	0.2403
	(1.20)	(1.01)	(0.720)	(1.72)	(1.02)
Size(Reform)	-	0.0267	-	-	-
		(3.02)			
Liq(Reform)	-	0.0375	-	-	-
		(3.59)			
Tax(Indep)		0.0362			
		(1.65)			
R^2	0.47	0.48	0.89	0.67	0.65
Wald (joint)	69.9	94.01	26.64	61.08	14.31
	[0.000]	[0.000]	[0.000]	[0.000]	[0.046]
Wald (dummy)	629.3	618.5	763.4	667.4	310.6
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Wald (time)	66.54	84.56	19.42	36.50	22.57
	[0.00]	[0.000]	[0.001]	[0.00]	[0.002]

Notes
In parentheses are absolute t-statistics values
In square brackets are p-values

5.2.3 Discussion of Results

Size

The coefficient on size has the expected positive sign. For the model without the interaction terms (model 1), the relationship between leverage and firm size is significant at the 5 per cent level. However, adding interaction variables to model 1 renders this relationship insignificant. However, the variable *size*reform*, which is the interaction of firm size and reform dummy is positively related to leverage at the 5 per cent level. This shows the importance of firm size to debt market accessibility after the implementation of the reform programme. Therefore, the estimation results support the hypothesis that firm size has a positive impact on borrowing decisions and this is consistent with the empirical findings of Firth (1995) and Rajan and Zingales (1995), among others.

Taxation

Although the estimated coefficient on the tax variable is significantly different from zero in both models, it has an unexpected sign and has a relatively small magnitude. The negative relationship between the tax rate and the debt ratio is consistent with the findings of Hussain and Nivorozhkin (1997), Lowe et al (1998) and Booth, et al (2001), but inconsistent with the empirical work of Homaifar et al (1994) and Jahera and Llyods (1996).

Tangibility

The tangibility variable has the expected positive sign in models 1, 2 and reform equation. For the other two periods, UDI and Independence, tangibility has a negative sign. At the 5 per cent level, tangibility is significantly different from zero in model 1, independence and reform equations. The positive sign of the coefficient on tangibility would suggest that firms with more fixed assets tend to borrow more, which is consistent with the predictions of theory, as suggested by Jensen and Meckling (1976) or Williamson (1988). On the other hand, the negative sign of the coefficient on tangibility in the pre-reform period would suggest that firms with more fixed assets tend to borrow less. A possible explanation for this relationship is that the variable may be a proxy for the non-debt tax shields of Zimbabwean firms rather than a

measure of asset specificity. In Zimbabwe, in the pre-reform regime, a wide range of fixed assets used to qualify for a Special Initial Allowance which allows 100% first year depreciation of fixed assets for corporate tax purposes. Companies that acquired fixed assets used to enjoy a substantial tax shelter, which in turn would reduce the taxable income that could be shielded by debt. Thus, purchases of fixed assets may tend to dominate the tangibility ratio and also the tax shields enjoyed by Zimbabwean firms during that time. The reform programme has reduced the number of fixed assets qualfying for the Special Initial Allowance.

Therefore, the results from model 1 and the post-reform equation are consistent with the view that tangible assets act as colletarals, implying that firms with more tangible assets can borrow more than firms with few tangible assets (Rajan and Zingales, 1995). Thus we find evidence to support the view that tangible assets mitigate the various costs (agency and bankruptcy costs) associated with the use of external finance. This suggests that the Zimbabwean financial sector, small as it is, is only willing to give finance to firms with more tangible assets. Thus we can predict that firms that are mainly involved in Research and development have less chance of getting loans from banks as compared to firms in the mining sector.

Liquidity

The coefficient on liquidity is negative and significantly different from zero. This negative relationship between leverage and liquidity implies that firms in Zimbabwe use liquid assets to finance their investments. In model 2, interacting liquidity with the reform dummy leads to a positive coefficient of 0.0375. consequently, the coefficient on liquidity during the reform period is –0.0125 which is smaller in magnitude to -0.050 before the reform period. Thus the use of liquid assets to finance investment was more pronounced under the repression period than under the liberalised financial system. This suggests that Zimbabwean firms face cash flow problems when financing investment projects. This is also consistent with the prediction of the pecking order theory that firms consider internal finance first before contemplating on borrowing. The negative relationship between liquidity and leverage is also in line with the empirical work of Ozkan (2001) and Ngugi (2002) for UK and Kenyan firms resepectively.

Profitability

The estimated coefficient on profitability is negative and significantly different from zero at the 1 per cent level. This finding is consistent with predictions of the pecking order hypothesis and the empirical work of Hall et al (2000), Colombo (2001) and Bevan and Danbolt (2002). Thus firms may prefer internal finance because it is the cheapest form of financing investments. In the Zimbabwean context, firm ownership and control is in the hands of relatively few institutions, therefore the preference for internal financing strategically prevents dilution of existing shareholder claims. Another possible explanation is that firms heavily rely on internal finance because external capital markets are not easily accessible to most firms. Firms may also be found to rely on internal funds because of management's desire to maintain financing flexibility and reduce monitoring by outsiders. These econometric results are consistent with previous findings that internal finance contributes 25 % of corporate financing in Zimbabwe and also that it is costly to borrow since interest rates are extremely high in the range of 56-78%.

Growth

The estimated coefficient on growth variable is positively related to leverage but is significant only at the 10 per cent level. Although there is weak evidence of a positive relationship, these results contradict the theoretical predictions and other empirical studies that have found a negative and significant relationship (see for example, Barclay, et al 1996 and Gul, 1999). The positive relationship between leverage and growth in assets suggests that high growth firms borrow more to finance investments. This suggests that although firms prefer internal finance they eventually consider external financing when retained earnings are exhausted. Therefore, in this context the financial sector plays an important role in the financing of the firms' investment growth.

Non-debt tax

The estimated coefficient on nondebt tax shield variable, in the reform equation, models 1 and 2, is positive but insignificantly different from zero. A weak positive relationship between leverage and nondebt tax shield is, however found in the independence regression. Although the coefficient on non-debt tax is negative in the

UDI regression the relationship is insignificantly different from zero. Therefore we can conclude that for the Zimbabwean corporate sector nondebt tax shields do not play an important part in influencing firm behaviour. Thus, our results do not support DeAngelo and Masulis' (1980) hypothesis that non-debt tax shields negatively affect corporate financing decisions. The previous studies that do not find a significant influence of non-debt shields on firms' leverage ratios include Titman and Wissels (1988) and Homaifar et al (1994). However, the insignificant relationship between leverage and non-debt tax shields may be due to depreciation being a poor proxy for non-debt tax shield. We will consider an alternative measure of non-debt tax shield in the next sub-section below.

5.3 Agency Factors and capital structure Decisions

5.3.1 Introduction

As discussed in chapter two, the corporate finance literature suggests that agency factors are important determinants of capital structure decisions. Furthermore, the empirical literature suggests that these agency factors are proxied by ownership concentration, size of board of directors, state ownership, family ownership, managerial ownership and institutional ownership (Crutchley and Jensen, 1996, Wiwattanakantang, 1999 and Wen et al, 2002). However, the empirical results are inconclusive and it is also not clear whether agency factors are important in the context of emerging markets. Most studies using data from developing countries have not analysed the impact of agency factors on capital structure decisions due to data unavailability. However, in the Zimbabwean case, data on managerial and institutional ownership is available from 1995. Therefore in this section, we investigate the impact of agency factors on capital structure decisions over the period 1995-1999. We estimate both the static and dynamic models and also consider alternative definitions of variables.

5.3.2 Static Model

In the empirical literature defining leverage and its determinants has always been a controversial issue. The debate on definitions of debt ratios is centred on whether to use market or book value of both debt and equity. Rajan and Zingales (1995) argue that 'the extent of leverage- and the most relevant measure- depends on the objective of the analysis' p. 1427. In addition Bevan and Danbolt (2002) have examined the sensitivity of capital structure determinants to various measures of leverage and their sub-elements in the UK. Their findings suggest that both magnitudes and signs of coefficients are highly sensitive to alternative measures of leverage. Sweeney et al (1997), however, argue that the theory of capital structure is in terms of market rather than book value of debt.

In this section we use five alternative measures of leverage to examine the capital structure of listed firms in Zimbabwe. The first measure of leverage, *debt to total*

assets, is defined as the ratio of total interest bearing debt to total assets. This is a broad definition of leverage and has been extensively used in the capital structure empirical literature. The second definition, *book debt-equity* is the ratio of total interest bearing debt to book equity. Although few researchers have used this measure in empirical studies, this is the mainly used measure of leverage in Zimbabwe (company reports and stock market reports). The third measure, *book debt-capital*, is defined as total interest bearing debt divided by the sum of book equity and interest bearing debt. Fourth, *market debt-equity*, is defined as the ratio of total interest bearing debt to market value of equity. The final measure of leverage is *market debt capital* which is defined as the ratio of total interest bearing debt to the sum of market value of equity and total interest bearing debt. These definitions and references cited are presented in table 5.8a.

Our objective in this section is twofold. First, we want to examine the extent to which each of these measures of leverage, as defined above, can be explained by the firm characteristics suggested in the literature. Second, we examine the sensitivity of (signs and magnitudes) capital structure factors to alternative measures of leverage. In order to achieve these objectives we estimate the empirical model presented in the previous section (equation 5.1):

5.3.2.1 Data and estimation issues

We use data from a sample of 51 firms spanning over the period 1995-99 to understand capital structure decisions in Zimbabwe. The process of selecting the 51 companies is summarised as shown below.

Firms listed on the Zimbabwe stock exchange in 1999	66
Less	
Firms listed for less than 3 years	-3
Less	
Financial Firms	-8
Less	
Firms for which annual reports could not be found	-3
Less	
Firms reporting in currencies other than Zimbabwean dollars	-1
Final sample	51

In selecting the factors affecting capital structure decisions we initially tried 15 determinants and for each of these determinants we considered several different definitions. In the first stage of the estimation procedure we computed a correlation matrix and deleted all the determinants that had correlation coefficients of more than 0.6 among themselves. Determinants with correlation coefficient of less than 0.1 with each of the determinants were also deleted. This procedure left us with 11 potential determinants of capital structure decisions and the definitions of these variables are presented in table 5.7b below. Tables 5.8 and 5.9 respectively show descriptive statistics and the correlation matrix of variables that are used in this section.

Table 5.7(a) Definitions of leverage

Definition	*Acronyms*	*Reference*
$\frac{\text{Total borrowing (book value)}}{\text{total assets (book value)}}$	BDR	Wald (1999), Wiwattanakantang (1999)
$\frac{\text{Total borrowing (book value)}}{\text{Shareholders funds (book value)}}$	BDER	Browne (1994) Chen et al (1998)
$\frac{\text{Total borrowing (book value)}}{\text{Total borrowing (book value)} + \text{Shareholders funds (book value)}}$	BDCR	Hirota (1999) Jordan et al (1998)
$\frac{\text{Total borrowing (book value)}}{\text{Shareholders funds (market value)}}$	MDER	Chen et al (1998) Prasaad et al (2001)
$\frac{\text{Total borrowing (book value)}}{\text{Total borrowing (book value)} + \text{Shareholders funds (market value)}}$	MDCR	Adedeji (1998) Wiwattanakantang (1999)

Notes

BDR- Book Debt Ratio

BDER- Book Debt Equity Ratio

BDCR- Book Debt Capital Ratio

MDER- Market Debt Equity Ratio

MDCR- Market Debt Capital Ratio

Table 5.7 (b) definitions of explanatory variables

Definition		*Reference*
$\frac{\text{dividends}}{\text{income attributable to shareholders}}$	Payout	Allen and Mizuno (1989) Adedeji (1998)
$\frac{\text{Fixed assets}}{\text{Total Assets}}$	Tangibility	Chung (1998) Colombo (2001) Friend and Lang (1988)
$\frac{\text{Tax paid}}{\text{net income before tax}}$	Tax	Jahera (1996) Wansely (1996)
$\log\left(\frac{\text{total sales}}{\text{GDP deflator}}\right)$	Size	Shuetrim et al (1993)
$\frac{\text{Net profit defore interest and tax (NIBIT)}}{\text{Total assets}}$	Profitability	Firth (1995) Hall et al (2000)
$\frac{\text{current assets}}{\text{current liabilities}}$	Liquidity	Ozkan (2001)
$\left(\frac{\text{NIBIT}}{\text{Book Equity}}\right)\left(\frac{\text{Retained income}}{\text{NIBIT} - \text{Taxation}}\right)$	Growth	Green et al (2002)
$\frac{\text{defered tax}}{\text{total assets}}$	Non-debt tax	1)Wald (1999) Titman and Wisselss (1988) 2) Bennet and Donnelly (1993)
$\frac{\text{shares traded}}{\text{market capitalisation}}$	Stock liquidity	
$\frac{\text{total shares held by insiders}}{\text{total number of floated company shares}}$	Insider ownership	Jahera (1996)
$\frac{\text{total shares held by largest single shareholder}}{\text{total number of floated company shares}}$	Largest shareholder	Jong (2001)

Table 5.8 Descriptive statistics

	Mean	Std dev.	Minimum	Maximum	Skewness	Kurtosis
Debt-total assets	0.1501	0.1190	0.0013	0.6933	1.1923	1.9176
Book debt-equity	0.3075	0.3108	0.0023	1.7954	1.8488	4.1434
Book debt-capital	0.2014	0.1476	0.0023	0.6423	0.7418	-0.1836
Market debt-equity	0.4947	0.6889	0.0013	4.2432	2.3687	6.4287
Market debt-capital	0.2409	0.2119	0.0013	0.8093	0.8875	-0.3287
Tangibility	0.4802	0.1960	0.0827	0.9482	0.1420	-0.663
Profitability	0.1544	0.1041	-0.3194	0.5228	-0.3100	3.7858
Tax	0.2428	0.1706	-0.2501	0.9646	0.1492	1.0696
Non-debt tax	0.0826	0.0684	0	0.3949	1.0513	1.7937
Payout	0.3097	0.1859	-0.2108	0.9408	0.2411	0.5552
Growth	0.1966	0.1786	-0.1475	1.0620	1.488	3.1842
Size	6.7721	1.0703	3.2066	9.1800	-0.4087	0.4309
Stockliq	0.1122	0.1452	0.0012	1.3405	4.5311	29.694
Liquidity	1.6042	0.5750	0.1204	4.1676	0.9082	1.3726
Insider	0.0624	0.1428	0.00	0.7298	2.8223	7.6390
Largest	0.4376	0.1838	0.0676	0.8500	0.1728	-0.6431

Table 5.9 Correlation Matrix

	Debt -total assets	Book debt-equity	Book debt-capital	Market debt-equity	Market debt-capital	Tangib	Profit	Tax a	Non debt tax	Payout	Growth	Size	Stockliq	Liquidity	Insider	Largest
Debt-total assets	1.00															
Book debt-equity	0.8911	1.00														
Book debt-capital	0.9092	0.9634	1.00													
Market debt-equity	0.519	0.5682	0.6070	1.00												
Market debt-capital	0.6358	0.6493	0.7110	0.9159	1.00											
Tangibility	-0.0447	-0.2289	-0.1921	-0.0668	-0.0519	1.000										
Profitability	-0.2494	-0.2624	-0.2301	-0.2946	-0.3508	-0.1940	1.00									
Tax	-0.3188	-0.222	-0.2400	-0.2315	-0.2487	-0.2736	0.2339	1.00								
Non-debt tax	-0.0387	-0.1427	-0.1037	-0.0301	-0.0367	0.3639	0.0618	-0.114	1.00							
Payout	-0.1510	-0.1430	-0.1521	-0.2515	-0.2543	0.0713	0.0448	0.075	0.082	1.00						
Growth	-0.1697	-0.0856	-0.0911	-0.2089	-0.2137	-0.3119	0.504	0.311	-0.216	-0.156	1.00					
Size	-0.1150	0.00248	0.0439	0.1032	0.0913	0.2184	0.006	0.049	0.2236	0.0744	-0.062	1.00				
Stockliq	0.2308	0.2687	0.2209	0.1199	0.1737	0.0730	-0.0671	-0.101	0.0824	-0.121	-0.018	-0.004	1.00			
Liquidity	-0.3052	-0.2689	-0.2933	-0.2723	-0.3106	-0.3820	0.2238	0.156	-0.0097	-0.021	0.2701	-0.081	-0.0733	1.00		
Insider	0.26607	0.2063	0.236	0.3154	0.3124	-0.1108	-0.1265	-0.142	-0.035	-0.043	0.0048	-0.187	0.1797	-0.057	1.00	
Largest	-0.2214	-0.1425	-0.1967	-0.2057	-0.2368	-0.0729	-0.0729	0.003	-0.14097	0.1228	-0.0085	-0.002	-0.267	0.088	-0.339	1.00

The first estimation issue that we need to address before choosing an estimator for our equation, is whether firm and time effects are significant. If both effects exist, then the best estimator is the two way fixed effects, as done in section 5.2 above. If either of these effects does not exist, then the model is estimated by a one way fixed effects (within) estimator. However, if both effects are insignificant, OLS becomes the best estimator.

The results of the tests for firm and time effects shown in table 5.10 below, suggest that firm effects are significant for all the five equations. Thus, the null hypothesis that firm effects do not exist is rejected for all the five equations. Although time effects are insignificant in equations where leverage is defined in terms of book value, they are found to be significant in the two equations where leverage is in terms of market value. Therefore the null hypothesis that the time effects do not exist is rejected for the market leverage equations, but cannot be rejected for the three book leverage equations. Thus the three book leverage equations can be estimated as a one way fixed effects model, while the two market equations can be estimated as a two way fixed effects model. However, the within transformation sweeps the firm and time effects and therefore we choose the 2 way within estimator as the best estimator of equation 5.7[16].

[16] The equation may also be estimated by the two way random effects model, but for consistence sake we use the within estimator throughout in this chapter.

Table 5.10 Tests for firm and time effects.

	F-Test Statistic	χ^2	P-Value
Panel A; debt-total assets			
Firm and Time effects	442.8	55	0.00
Firm effects	432.9	50	0.00
Time Effects	5.772	4	0.217
Panel B; Book Debt-equity Ratio			
Firm and Time effects	371.8	55	0.00
Firm effects	367.2	50	0.00
Time Effects	4.212	4	0.378
Panel C; book debt-capital			
Firm and Time effects	397.3	55	0.00
Firm effects	397.4	50	0.00
Time Effects	2.733	4	0.603
Panel D; market debt-equity			
Firm and Time effects	172.4	55	0.00
Firm effects	153.1	50	0.00
Time Effects	12.29	4	0.015
Panel C; market debt-capital			
Firm and Time effects	249.6	55	0.00
Firm effects	216.6	50	0.00
Time Effects	17.21	4	0.002

Notes

For the firm and time effects the null hypothesis is $\eta_i = \lambda_t = 0 \quad \forall_i = 1,.....51 \quad \forall_t = 1,.....5$

For the firm effects the null hypothesis is $\eta_i = 0 \quad \forall_i = 1,.....51$

For the time effects the null hypothesis is $\lambda_t = 0 \quad \forall_t = 1,.....5$

Since our aim is to examine the extent to which the leverage ratios can be explained by the 11 firm characteristics, we adopt a two step estimation procedure. Firstly, we estimate the general model including all the 11 explanatory variables. In the second step, all insignificant variables are eliminated one by one in each equation in order to get the specific model (the general to specific approach). The results from this two step procedure are reported in table 5.12

The results reported in table 5.12b show that not all of these 11 determinants (for example, growth and size) have a significant effect on capital structure decisions. More importantly the magnitudes of the parameter estimates are very sensitive to alternative definitions of leverage. Some factors are important in explaining capital structure decisions when leverage is in terms of book value rather than market value and vice versa.

Table 5.12 (b) shows estimation results after deleting insignificant variables in each of the five regressions and we now turn to the discussion and the interpretations of results. The discussion, however, shall be short since the results for liquidity, tax, growth and profitability are qualitatively similar to those presented in section 5.2.

5.3.2.2Discussion of estimation results

Tangibility

Tangibility is inversely related to all measures of leverage. This relationship is, however not significant in the debt-asset equation. Therefore, we have found evidence that tangibility is negatively correlated with debt-equity (capital) ratios, regardless of whether the ratio is measured in terms of book or market value. These results are, however, inconsistent with the theoretical predictions of Williamson (1988) and empirical findings in the previous section. A possible explanation might be due to the difference in sample sizes and estimation period. During the 1995-99 period, tangibility might be a proxy for non-debt tax shield rather than a proxy for asset structure.

Capital structure regression Results: Static Model

Table 5.12

	(a) General model					(b) Specific model				
Variable	BDCR	BDER	BDR	MDCR	MDER	BDCR	BDER	BDR	MDCR	MDER
Tangibility	-0.2927	-0.6504	-0.0632	-0.3195	-0.9259	-0.2966	-0.6541	-	-0.3547	1.0777
	(3.84)	(4.05)	(1.00)	(2.52)	(2.04)	(4.15)	(4.09)		(3.02)	(2.55)
Profitability	-0.2580	-0.7274	-0.1085	-0.3290	-0.6263	-0.2576	-0.7355	-0.0893	-0.3636	-0.5987
	(2.96)	(3.96)	(1.51)	(2.27)	(1.21)	(3.05)	(4.07)	(1.46)	(2.99)	(1.20)
Tax	-0.1305	-0.3076	-0.1178	-0.1520	-0.5557	-0.1333	-0.3134	-0.1109	-0.1779	-0.5750
	(2.73)	(3.05)	(2.98)	(1.91)	(1.95)	(2.87)	(3.19)	(2.89)	(2.36)	(2.08)
NDT	-0.2079	-0.5889	-0.2312	-0.1171	-0.8795	-0.2091	-0.5921	-0.2680	-	-
	(1.27)	(1.70)	(1.70)	(0.429)	(0.9000)	(1.30)	(1.72)	(2.05)		
Payout	-0.0210	-0.0230	-0.0418	-0.1514	-.5815	-	-	-0.0488	-0.1343	-0.6223
	(0.533)	(0.276)	(1.28)	(2.30)	(2.48)			(1.62)	(2.24)	(2.73)
Growth	0.0571	0.1409	0.0205	-0.0536	-0.4496	0.0672	0.1506	-	-	-0.4263
	(1.05)	(1.23)	(0.458)	(0.594)	(1.39)	(1.31)	(1.39)			(1.33)
Size	0.0117	0.0590	-0.0071	0.0371	0.1560	-	0.0614	-	-	-
	(0.490)	(1.18)	(0.362)	(0.938)	(1.10)		(1.25)			
Stockliq.	0.0760	0.3606	0.0910	0.1032	0.0227	0.0708	0.3577	0.0931	-	-
	(1.45)	(3.25)	(2.09)	(1.18)	(0.0724)	(1.37)	(3.25)	(2.16)		
Liquidity	-0.0866	-0.1680	-0.0722	-0.0684	-0.2096	-0.0879	-0.1683	-0.0666	-0.0748	-0.2244
	(5.98)	(5.50)	(6.02)	(2.83)	(2.43)	(6.22)	(5.53)	(6.19)	(3.21)	(2.66)
Insider	-0.3171	-1.0793	-0.2249	-0.1884	-0.9284	-0.3059	-1.0648	-0.2308	-	-1.0138
	(2.44)	(3.94)	(2.09)	(0.869)	(1.20)	(2.43)	(3.97)	(2.19)		(1.35)
Largest	0.1582	0.3947	0.1949	0.1926	0.6915	-	0.3938	0.1853	-	-
	(0.927)	(1.10)	(1.38)	(0.678)	(0.680)		(1.10)	(1.40)		
R^2	0.31	0.39	0.30	0.18	0.17	0.31	0.39	0.30	0.17	0.16
$X^2(11)$	82.96	117.6	79.16	40.42	36.75	82.48	118.1	78.64	37.56	35.12
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Notes
In parentheses are absolute t-statistics values
In square brackets are p-values

Profitability

The coefficient on profitability is negative in all equations. The magnitude of the coefficient estimate for profitability attribute is largest in the debt-equity equation (-0.74) and least in the debt-asset equation (-0.09). However, at the 10 per cent level, this relationship is significantly different from zero in 3 equations, namely book debt-equity, debt-capital and market debt-capital. Thus we do not find empirical evidence of pecking order financing for the broad measurement of debt and market debt-equity.

Tax

The regression coefficients for the effect of tax on corporate leverage are negative and statistically significant in all equations. This suggests that firms employ more debt in their capital structures when the tax rate decreases. Thus our results contradict the Modigliani and Miller (1963) hypothesis that the corporate taxation has a positive impact on firm borrowing decisions. However, the negative relationship between the corporate tax rate and leverage is still consistent with the findings of Krishman and Moyer (1996), Wansely (1996) and Jordan et al (1998), among others. In Zimbabwe, the negative relationship could be attributable to an expectation effect induced by government policy. The corporate tax rate was reduced every year from 1995-1999. Companies would therefore have had an incentive to bring forward tax shelters as much as possible to maximise their tax benefits prior to the next cut. Thus successive tax cuts would be associated with increases in debt ratios as firms expected further tax cuts in the future.

Non-debt tax

The coefficient estimates for the non-debt attribute are negative in all equations, but statistically significant in the book debt-equity and debt-asset equations. Thus, the results show that non-debt tax is not correlated with market leverage. The negative effect of non-debt tax on capital structure decisions is consistent with the theoretical prediction but differ from the empirical findings of the previous section. A possible explanation is that in this section we have employed a better proxy for non-debt tax shields. The results suggest that firms with more non-debt tax shields have low leverage ratios and these results are consistent with the finding of Bennet and Donnelly (1993) who use the same definition of non-debt tax shield.

Payout

The results indicate that there is a negative relationship between the payout ratio and all types of debt. However, at the 10 per cent level, this relationship is significant when leverage is defined in terms of book value. Thus we find no significant relationship between payout and market leverage. Allen and Mizuno (1993) and Adedeji (1998) also do not find a significant relationship between leverage and payout ratio for Australia and UK respectively.

Growth

The coefficient for the growth variable is positively correlated with book leverage, but inversely correlated with market leverage. However, this relationship is not significant even at the 10 per cent level. Therefore, we do not find evidence to support the argument that firm growth opportunity has an impact on corporate borrowing decisions. Other studies that do not find a significant influence of growth opportunities on leverage include Bennet and Donnelly (1993) and Boyle and Eckhold (1994). However, previous studies by Ozkan (2002) and Bevan and Donbolt (2002) use the same definition but report a significant negative influence of growth on leverage. Thus, although previous studies have supported the prediction that high growth firms borrow less, in the Zimbabwean case the results suggest that leverage is independent of firm growth opportunities.

Size

Although the sign of the size variable has the expected positive sign in 4 out of 5 equations it is insignificant in all equations. Our results, therefore, show that the size of the firm has no significant impact on borrowing decisions. Thus the results are inconsistent with the results reported in the previous section and previous studies by Shuetorim et al (1993) and Homaifar et al (1994), among others. A possible explanation may be attributable to differences in sample sizes employed in this section and the previous one.

Stock liquidity

The results show that the relationship between stock liquidity and two of the book leverage ratios (debt-equity and debt-asset) is positive and significant. Thus firms borrow more during the time when their stock prices are rising.

Liquidity

We find a significant inverse relationship between liquidity and all types of book and market debt ratios. This finding supports the prediction that firms use liquid assets to finance growth. This is consistent with the findings of Ozkan (2002) and Ngugi (2002) and the results reported in the previous section, using a sample of 32 firms.

Insider ownership

Our results show that insider ownership has a significant inverse relationship with book value debt ratios. Thus, as predicted, firms with a substantial managerial ownership have lower debt levels. These results are consistent with the findings of Friend and Lang (1988), Jensen et al (1992) and Firth (1995), among others. However, the results contradict the empirical work by Wansley (1996) who report a positive relationship between leverage and insider ownership for US firms. The results are also inconsistent with the findings of Jahera and Lloyds (1996) and Wiwattanakantang (1999) who do not find a significant influence of insider ownership on leverage.

Largest

The regression results show that in all regressions, the variable largest is insignificant and thus concentration of ownership as proxied by percentage ownership of largest shareholder does not have an impact on corporate capital structure decisions.

5.3.3.The Dynamic Model

The static model assumes that adjusting leverage towards the optimal capital structure is costless. However, in the presence of adjustment costs there is a possibility that there is a lag in adjusting towards the desired leverage ratio (Myers, 1977, Fischer et al, 1989). Do Zimbabwean firms adjust to their new desired capital structure immediately as assumed in the previous capital structure model? In this section, we use a dynamic adjustment model and panel data methodology on a sample of Zimbabwean firms to examine the determinants of a time-varying optimal capital structure. The sample period is from 1995 to 1999. The empirical model is stated as follows.

$$y_{it} = \phi y_{i,t-1} + \beta x'_{it} + \eta_i + \lambda_t + \upsilon_{it} \qquad 5.7$$

where y_{it} is the debt ratio, x_{it} is a matrix of determinants that vary across firms and over time, η_i is a firm specific component, λ_t is a time specific component, and, υ_{it} is a stochastic error term, β are parameters to be estimated and ϕ (where; $0 \leq \phi \leq 1$) is

one less the speed of adjustment. In the absence of adjustment costs, ϕ will be equal to zero. In other words, the absence of adjustment costs means that the actual level adjusts to the desired level instantaneously. It can be seen that the set of right hand variables now include a lagged dependent variable. The assumptions underlying the above model are that, the error term is serially uncorrelated, N (the number of firms) is large while T (period of time) is small. In addition firm effects are assumed to be correlated with the lagged debt ratio. Therefore, the OLS estimator of the above parameters is inconsistent since the lagged dependent variable is positively correlated with the error term due to the presence of the firm effects. Nickel (1981) demonstrates that the within estimator does not remove the correlation between the transformed lagged dependent variable and the error term. Thus the within group estimator is also inconsistent in estimating dynamic panel data models. Bond (2002) argues that parameter estimates from OLS and within estimators are biased upwards and downwards respectively.

Instrumental variable estimation methods have been suggested in the econometric literature to be suitable for estimating dynamic panel data models. Anderson and Hsiao (1981,1982) have suggested a first differenced two stage least squares (2SLS) estimator. Recent developments include the GMM estimator of Arellano and Bond (1991).

To check for the potential misspecification of the model, we report 6 test statistics. The first Wald statistic (Wald1) tests for the joint significance on all regressors, except the dummy variables, under the null of no relationship between the dependent and the explanatory variables. The Wald test 2 statistic tests for the significance of all dummies (constant and time dummies). The Wald test 3 statistic tests for the significance of the time dummies. The fourth test statistic is the Sargan test of over-identifying restrictions, which tests for the validity of the instruments. The null hypothesis is that there is no correlation between instruments and error term, which means the instruments used are valid. Finally we report two F test statistics for autocorrelation. The first F statistic tests for first order autocorrelation under the null hypothesis of no serial correlation. The second F statistic tests for second order

autocorrelation of residuals under the null hypothesis of no second order serial correlation.

We use the GMM estimator to estimate the above dynamic model by considering two sets of right hand variables. Firstly, the set of right hand variables is comprised of the lagged debt ratio and the company characteristics considered in section 5.3. The regression results of which are presented in table 5.12 (a) below. This approach is similar to Guha-Khasnobis and Bhaduri (1998) and Miguel and Pindado (2001), However, this is not the only approach (see, Barnerjee, 2000, Bevan and Danolt, 2000, for other approaches).

Capital structure GMM Regression Results: Dynamic Model

Table 5.13a, n=51

Variable	Coefficient	t-statistic
$Debt_{t-1}$	0.4445	23.9
Tangibility	-0.3481	7.47
Profitability	-0.6543	5.41
Tax	-0.2606	6.08
Growth	0.0690	2.24
Liquidity	-0.1210	9.52
Largest	-0.1072	5.70
Constant	0.6995	13.6
Wald 1 (joint)	4124[0.00]	
Wald 2 (dummy)	201.8[0.00]	
Wald 3 (time)	64.43[0.00]	
Sargan test	42.74[0.396]	
F Test 1	-3.279[0.001]	
F Test 2	0.8114[0.417]	

The second approach that we use in this study is to include the lagged dependent and independent variables as well as the firm characteristics in the set of regressors. Although this approach is common in other research areas it was used by Ozkan (2001) in the capital structure literature. In this case our second approach is to re-

estimate the model with these regressors. However we restrict ourselves to the first lag of each variable. The regression results from this approach (model 2) are presented in table 5.12 (b) below.

Table 5.13b n =51, Capital structure GMM Regression results; dynamic model

Variable	Coefficient	t-statistic
$Debt_{t-1}$	0.3808	15.6
Tangibility	-0.4060	9.42
Profitability	-0.5443	4.71
Taxation	-0.2734	5.02
Stockliq	0.2378	3.62
$stockliq_{t-1}$	-0.1335	4.05
Liquidity	-0.1347	7.29
Insider	-0.6909	5.81
$insider_{t-1}$	0.6769	4.65
Largest	0.7580	6.16
$largest_{t-1}$	-0.8110	7.07
Constant	0.7014	11.00
Wald 1	4223[0.00]	
Wald 2	543.3[0.00]	
Wald 3	59.75[0.00]	
Sargan test	40.51[0.737]	
F Test 1	-3.302[0.001]	
F Test 2	1.172[0.241]	

The regression results from models 1 and 2 show that the misspecifications tests, discussed above, are all satisfied in both models. The Wald statistic for the joint significance of regressors, is significant, in both models, even at the 1 per cent level. Although time dummies are jointly significant at the 1 per cent level, the t statistics

for the three years 1997, 1998 and 1999 show that it is the year 1998 only that has a significant coefficient. The Sargan tests for both models are insignificantly different from zero and thus leading us to accept the null hypothesis that the variables used as instruments in the GMM estimation are appropriate. As expected the F tests for first order autocorrelation in residuals provide evidence of negative first order serial correlation. However, the F tests for second order autocorrelation are positive and insignificant at any conventional level of significance.

The GMM estimates show that most of the estimated coefficients have similar signs but different magnitudes to the results from the static model. The estimated coefficient for the lagged leverage is positive and highly significant in both models. The estimated speed of adjustment factor towards the optimal capital structure that is defined as $(1-\phi)$ is higher in model 2 (0.62) than in model 1 (0,56). Thus we find evidence of the existence of transaction costs. The estimated speed of adjustment costs in model 1 is similar to that of the UK corporate sector as reported by Ozkan (2001). However,Miguel and Pindado (2001) report an adjustment factor of 0.79 for the Spanish data. Guha-Khasnobis and Bhaduri (2000) report values of 0,62 and 0,23 for short term and long term leverage respectively.

A possible explanation for the differences in these factors is probably due to different measures of leverage employed in the specific country. For example, in the Spanish study leverage is defined as, "the ratio between the market value of long term debt and the market value of equity plus the market value of long term debt" Miguel and Pindado (2001) p.85. We now turn to a discussion of the estimates of the exogenous variables.

The coefficient on tangibility is negative and significant in both models and as discussed in section 1, above, this is contrary to Williamson's (1988) hypothesis that firms with more tangible assets use them as collateral. The coefficient on profitability is also negative and statistically significant. Thus we find evidence for pecking order financing for both static and dynamic models. The magnitude of the coefficient on the tax variable in model 1 is comparable to that of model 2.The relationship between tax and leverage is negative and significant. Thus we find evidence that corporate tax has a negative impact on borrowing decisions, a result contrary to the Modgliani and Miller 's (1963) prediction.

For the dynamic model 1 we find evidence that growth has a positive impact on capital structure decisions. This relationship is insignificant in the static model, therefore by estimating a dynamic model we have been able to find evidence of the impact of growth opportunities on leverage. Stock liquidity has a positive effect on borrowing decisions (model 2). However, the lagged stock liquidity coefficient is negative such that the overall effect although still positive is reduced from 0,24 to 0,11. The results show that liquidity in both models has a negative impact on leverage. Insider ownership negatively related to leverage while lagged inside ownership is positively related to leverage. The overall effect in the dynamic model is –0,01 compared to –1,06 in the static model. The relationship between largest and leverage is negative in model 1 but positive in model 2. However in model 2 the lagged largest is negative such that the overall effect is negative (-0.05) which is half of the coefficient of reported in model1 (-0.11).

5.4 Differences in Financial behaviour of holding and non-holding firms in Zimbabwe

5.4.1. Introduction

This section examines the financial behaviour of holding and non-holding firms in Zimbabwe over the period 1994-99. A common feature of medium and large firms around the world is that they own and control one or more other companies and are therefore under an obligation to report consolidated financial statements aimed at presenting a true and fair view of the financial position and performance of the parent company and its subsidiaries. However, in some countries, medium scale firms are exempted from the requirement to produce consolidated accounts and it therefore implies that companies which report consolidated accounts (here after holding companies) are larger and more diversified than the ones that report individual accounts (here after non-holding companies).

In their study of capital structure, Rajan and Zingales (1995) find that firms that report consolidated accounts in Japan and Germany have much higher leverage ratios than firms that do not. Furthermore, they report that firms that consolidate are bigger and less profitable than companies that do not. This, therefore, suggests that the financial behaviour of holding (firms that consolidate) and non-holding (firms that do not consolidate) firms is different. In other words, the financial behaviour of firms that we observe depends, to a greater extent, on whether a firm is a holding company or not. Therefore, econometric investigation of firm behaviour should take these differences into account.

Dividing companies into holding and non-holding, therefore, raises the following interesting question: is the financial behaviour (in terms of balance sheet characteristics, debt policy, dividend policy, profitability, growth opportunities) of holding and non-holding companies the same?

The business strategy and organisation structure literature tends to suggest that holding and non-holding companies behave in different ways. The literature on business strategy has suggested theoretical arguments for corporate diversification and

merger, namely the market power, resource and agency views (see, Montgomery, 1994). The first two views are consistent with profit maximisation behaviour while the third view suggests that the motive for diversification is management empire building. In this case, if diversification has an impact on financial performance and reputation of firms, then we would expect capital structure decisions of holding and non-holding companies to differ significantly.

5.4.2. Data

The main aim of this section is to compare the financial performance and capital structure decisions of holding and non-holding firms listed on the Zimbabwe stock exchange over the period 1994-99. This period is chosen mainly because it is the period after economic liberalisation, where the decision to acquire and dispose subsidiaries could easily be implemented. Holding companies listed on the Zimbabwe stock exchange are required to report consolidated balance sheets, profit and loss accounts and cash flow statements, in addition to the balance sheet of the parent company. These holding companies normally have 100 % equity stake in 5-15 other companies. However, it is the holding company that is listed on the stock market and by 1999, no subsidiary company was listed on the stock market.

From the sample of 51 companies that we have, some firms started as non-holding companies in 1994, but acquired other firms after one or two years. On the other hand, some started as holding companies but later on disposed the subsidiaries after one or two years. All these firms, 4 in total, were deleted from the sample and therefore leaving a sample of 47 firms which could consistently be classified as holding or non-holding. Out of these 47 firms, 29 companies are classified as holding, while the remaining 18 are classified as non-holding. The 29 holding companies were ranked according to the number of subsidiaries that they control. We then selected the first 18 companies with the highest number of subsidiaries. The main reason for selecting the first 18 firms is to increase the gap, in terms of size, between the two groups of firms.

5.4.3.Descriptive statistics

Our first objective is to investigate whether holding companies consistently out-perform their non-holding counterparts or vice versa. In view of this aim 12 measures of accounting performance are calculated: The first group of ratios compare the relative profitability of holding and non-holding companies. These are return on capital employed (ROCE), operating profit margin (OPM) and turnover of net assets (SC). Return on capital employed is the ratio of operating income to net assets. Operating profit margin is defined as the ratio of operating income to sales and the turnover of net assets ratio is calculated as sales divided by net assets. The turnover of asset ratio is complemented by the ratio of sales to shareholders' equity (SFA).

The second group of ratios measure the relative solvency of holding and non-holding companies in terms of total debt, long-term debt and short-term debt divided by total shareholders' equity. We have used the debt-to-equity ratio because this is the mainly used measure of solvency in Zimbabwe. We also computed the current ratio (CR), defined as current assets divided by current liabilities, in order to compare the liquidity positions of these firms. Other ratios computed are the tax and investment ratios, calculated as ratio of tax paid to operating income and capital expenditure to net assets respectively. We also calculated a measure of size, namely the natural logarithm of total assets (size). The definitions of these ratios are presented in table 5.13 below.

Table 5.13 Definition of firm performance ratios

1.Net income before interest and tax divided by net assets	ROCE
2. Net income before interest and tax divided by sales	OPM
3. Sales divided by net assets	SC
4. Sales divided by shareholders' funds	SFA
5. Total interest bearing debt divided by shareholders' funds	TD
6. Long term interest bearing debt divided by shareholders' funds	LTD
7. Short term interest bearing debt divided by shareholders' funds	STD
8. Tax divided by net income before interest and tax	Tax
9. Capital expenditure divided by net assets	Invest
10. Current ratio divided by current liabilities	CR
11. Log (total assets)	Size1
12. Log (sales)	Size2

We first computed weighted averages of each of these ratios for holding and non-holding firms in each year and then for the whole period (1994-99). The main aim is to compare at aggregate level the financial performance of these two groups of firms. We examine whether there is a significant difference between their means and medians.

The results from the univariate analysis are summarised in tables 5.15(a)- (c) and 5.16 below. Tables 5.15(a), (b) and (c), respectively, show the aggregate financial performance of all, holding and non-holding companies in each year and for the whole period.[17]

[17] These ratios are weighted averages.

Table 5.14 (a) Average firm performance ratios, (All 36 firms)

Year	STD	LTD	TD	INVEST	ROCE	CR	PRMG	SC	SFA	TAX	SIZE1	SIZE2
1994	0.1145	0.1098	0.2243	0.1421	0.1595	1.5089	0.1269	1.2565	1.5588	0.2800	16.4887	16.4272
1995	0.1275	0.0747	0.2022	0.1714	0.1966	1.4694	0.1405	1.3990	1.7703	0.2290	16.7289	16.7386
1996	0.1987	0.0928	0.2916	0.1465	0.1840	1.4061	0.1160	1.5863	1.9964	0.2538	16.9703	17.0527
1997	0.1778	0.0903	0.2681	0.1272	0.1706	1.4877	0.1081	1.5778	2.0269	0.2590	17.3165	17.3879
1998	0.1960	0.0965	0.2925	0.1271	0.2749	1.5214	0.1357	2.0252	2.6529	0.3034	17.5959	17.8686
1999	0.1681	0.0864	0.2545	0.1584	0.2934	1.5945	0.1414	2.0750	2.8335	0.3186	17.9066	18.2335
1994-99	0.1708	0.0909	0.2617	0.1447	0.2340	1.5203	0.1311	1.7847	2.3281	0.2912	19.0789	19.2711

Table 5.14 (b) Average firm performance ratios, (18 holding firms)

Year	STD	LTD	TD	INVEST	ROCE	CR	PRMG	SC	SFA	TAX	SIZE1	SIZE2
1994	0.1671	0.1149	0.2820	0.1440	0.1714	1.3651	0.1107	1.5486	2.0057	0.2467	15.9357	16.058
1995	0.1854	0.0934	0.2788	0.1742	0.1958	1.3272	0.1145	1.7094	2.2965	0.2425	16.1616	16.3446
1996	0.1769	0.0794	0.2562	0.1492	0.1793	1.3371	0.0959	1.8692	2.4519	0.2269	16.3342	16.6074
1997	0.1913	0.1004	0.2917	0.1475	0.1787	1.4691	0.1008	1.7721	2.4692	0.2301	16.7314	16.919
1998	0.2711	0.0823	0.3534	0.1276	0.2433	1.4491	0.1079	2.2551	3.1050	0.2654	17.0436	17.4096
1999	0.2057	0.0868	0.2924	0.1931	0.2731	1.5382	0.1357	2.0129	2.9301	0.3358	17.4756	17.7913
1994- 99	0.2084	0.0902	0.2986	0.1614	0.2256	1.4557	0.1163	1.9399	2.6913	0.2836	18.5495	18.8261

Table 5.14 (c) Average firm performance ratios, (18 non-holding firms)

Year	STD	LTD	TD	INVEST	ROCE	CR	PRMG	SC	SFA	TAX	SIZE1	SIZE2
1994	0.0443	0.1171	0.1614	0.1439	0.1261	1.9256	0.1846	0.6831	0.8178	0.3186	15.4167	14.8319
1995	0.0519	0.0567	0.1085	0.1716	0.1887	1.7994	0.2258	0.8358	0.9974	0.1812	15.7011	15.2732
1996	0.2301	0.1158	0.3460	0.1479	0.1772	1.5054	0.1662	1.0661	1.2932	0.2683	16.0523	15.7361
1997	0.1669	0.0850	0.2519	0.1027	0.1359	1.5176	0.1165	1.1667	1.3593	0.2714	16.2961	16.0941
1998	0.0912	0.1296	0.2208	0.1267	0.3157	1.6933	0.2010	1.5706	1.9685	0.3423	16.5321	16.6139
1999	0.1056	0.0949	0.2004	0.0846	0.3099	1.7494	0.1540	2.0120	2.4715	0.2843	16.6037	16.9063
1994-99	0.1200	0.1013	0.2213	0.1218	0.2302	1.6658	0.1682	1.3688	1.6600	0.2916	17.9781	17.9436

Table 5.15 presents a comparison of firm characteristics for holding and non-holding firms. To measure the significance level of the differences, we use a two tailed t-test (t-statistic) and a nonparametric Mann-Whitney test (Z-score). The results show that there are several similarities between holding and non-holding firms. Profitability, tax paid and tangibility of these firms are very close.

However, the mean debt-equity ratio, 0.29 for holding firms is significantly different from 0,21 for the non-holding firms. This finding is in line with the results of Rajan and Zingales (1995) for Japan and Germany.

Table 5.15 Differences in financial ratios of holding and non-holding firms in Zimbabwe (1994-1999)

	Holding companies 18		Non-holding Companies		Significance	
Variable	Mean	Median	Mean	Median	Mean	Median
LEVERAGE	0.2924	0.2868	0.2148	0.2106	2.172	-2.082
					(0.055)	(0.037)
PAYOUT	0.3508	0.3722	0.3768	0.4260	-0.545	-2.882
					(0.598)	(0.004)
SIZE2	16.855	16.7632	15.9093	15.9151	2.257	-1.761
					(0.048)	(0.078)
PROFIT	0.142	0.1318	0.1488	0.1342	-0.286	-0.320
					(0.781)	(0.749)
PRMG	0.1109	0.1093	0.1747	0.1754	-3.847	-2.722
					(0.003)	(0.006)
SC	1.8612	1.8206	1.2224	1.1164	2.839	-2.082
					(0.018)	(0.037)
SFA	2.5431	1.4606	1.4846	1.3263	3.482	-2.242
					(0.006)	(0.025)
CASH	0.007517	0.06977	0.004809	0.04419	3.218	-2.402
					(0.009)	(0.016)
LIQUIDITY	1.4143	1.4071	1.6984	1.7213	-3.776	-2.562
					(0.004)	(0.010)
TANGIBILITY	0.5596	0.567	0.5371	0.5346	0.544	-0.480
					(0.598)	(0.631)
TAX	0.2579	0.2446	0.2777	0.2778	-0.705	-1.281
					(0.497)	(0.200)
INVEST	0.156	0.1484	0.1296	0.1353	2.172	-1.601
					(0.055)	(109)

The results for the dividend payout ratio are mixed. Using the parametric test, the results suggest that the payout ratios of holding firms are not statistically different from their non-holding counterparts. The nonparametric test, however, shows that non-holding firms have higher payout ratios.

We also find statistical evidence to support the view that firms that consolidate are larger than firms that do not. The results also show that there is a significant difference in cash flow between holding and non-holding firms. Holding firms have higher mean/median cash flows (0,008/0,07) than non-holding firms (0,005/0,04).

However, the liquidity position of non-holding firms is better than that of holding firms. The mean current ratio of non-holding firms is 1,7, compared with 1,4 for holding firms. This difference is statistically significant at the 1 per cent level of significance. Finally, the results show that, there is a significant difference in the amount spent on investment by the two groups of firms. Capital expenditure for holding firms is higher, though the level of significance is statistically weak. The mean capital expenditure for holding firms is 0,16 compared to 0,13 for non-holding firms.

5.4.4.Capital structure of holding and non-holding firms

To further understand the effect of consolidation on corporate financial behaviour, we estimate the capital structure model. The major objective is to investigate whether the determinants of financial structure of holding firms differ significantly from their non-holding counterparts. In this regard, we estimate the following regression model:

$$y_{it} = \alpha + x'_{it}\beta + \mu_{it} \qquad 5.8$$

with $\mu_{it} = \eta_i + \lambda_t + \upsilon_{it}$

where y_{it} is the debt ratio, defined as total debt scaled by book equity, x'_{it} is a vector of determinants that vary across firms and over time. These variables are payout, tangibility, tax, profitability, growth, liquidity and size. The error term μ_{it}, is

decomposed into a firm specific component η_i, a time specific component, λ_t and a component that varies across firms and over time, υ_{it} and α, β, are parameters to be estimated.

First we use ordinary least squares to investigate whether coefficient estimates of the regressions for the two groups of firms are significantly different. A Wald test, under the null hypothesis that parameter estimates in the two regressions are similar, is employed to test this hypothesis. The Wald test is valid if the two samples are reasonably large and independent. In small samples the Wald test has the undesirable property that it too often rejects the null hypothesis.(see, Greene, 2000). Following Greene (2000), suppose θ_H and θ_{NH}, are parameter estimates from holding and non-holding regressions with covariance matrices V_H and V_{NH} respectively. Then, the null hypothesis that the two coefficient vectors have the same expected value implies that $E[\theta_H - \theta_{NH}] = 0$ and $E[\theta_H - \theta_{NH}]^2 = V_H + V_{NH}$ $V_H + V_{NH}$. Thus the Wald test statistic, $W=(\theta_H - \theta_{NH})'(V_H + V_{NH})^{-1}(\theta_H - \theta_{NH}) \sim \chi^2_k$, where k is the number of parameters estimated. This Wald test statistic for the regression results presented in table 5.16 is 51.3664 with a p-value of 0.000. Thus, this statistic rejects the hypothesis that the coefficient vectors are the same in the two regressions.

Table 5.16 OLS results and Wald test statistics

Variable	All firms	Holding firms	Non-holding firms	Wald test statistics
Constant	-0.4339	0.2440	-1.0623	12.6655
	(1.24)	(0.5139)	(2.77)	(0.0004)
Payout	0.0561	0.0018	0.1737	0.0749
	(1.36)	(0.0311)	(1.99)	(0.7844)
Tangibility	-0.5147	-0.7322	-0.3019	7.9615
	(2.49)	(3.31)	(1.91)	(0.0048)
Tax	-0.0143	-0.1368	-0.0076	17.2802
	(3.48)	(1.16)	(1.00)	(0.000)
Profitability	-0.6422	-1.3482	-0.4265	17.3946
	(2.20)	(2.45)	(1.70)	(0.000)
Growth	0.0245	0.1327	-0.0032	20.3554
	(0.831)	(1.32)	(0.080)	(0.000)
Liquidity	-0.0673	-0.2142	0.0440	9.7355
	(1.49)	(3.37)	(0.993)	(0.0018)
SIZE1	0.0852	0.0716	0.1012	10.8597
	(4.26)	(2.05)	(3.80)	(0.0010)
R^2	0.20	0.27	0.25	-
$\chi^2_j(7)$	78.69	25.97	23.19	-
	[0.00]	[0.001]	[0.002]	

Notes
In parentheses are absolute t-statistics values
In square brackets are p-values

However, as argued above, the regression results in table 5.17 are based on an estimator that ignores firm and time specific effects. Therefore the next procedure is to test for the significance of these effects, the results of which are presented in table 5.17. These results show that firm effects are significant while time effects are not. We therefore re-estimate the capital structure equations by an estimator that takes into account firm effects. In this section we choose the within estimator and the regression results for all, holding and non-holding companies are presented in tables 5.18 a, b, and c respectively.

Table 5.17. Tests for the significance of firm and time effects

	Null hypothesis	Test statistic	Statistic distribution	p-value
Panel A; All companies (n=36)				
Firm and Time effects	$\eta_i = \lambda_t = 0$ $\forall_i = 1,...36$ $\forall_t = 1,....5$	137.0	χ^2_{40}	0.00
Firm effects	$\eta_i = 0$ $\forall_i = 1,...36$	137.5	χ^2_{35}	0.00
Time Effects	$\lambda_t = 0$ $\forall_t = 1,....5$	1.994	χ^2_4	0.737
Panel B ; Holding companies				
Firm and Time effects	$\eta_i = \lambda_t = 0$ $\forall_i = 1,....18$ $\forall_t = 1,....5$	34.01	χ^2_{22}	0.049
Firm effects	$\eta_i = 0$ $\forall_i = 1,.....18$	34.80	χ^2_{17}	0.010
Time Effects	$\lambda_t = 0$ $\forall_t = 1,....5$	1.064	χ^2_4	0.900
Panel C; Non-holding companies				
Firm and Time effects	$\eta_i = \lambda_t = 0$ $\forall_i = 1,.....18$ $\forall_t = 1,....5$	183.1	χ^2_{22}	0.00
Firm effects	$\eta_i = 0$ $\forall_i = 1,...18$	176.6	χ^2_{17}	0.00
Time Effects	$\lambda_t = 0$ $\forall_t = 1,....5$	4.571	χ^2_4	0.334

Table 5.18 (a) Regression results from within estimator. (All companies, n = 36)

Variable	Coefficient	t-statistic
Payout	-0.0415	1.53
Tangibility	-0.4414	1.84
Tax	-0.0129	3.29
Profitability	-0.7766	2.83
Growth	0.0608	2.16
Liquidity	-0.1447	2.96
SIZE1	0.0422	1.53
R^2	0.17	
$\chi^2_j(7)$	39.40	
	(0.000)	

Table 5.18 (b) Regression results from within estimator (Holding companies, n = 18)

Variable	Coefficient	t-statistic
Payout	-0.0489	3.47
Tangibility	-0.7829	2.26
Tax	-0.0542	1.47
Profitability	-2.4675	4.71
Growth	0.2282	4.07
Liquidity	-0.2068	4.70
SIZE1	0.0761	2.12
R^2	0.28	
$\chi^2_j(7)$	87.88	
	(0.000)	

Table 5.18 (c) Regression results from within estimator (non-holding companies, n = 18)

Variable	Coefficient	t-statistic
Payout	0.017780	0.286
Tangibility	-0.5362	1.50
Tax	-0.0057	2.34
Profitability	-0.3942	1.63
Growth	0.0196	2.13
Liquidity	-0.0880	1.52
SIZE1	0.0074	0.209
R^2	0.22	
$\chi^2_j(7)$	240.00	
	0.000	

It is evident that there are substantial differences between estimates from holding and non-holding companies regressions. The regression results presented in table 5.18 b (holding companies) show that 4 out of 7 variables have the expected signs and only one variable (tax) is insignificant. In fact the signs of the variables are not different from the results reported in the previous two sections. We find that payout, tangibility, profitability and liquidity have negative effect on borrowing decisions, while growth and size have a positive impact.

On the other hand, the results in table 5.18 c (non-holding firms) show that 3 out of 7 variables have the expected signs and 4 variables (payout, tangibility, liquidity and size) are insignificant. Profitability and growth are the two variables that are significant in both regressions. Although, they have similar signs in both regressions of interest, their magnitudes are quite different. The coefficient on profitability in the holding equation is –0.9675 compared with –0.3942 in the non-holding equation. The coefficient on growth is 0.2282 in the holding equation, in comparison with 0.0196 in the non-holding equation. This shows that profitability and growth are sensitive to firm type.

The regression results in table 5.18 c show how regression results can be distorted by ignoring differences in firm reporting styles (consolidation or not). For example, in the non-holding equation payout and size have very small magnitudes, 0.0178 and

0.0074 respectively, that are not significant. However, in the holding regression equation payout and size have significant coefficients with magnitudes of –0.0489 and 0,0761 respectively. Combining the two groups of firms, results in insignificant coefficients of –0.0415 and 0.0422.

5.5. Summary and Conclusion

In this chapter a model of capital structure was estimated. The first empirical issue (section 1) was to investigate whether there was a structural change in parameters of the capital structure model. Using interactive regime dummies we found empirical evidence to suggest that the impact of taxation on corporate capital structures shifted in 1980. A possible explanation is that the government, with the aim of redistributing income, significantly changed the tax system in 1980. A document, known as 'growth with equity' was produced in 1980, which resulted in tax rates reaching the highest levels in Zimbabwean history. The results also indicate that the effect of liquidity and firm size on capital structures during the reform was significantly different from the other two regimes. The results from the two way fixed effects estimator show that size, tangibility and growth have a significant positive impact on leverage, while taxation, liquidity and profitability have an inverse effect. Thus the proposition of Modigliani and Miller (1963) that higher tax rates encourage borrowing is not supported by the Zimbabwean data. The results, however, support the pecking order hypothesis as suggested by Myers (1984). The results also support the prediction of Williamson (1988) that firms with tangible assets should be able to support more debt. We do not find empirical evidence to support DeAngelo and DeAngelo (1980) hypothesis.

In order to check for robustness of the results from our capital structure model, in the second section, we re-estimated the model with more firms (51 firms) but concentrating on a shorter period (1995-1999). Using the recent developments in the econometric literature, we estimated a static and dynamic model of capital structure. For the static model, we experimented with 5 alternative measures of leverage and judging from the adjusted R-squared, the results show that the ratio of total liability to book equity is a better proxy for leverage in Zimbabwe. This is in line with the observation that, this measure is widely used in Zimbabwe. The results from the static

model also show that the major determinants of capital structure are tangibility, profitability, taxation, non-debt tax shield, stock liquidity, liquidity and insider ownership. Only stock liquidity has a positive impact on leverage ratio. Tangibility, profitability, taxation, non-debt tax shield, liquidity and insider ownership, on the other hand, adversely affect the decision to borrow. Thus the results from the static model support the following hypotheses: (i) the pecking order hypothesis that firms prefer internal financing to external financing, (ii) the trade-off hypothesis that non-debt tax shields reduce the expected gains from leverage, (iii) firms use liquid assets to finance investments and (iv) the agency cost hypothesis that increasing managerial ownership helps to align the interests of managers and shareholders and therefore reduces the role of debt as an agency-conflict mitigating factor.

On the other hand, the results do not support the two trade-off hypotheses: (i) firms' collateralisable assets provide security to lenders in the event of financial distress, and (ii) corporate taxation encourages corporations to finance their investments by debt. Finally the regression results show that payout ratio, firm growth, firm size and blockholders do not have a significant influence on corporate capital structures in Zimbabwe.

The empirical results from the dynamic model seem to suggest that firms in Zimbabwe have long-run target leverage ratios and adjust to this ratio at a relatively fast rate. The results also provide evidence of a negative relationship between leverage and tangibility, a result contrary to the theoretical prediction. The results also do not support the expected effect of taxation on capital structures. However, the results show that firms prefer internal finance to external finance as predicted by the pecking order hypothesis. Capital market conditions captured by the stock liquidity variable has a positive impact on leverage, possibly reflecting the view that firms float their shares in order to be famous (if their shares perform very well) and thus enabling them to borrow more. However, past stock liquidity adversely affects leverage. Liquidity has a negative effect on leverage, maybe firms use liquid assets to finance investments. Insider ownership adversely affects borrowing decisions and a possible explanation is that firm managers dislike debt financing since it increases firm risk. However past insider ownership has a positive impact on leverage.

In the third section, we have compared the financial performance and capital structure decisions of holding and non-holding listed firms in Zimbabwe over the period 1995 to 1999. The descriptive statistics show that profitability, tax paid and tangibility of these firms are very close. However, there are significant differences in leverage, size, cash flow, liquidity, and capital expenditure between holding and non-holding firms.

The results from the Wald test statistics suggest that the determinants of capital structure decisions differ significantly between the two groups of firms. The results from the within estimator show that 6 out of 7 determinants significantly explain variation in leverage ratios across holding firms, while only 3 out of the 7 variables are important in explaining capital structure decisions of non-holding firms. This implies that the variables suggested in the finance literature as major determinants of capital structure are more applicable to larger firms rather than small firms.

Thus the results discussed above, show that using different estimation period and sample size and even disaggregating data does not change the relationship between leverage and profitability, tax and liquidity.

Chapter 6- Dividend Policy and Behaviour in Zimbabwe

6.1 Introduction

This chapter extends the empirical literature on corporate dividend policy practices in emerging markets by investigating the major determinants of dividend decisions of listed firms in Zimbabwe. The firm's liquidity position, cash flow and profitability have long been regarded as the key determinants of dividend policy (Linter, 1956, Darling, 1957 and Brittain, 1966). These studies have shown that when a firm faces financial constraints, managers are most likely to limit the growth of dividends since cash dividends can only be paid out of profits rather than out of paid up capital. Consistent with this prediction, the recent research in empirical finance has documented a strong influence of firm annual loss and cash flow on firms' dividend behaviour (see,Charitou, 2000). Annual loss has been shown to have a strong negative impact on the level of dividend payment and the decision to pay dividends.

On the other hand, empirical evidence documents a positive relationship between cash flow and dividend payout ratio. Furthermore, the finance literature argues that firms constrained from obtaining external finance, because of asymmetric information problems, will heavily rely on internal funds to finance investment and dividends and will consequently maintain low dividend payout policies (Vogt, 1994). Tax and agency factors have also been found to have a great influence on dividend policy (see Allen and Michaely, 1995). However, these findings are inconsistent with the Miller and Modigliani's (1963) irrelevant theorem.

Dividend policy literature to date (see Lease, et al, 1999) suggests that dividend policy decisions tend to occur at discrete intervals, especially in countries like Zimbabwe, where dividends are paid twice per year. Furthermore, there has been little attempt in the literature to identify potential determinants of five related decisions: decision to pay, omit, increase, maintain or reduce dividends. It is, therefore, possible to gain some insights into the dividend policy decision if discrete choice methodology is employed to investigate the key determinants of these five decisions.

The major objectives of this section are twofold: first, to document the pattern and evolution of dividend policy in Zimbabwe over the past 25 years; second, to empirically investigate the main determinants of dividend policy of the Zimbabwean corporate sector over the past 5 years. The empirical evidence we provide in this section is an attempt to answer the following questions: (i) what percentages of firms' profits are paid out as dividends and how does this pattern of dividend payout compare with evidence from developed countries; (ii) is there a significant change in aggregate payout ratios across the three economic regimes; (iii) what determines the level of dividends firms pay; (iv) what determines the firm's decision to pay and not pay (omit) dividends; (v) what determines the firm's decision to increase maintain and reduce dividends.

The rest of the section is structured as follows. In section 2 we empirically examine the patterns of dividend payments. In section 4 we present econometric evidence on dividend behaviour and section 5 concludes.

6.2 Empirical Dividend Patterns of Zimbabwean firms

6.2.1 Historical payment of dividends

The main aim of this section is to document the historical pattern and evolution of dividends of listed firms in Zimbabwe for the period 1975 to 1999. The data is obtained from financial statements (balance sheets, Profit and Loss account and cash flow statements) of non-financial firms listed before 1975. All companies that have been de-listed or with incomplete data set were excluded resulting in a sample of 32 companies. This represents about 90 % of non-financial companies listed before 1975 and whose shares are still traded on the Zimbabwe Stock exchange.

The first step in the research is to test the universally accepted hypothesis that dividend payments are smoother than earnings. In order to test this hypothesis we computed standard deviations of dividend payments and after tax profits, dividend per share, and earning per share series. These results were supplemented by time series plots of dividend per share and earning per share.

The descriptive statistics reported in table 6.1 indicate that dividends are less volatile than earnings.

Table 6.1 Descriptive statistics

	Mean	Maximum	Minimum	Standard deviation
Dividend (1975-99)	315731	1814911	14668	462907
Profit (1975-99)	791449	5913139	19854	1328275
Dividend per share (1975-99)	21	77	8	16
Earnings per share(1975-99)	47	207	11	43
Pay out ratio(1975-99)	40	74	31	13
Pay out ratio(1975-79)	56	74	47	7
Pay out ratio(1986-90)	36	42	33	10
Pay out ratio(1995-99)	38	58	31	11

The standard deviation is Z$463 thousand for dividends, compared to Z$1328 thousand for after tax profit. The standard deviation of dividend per share is 16%, which is smaller than 43% of earnings per share. Dividend yield has a smaller standard deviation (2%) than earnings yield (10 %).

Fig 6.1

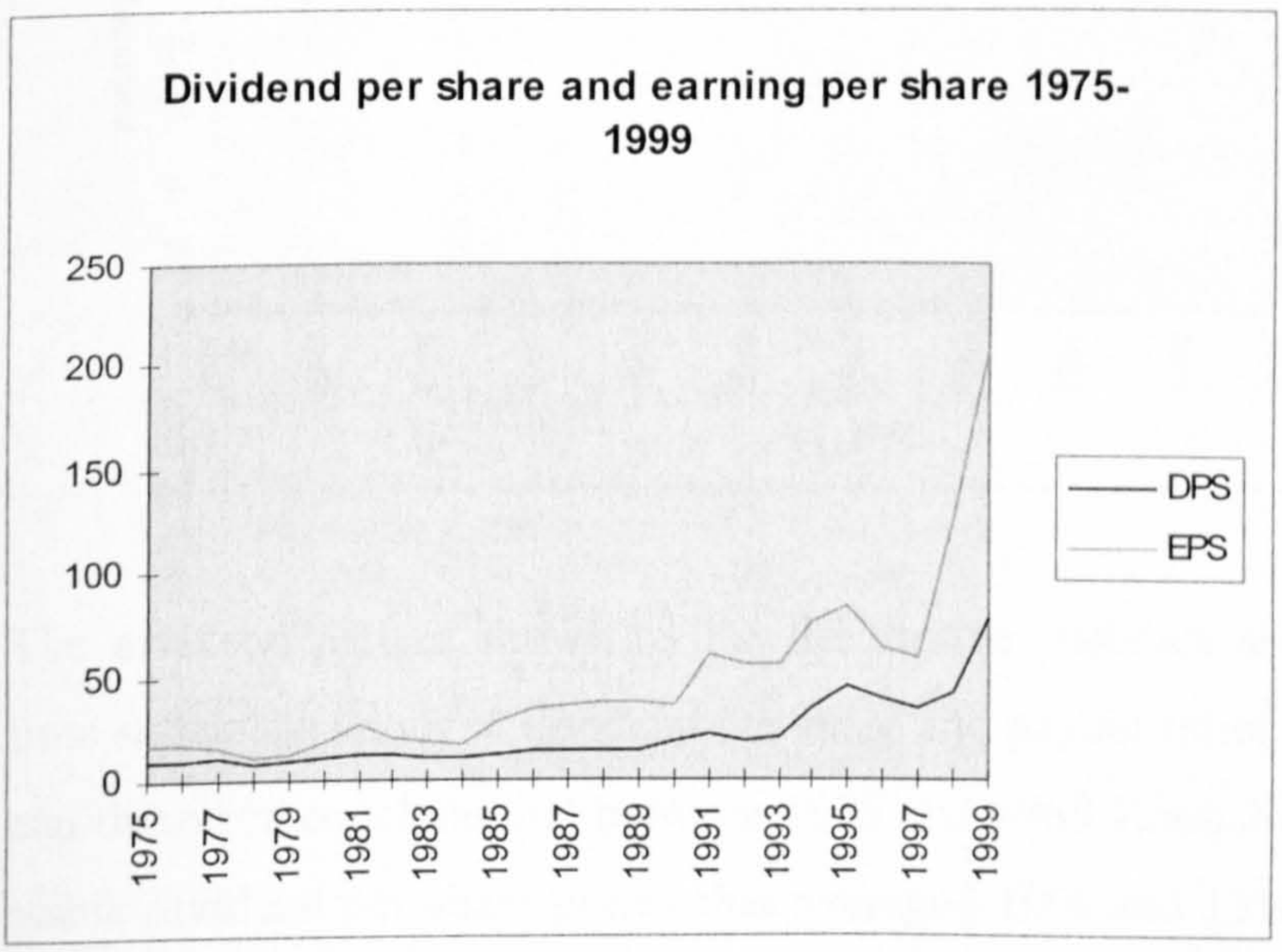
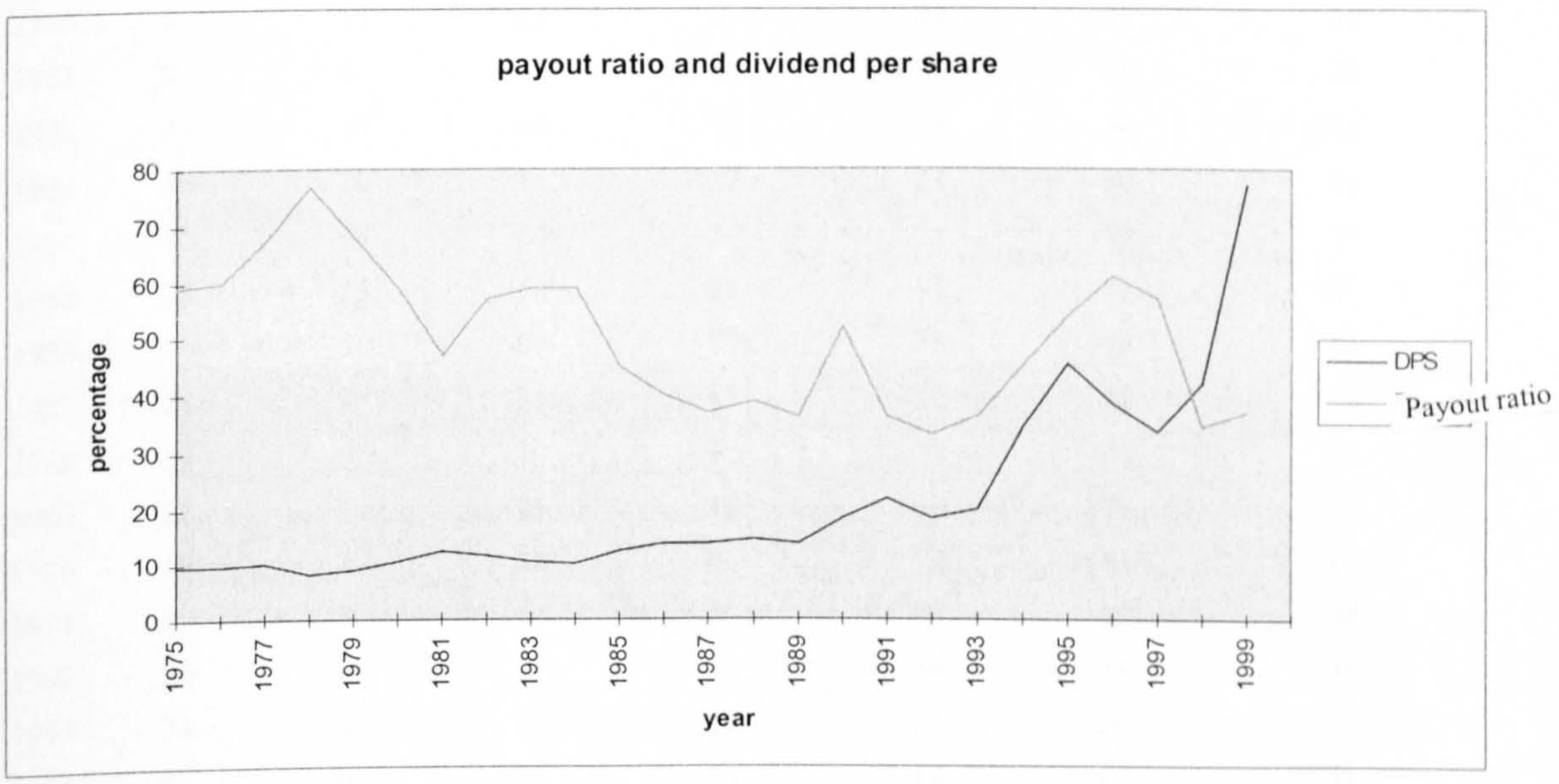


Figure 6.1 shows the time series of dividend per share and earnings per share between 1975 and 1999. It is evident that the dividend per share series is less volatile than the earnings per share series especially before 1990. Therefore there is evidence to

support the hypothesis that dividends follow a smoother path than earnings in the Zimbabwean context.

The second step in the research is to explore whether the companies in the sample follow a stable dividend per share policy, gradually rising dividend policy or constant payout policy. In this case we compare the behaviour of the dividend per share and payout ratio series. The results in table 1 show that between 1975 and 1999 the standard deviation of the payout ratio (13%) is smaller than that of dividend per share (16%). However, these standard deviations are different across the three regimes. The standard deviation of payout ratio is 7%, 10% and 11% during the UDI, independence and ESAP respectively. The corresponding standard deviations of dividend per share are 0.8%, 3% and 18%. This shows that during the UDI, dividend payment was smoother than in any other period.

Fig 6.2



The dividend pattern shown by the descriptive statistics are also confirmed by the time series behaviour of dividend per share and payout ratios shown in figure 6.2. We can therefore conclude that between 1975 and 1989 Zimbabwean firms maintained a stable dividend per share policy that averaged 10% and 13% in the1970s and 1980s respectively. These results are in line with the survey results by Byskes (1974). The more erratic behaviour of the dividend per share series in the 1990s is probably explained by the removal of dividend payment restrictions during this period of

economic reforms. The results also suggest that after the financial reform, firms now pay more attention to the payout ratio rather than dividend per share.

The third step is to examine the relationship between changes in income and dividend payment.

Table 6.2 The proportion of firms cutting, omitting, increasing or maintaining dividends

Account year	Firms cutting dividends	Firms omitting dividends	Firms cutting or omitting dividends	Firms maintaining dividends	Firms increasing dividends	Firms maintaining or increasing dividends	Firms paying dividends and issuing equity
1976	22	9	31	41	38	79	13
1977	31	19	50	19	50	69	16
1978	25	19	44	41	34	75	19
1979	9	13	22	25	66	91	25
1980	9	13	22	6	84	90	34
1981	9	6	15	16	75	91	38
1982	47	19	66	16	38	54	28
1983	50	16	66	22	28	50	13
1984	41	19	60	34	25	59	19
1985	25	25	50	22	53	75	9
1986	6	3	9	6	88	94	19
1987	28	3	31	13	59	72	16
1988	19	0	19	9	72	81	16
1989	22	3	25	16	63	79	19
1990	19	3	22	9	72	81	19
1991	3	3	6	3	94	97	38
1992	31	6	37	13	56	69	31
1993	34	13	47	13	53	66	25
1994	3	9	12	13	84	97	41
1995	13	3	16	9	78	87	41
1996	31	6	37	6	63	69	34
1997	38	9	47	6	56	62	47
1998	28	9	37	3	69	72	34
1999	13	9	22	9	78	87	34

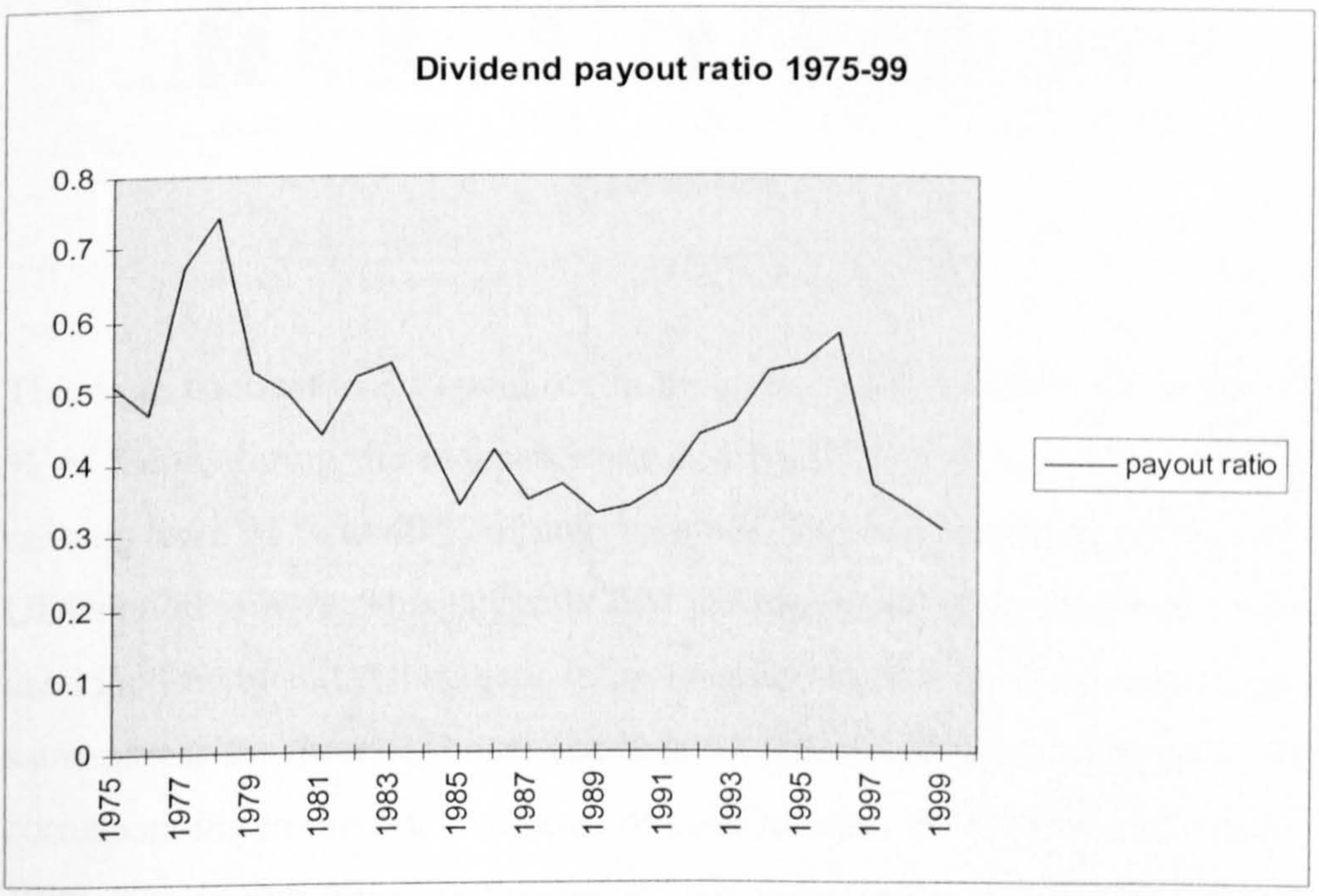
Table 6.3 The proportion of firms reporting loss, increase and decrease in profit

Account year	Loss	Profit increase	Profit decrease
1976	0	59	38
1977	9	47	47
1978	13	44	53
1979	6	91	9
1980	3	84	16
1981	6	78	22
1982	13	50	50
1983	19	28	72
1984	13	50	47
1985	3	72	25
1986	3	91	9
1987	3	75	25
1988	0	66	34
1989	3	75	25
1990	6	81	19
1991	6	94	6
1992	3	59	41
1993	3	53	47
1994	6	91	9
1995	9	69	31
1996	3	59	41
1997	3	69	31
1998	3	84	16
1999	0	91	6

53% of the companies did not omit dividend payment for the period 1975-99.

Table 6.2 shows the proportion of firms cutting, omitting, maintaining or increasing dividend payment and table 6.3 shows the percentage of firms reporting loss, decrease or increase in after tax profit from 1975 to 1999. The first observation is that, the proportion of firms either maintaining or increasing dividends is quite high and comparable to other studies in developed countries. For example, 84% and 63% of UK firms maintained or increased dividends in 1988 and 1992 respectively[18]. The corresponding percentages for Zimbabwean firms are 81% and 69%. The second observation is that an increase in dividends (table 6.2 column 6) is paralleled by an increase in profit (table 6.3 column 3) and thus supporting the hypothesis that net income is the major determinant of dividend changes (Linter, 1956 and Allen, 1995). The third observation is that the proportion of firms simultaneously issuing new equity and paying dividends has substantially increased after the reform programme. It averaged 36% between 1991 and 1999, compared to 16% between 1983 and 1990. A possible explanation is that the financial reform has made it easy for firms to access capital markets and most firms can therefore afford to pay dividends and issue new equity at the same time. Another explanation is related to the tax argument. The capital gains tax rate applicable to gains arising from the disposal of securities listed on the Zimbabwe Stock Exchange was reduced from 30 % in 1990 to 10 % and thus reducing the gap between capital gains and dividend tax rates.

Fig 6.3

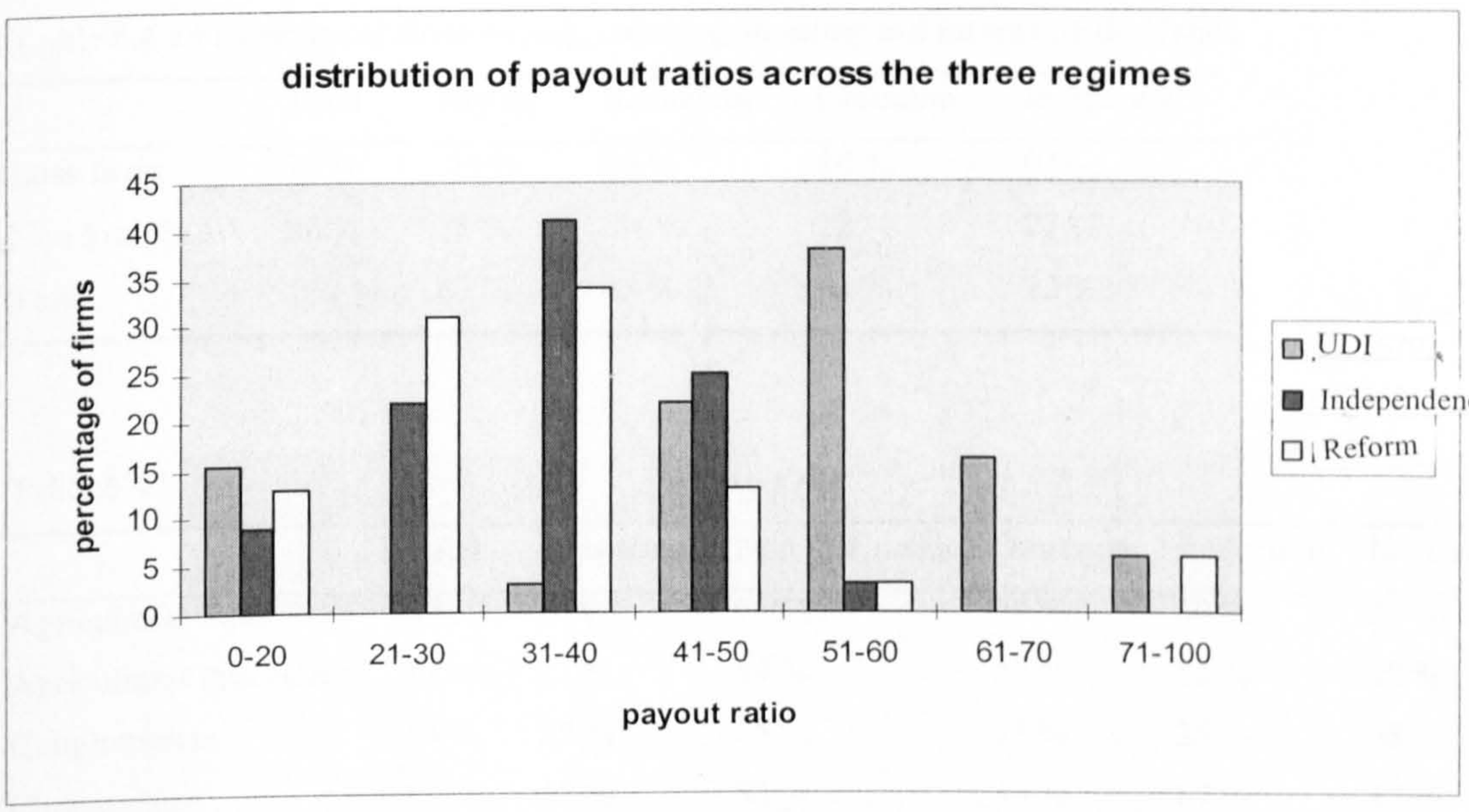


[18] Bank of England Quarterly Bulletin August 1993.

The fourth step is to examine the behaviour of the payout ratio between 1975 and 1999. Figure 6.3 shows that the highest ratio was paid in 1978 (74 %) while the lowest was paid in 1999 (31 %). The average payout ratio for the whole period is 40 % compared to 56 %, 36 % and 38 % during UDI, Independence and ESAP respectively.

Furthermore, the frequency distribution of firms over different payout classes across the three regimes (figure 6.4) shows that during the UDI period, approximately 38% of the firms in the sample paid dividends ranging from 51 % to 60 % of their after tax earnings.

Figure 6.4



This is in contrast to 3 % paid out in the period 1980 to 1999. However, 41% and 34 % of firms, during the independence and ESAP period respectively, paid dividends ranging from 31 % to 40 % of their incomes. The corresponding proportion during the UDI period is 3 %. This suggests that the payout ratio has declined since 1980. We used the Friedman t test statistic to investigate whether the dividend payout ratio is the same across the three regimes. The data set was divided into three equal sample sizes corresponding to the last five years of each regime; 1975-1979, 1986-1990 and 1995-1999. The results from the Friedman t test indicate that significant differences in the level of dividend payout across the three regimes do not exist ($p<0.18$).

6.2.2 Loss and dividend payment

Another issue that we document is the impact of loss on dividend behaviour. However, the empirical literature that has examined this issue is based on a large sample, for example; the sample sizes of DeAngelo et al (1992), Charitou, (2000), and Ho and Wu, (2001), studies are 607, 529 and 354 respectively. In order to increase our sample size, we therefore use unbalanced data (51 firms) for the period 1995-99. Dividend omission (reduction) is defined as the event that a firm omits (reduces) cash dividend in at least one accounting year during the period 1995-99. On the other hand paying (increasing) dividends is defined as the event that the firm pays (increases) dividends in each accounting year during the period 1995-99. We also seek to document inter industry payout ratios.

T able 6.4 a Proportion of firms paying, reducing, omitting and increasing dividends

	Total	Paying	Reduction	Omission	Increasing
Loss firms	20 %	20 %	20 %	80 %	0 %
Non loss firms	80 %	78 %	51 %	22 %	27 %
Total	100 %	67 %	45 %	33 %	22 %

Table 6.4 b

	Total	Loss firms	Non loss firms	Omission	Reduction	Increasing
Agricultural input	8 %	0 %	100 %	25 %	50 %	25 %
Agricultural Processing	18 %	11 %	89 %	22 %	56 %	22 %
Conglomerate	16 %	25 %	75 %	25 %	25 %	38 %
Construction	12 %	17 %	83 %	33 %	67 %	17 %
Consumer goods	8 %	0 %	100 %	0 %	75 %	25 %
Mining	10 %	40 %	60 %	60 %	60 %	0 %
Retail	10 %	20 %	80 %	40 %	20 %	20 %
Other	20 %	30 %	70 %	50 %	30 %	20 %
Total	100 %	20 %	80 %	33 %	45 %	22 %

Table 6.4 shows that for the period 1995-99, about 20 % of the firms in the sample reported at least one annual loss and 80 % of these loss-making firms omitted paying dividends in the same period. However, 67 % of the firms in the sample never omitted paying dividends, but 45 % reduced the level of dividends while 22 % continued to

increase the level of dividends year after year. Nonetheless, 51 % and 22 % of non-loss firms have respectively reduced and omitted dividend payment.

Table 6.5 shows payout ratios across the major industrial sectors. On average multinationals have the highest payout ratios (46 %) and the agricultural input sector has the least (26 %). Using the Friedman t test we find that there is a significant difference in payout ratios across the industrial sectors ($p<0.054$).

Table 6.5 Pay out ratios across industrial sectors

Year	All Firms	Agricultural Input	Agricultural Processing	Conglomerate	Construction	Consumer goods	Mining	Retail	Other
1995-99	0.37	0.26	0.30	0.46	0.36	0.31	0.45	0.36	0.31
1995	0.52	0.43	0.35	0.86	0.35	0.34	0.51	0.40	0.50
1996	0.55	0.16	0.42	0.85	0.33	0.42	0.47	0.37	0.55
1997	0.41	0.34	0.36	0.41	0.38	0.53	0.45	0.57	0.32
1998	0.33	0.20	0.29	0.44	0.35	0.24	0.35	0.45	0.31
1999	0.29	0.29	0.24	0.32	0.37	0.26	0.45	0.26	0.23

6.2.3 Summary

In summary, we have found that net income and losses have a significant impact on dividend changes. The percentage of firms issuing new equity and paying dividends in the same accounting year has substantially increased after financial reform. The aggregate payout ratio was very high in the 1970s and has drastically gone down. During the period 1995-99, all firms that have reported at least one annual loss have either reduced or omitted paying dividends. Therefore, the above observations give us an indication that annual loss, net income and the financial reform program have a significant impact on firms' decisions to change dividend policy. However, the finance literature suggests that other firm characteristics like firm size and growth are possible determinants of company dividend behaviour. We explore this issue in the next section.

6.3 Econometric Evidence on the Determinants of Dividend policy

6.3.1 Introduction

Recent research on company dividend behaviour is primarily based on data derived from companies operating in the US, UK and other developed countries (see Allen, 1995, Lease *et al*, 1999 for a review). The finance literature suggests that differential tax treatment between dividends and capital gains influences dividend behaviour and more recent models suggest that dividend payment has a signalling effect and can also mitigate the agency problems. However, the institutional characteristics in developed countries, on which these models are based, are different from those of developing countries. In particular, the tax structures, the degrees of information imperfection and transaction costs in developing countries are quite different from their developed counterparts. Therefore, the universally accepted dividend behaviour hypotheses initiated by Linter (1956) may be rejected by data derived from companies operating in developing countries. For instance, Glen's *et al* (1995) study of dividend behaviour in emerging markets reports that dividend and capital gains taxes have no impact on dividend policy decisions in developing countries. They also find that dividend payout ratios in emerging markets are lower than in developed countries.

The main aim of this section is to empirically examine the key determinants of dividend policy and the empirical procedure is divided into four sections. In the first part we test the Lintner model of corporate dividend behaviour. The second part investigates the determinants of the payout ratio using the fixed effects model. The third part examines the decision to pay or not pay using the binary choice model, while the fourth part makes use of the multinomial logit model to investigate the major determinants of the decision to change dividends (increase, maintain and reduce decisions).

6.3.2The Lintner Model

In this section we examine the dividend payment practices of Zimbabwean corporations by testing Lintner's(1956) stable dividend hypothesis. This hypothesis is based on two empirical observations; (1) corporate managers have a target payout

ratio which is a proportion of earnings and (2) dividend payment slowly adjusts towards the desired payout ratio.

As shown in chapter two, Lintner's econometric specification of corporate dividend behaviour hypothesises the change in dividends to be mainly explained by the current earnings and the lagged dividends. The literature reviewed in chapter two, suggests that the Lintner model describes well the dividend behaviour of firms operating in developed countries. However, it is not clear whether the lintner model is applicable to firms in emerging markets, therefore in this section we examine how well the Lintner's model describes dividend practices of firms in emerging markets.

6.3.2.1 Estimation procedure

The Lintner dividend model takes the form

$$D_{it} = \beta_0 + \beta_1 E_{it} + \beta_2 D_{t-1} + \mu_{it} \qquad 6.1$$

with $\mu_{it} = \eta_i + \lambda_t + \upsilon_{it}$

where D_{it} is dividend per share, E_{it} is earnings per share. The error term μ_{it}, is decomposed into a firm specific component η_i, a time specific component, λ_t and a component that varies across firms and over time, υ_{it}, β_0 and β_1, are parameters to be estimated. The parameter estimates from the above equation are expected to be positive, from which the adjustment factor δ and payout ratio ρ can be recovered as $\delta = 1 - \beta_2$ and $\rho = \frac{\beta_1}{\delta}$. As discussed in detail in chapter 3, there are several ways of estimating equation 6.1. In this section, we consider 4 alternative methods of estimating the Lintner model. These are OLS, Fixed effects, and two instrumental variables techniques (Anderson and Hsiao and GMM). The OLS method ignores firm and time specific effects. However, as discussed in the methodology chapter, this may seriously bias the results if these specific effects are significant. The fixed effects estimator, by including firm and time dummies, has been proved to mitigate this problem in regressions with exogenous right hand side variables. Thus once the lagged dependent variable is included in the vector of explanatory variables the regression results become inconsistent (Nickel, 1981). Bond (2002) argues that

parameter estimates from OLS and within estimators are biased upwards and downwards respectively. Instrumental methods have been suggested to mitigate these problems. In this section we consider two instrumental variable estimators, Anderson and Hsiao and the GMM of Arrellano and Bond (1991) (see Chapter 3).

We use data from a sample of 32 firms to estimate equation 6.1 as has been highlighted in the previous chapter we need to consider the possibility of structural shift in the parameters of the regression equations caused by changes in regimes. In this case we estimate two models. For model 1, we pool data across the regimes (1975-99), while for model 2, we estimate 3 separate equations for each regime. Model 1, which is of great interest, is estimated by 4 different estimators; OLS, Fixed effects, Anderson and Hsiao (AH) and GMM (1^{st} and 2^{nd} step). The regression equations for each regime are estimated by GMM.

Table 6.6 presents results from OLS, fixed effects, AH and GMM estimators. The results show that both firm and time effects are significant such that a method that takes into consideration these effects is more preferable.

To check for the potential misspecification of the dynamic model, we report 6 test statistics. The first Wald statistic (Wald1) tests for the joint significance on all regressors (DPS_{t-1}, EPS) except the dummy variables, under the null of no relationship between the dependent and the explanatory variables. The Wald test 2 statistic tests for the significance of all dummies (constant and time dummies). The Wald test 3 statistic tests for the significance of the time dummies. The fourth test statistic is the Sargan test of over-identifying restrictions, which tests for the validity of the instruments. The null hypothesis is that there is no correlation between instruments and error term, which means the instruments used are valid. Finally we report two F test statistics for autocorrelation. The first F statistic tests for first order autocorrelation under the null hypothesis of no serial correlation. The second F statistic tests for second order autocorrelation of residuals under the null hypothesis of no second order serial correlation.

Table 6.6(a) Empirical results for the Lintner model (32 firms)

Variable	Model 1 (1975-99) OLS	Model 2 (1975-99) Fixed Effects	AH 1975-99	GMM 1975-99 (1st Step)	GMM combined 1975-99 (2nd step)	Model 3 UDI (1975-79)	Model 3 Independence (1980-91)	Model 3 Reform (1992-99)
Constant	-1.257	5.5323	0.3742	0.1737	11.76	0.56	0.11	0.65
	(1.46)	(1.29)	(0.107)	(0.338)	(1.24)	(0.78)	(0.19)	(0.98)
DPS_{t-1}	0.3312	0.2457	0.1513	0.3106	0.3343	0.4138	0.2649	0.200
	(7.14)	(9.62)	(2.05)	(5.79)	(14.7)	(2.89)	(3.85)	(8.31)
EPS_t	0.3060	0.3290	0.3735	0.3383	0.2642	0.2681	0.2672	0.3453
	(6.89)	(33.6)	(24.4)	(6.83)	(9.36)	(4.27)	(7.92)	(8.25)
Target	0.4575	0.4362	0.4401	0.4907	0.3969	0.46	0.36	0.44
Payout $(\rho = \frac{\beta_1}{\delta})$								
Adj. Factor $\delta = 1 - \beta_2$	0.6688	0.7543	0.8487	0.6894	0.6657	0.59	0.74	0.80
R^2	0.83	0.85						
Wald1 joint (DPS,EPS)	561.1 [0.000]	2408 [0.000]	682.9 [0.000]	1216 [0.000]	1460 [0.000]	148.7 [0.000]	81.41 [0.000]	128.9 [0.000]
Wald2 Dummies	2.139 [0.144]	126.3 [0.000]	63.61 [0.000]	130.5 [0.000]	463.3 [0.000]	9.291 [0.054]	26.54 [0.003]	20.61 [0.008]
Wald3 Time Effects	-	43.26 [0.006]	-	128.0 [0.000]	268.4 [0.000]	5.745 [0.125]	26.53 [0.002]	10.48 [0.163]
Sargant test	-	-	-	620.8 [0.000]	3.205 [0.996]	30.03 [0.223]	14.78 [0.214]	20.46 [0.221]
F-Test Auto	0.8261 [0.409]	1.729 [0.084]	-9.463 [0.000]	-1.756 [0.079]	-1.719 [0.086]	-2.235 [0.025]	-1.773 [0.076]	-1.408 [0.159]
F-Test Auto	-	-	0.7008 [0.4483]	0.5117 [0.609]	0.6266 [0.531]	-1.281 [0.200]	-0.8509 [0.395]	0.6216 [0.534]

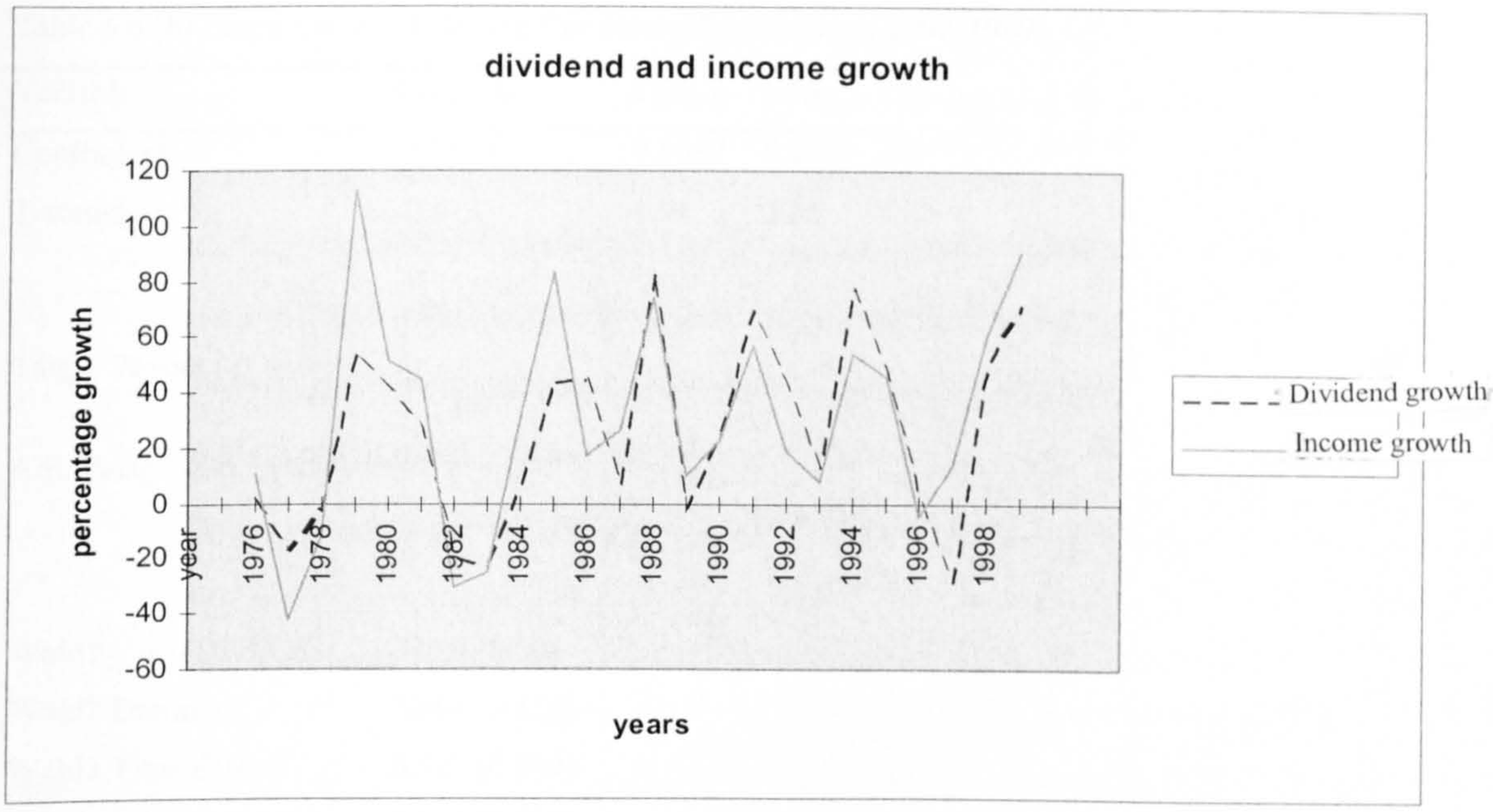
Notes
In parentheses are absolute t-statistics values
In square brackets are p-values

The Wald statistic for the joint significance of regressors, is significant at the 1 per cent level, in all equations. Although time effects are significant in most of the equations, they are not significantly different from zero in the UDI and Reform periods. A possible explanation is that these two periods have the shortest estimation periods, 5 and 8 years respectively. The Sargan tests for all equations are insignificantly different from zero and thus leading us to accept the null hypothesis that the variables used as instruments in the GMM estimation are appropriate. As expected the F tests for first order autocorrelation in residuals provide evidence of negative first order serial correlation. However, the F tests for second order autocorrelation are positive and insignificant at any conventional level of significance.

6.3.2.2 Empirical results

The regression results show that the constant in each of the models is insignificantly different from zero. Thus the hypothesis that corporate managers are reluctant to reduce dividends is rejected at the 10 per cent level. The coefficients on DPS and EPS have the expected positive signs and are significantly different from zero. The statistical significance of the D_{t-1} variable is an indication that dividend payment does not follow a random walk. It shows that current dividend payment, to some extent, depends on dividend payment in the previous year. We also computed, for each model, target payout ratio and adjustment factor. The adjustment factor ranges from 0.67 (GMM and OLS) to 0.85 (AH). These adjustment factors are close to 1 than zero. Thus the results show that firms in Zimbabwe do not smooth dividend payments. This is supported by the trend of changes in dividends and earnings shown in figure 6.5 below.

Figure 6.5



The estimated payout ratios range from 0.40 (GMM) to 0.46 (OLS) and this is consistent with the observed weighted dividend payout ratio of 0.40 over this sample period. We also examined dividend stability across the regimes. For this reason, we estimated three separate regressions using data from each regime (UDI, Independence and Reform periods). The results are reported in table 6.6 (a) (Columns 6-8) above. The results show that the coefficients of the variables of interest are positive and significant in each regime. The Lintner adjustment factors are respectively 0.59, 0.74 and 0.80 in the UDI, Independence and Reform periods. Thus, these results show that dividend instability was more pronounced in the reform regime as already shown by the results from the descriptive statistics.

On the other hand, the payout ratios of the UDI, Independent and Reform regimes are respectively 0.46, 0.36 and 0.44 compared to their respective weighted averages of 0.56, 0.36 and 0.38.

We also estimated the lintner model for 51 firms in the Reform regime using the GMM estimator and obtained the following results.

Table 6.6 (b) Empirical results for the Lintner model (51 firms; 1995-1999)

Variable	Constant	DPS_{t-1}	EPS_t
Coefficient	-1.7818	0.5087	0.1794
T-statistics	-0.673	1.94	2.55

Target Payout ($\rho = \frac{\beta_1}{\delta}$)	0.36
Adj. Factor $\delta = 1 - \beta_2$	0.492
Wald1 joint (DPS,EPS)	326.9 [0.00]
Wald2 Dummies	6.604 [0.158]
Wald3 Time Effects	6.527 [0.089]
Sargant test	2.325 [0.508]
F-Test Auto	1.632 [0.103]
F-Test Auto	0.7018 [0.483]

Notes
In parentheses are absolute t-statistics values
In square brackets are p-values

The regression results presented above show that the misspecifications tests, discussed above, are all satisfied. The Wald statistic for the joint significance of regressors (DPS_{t-1}, EPS) is significant at the 1 per cent level. The time effects are significant at the 10 per cent level. Thus the results show that although the estimation is short, increasing the sample size alter some of the conclusions reached earlier. The Sargan test is insignificantly different from zero and thus leading us to accept the null hypothesis that the variables used as instruments in the GMM estimation are appropriate. As expected the F test for first order autocorrelation in residuals provide evidence of negative first order serial correlation. However, the F test for second order autocorrelation is positive and insignificant at any conventional level of significance.

The regression results show that current earnings and past levels of dividends, individually, have a significant effect on corporate dividend behaviour as proposed by Lintner. However, the constant is negative and insignificantly different from zero.

Thus the estimation results support the simulation results of Fama and Babiak (1968). It should be noted that these results do not contradict Lintner's hypothesis concerning the constant. Lintner argued that the constant may be significant for some firms, but not all. Therefore in the Zimbabwean context, firms are not reluctant to cut dividends. Both the adjustment factor and the long run payout ratio may be calculated from the above results. The resulting estimates of 0.492 and 0.36 for adjustment factor and payout ratio respectively, differ from the previous findings using a sample of 32 firms.

6.3.3 The Determinants of Dividend payout ratio

In this section we investigate the major determinants of the payout ratio. The determinants of dividend policy that we employ in this study are mainly drawn from the previous empirical literature. Although both the empirical and theoretical literature has suggested many determinants of dividend policy, we concentrate on 9 variables because of data availability. These variables are leverage, size, growth, profitability, investment, firm loss, insider, institutional and largest ownership and we briefly discuss the rationale of each variable.

Leverage

Kalay (1982) suggests that debt service and covenants, to some extent, can limit dividend payouts. The agency theory (Jensen, 1986) also suggests that leverage is a substitute for dividend payout in reducing agency costs. Thus, leverage is expected to exert a negative effect on the payout ratio. However, on the contrary, Easterbrook (1984) theorise a positive relationship. The empirical study by Dutta (1999) supports a positive relationship, while Jensen et al (1992) report a negative relationship. Dalton and Pointon (1995), however, find no significant relationship. We employ the debt-equity ratio as a proxy for leverage and we let the empirical results determine the relationship.

Size

Chang and Rhee (1990) argue that large and mature firms can afford to pay higher dividends than their smaller counterparts because they can easily access capital markets when the need arises. In this case, we expect a positive relationship between

firm size and dividend payout ratio. We employ the natural logarithm of sales as a proxy for firm size.

Growth

A fast growing firm needs to retain a higher proportion of its earnings than a mature one. Therefore, we expect such firms to have low payouts in order to avoid transaction costs associated with raising external finance (Chang and Rhee, 1990). Market-to-book ratio and earnings per share are the proxies for growth opportunities.

Profitability

Profitable firms are expected to have higher pay out ratios than firms with marginal profits. Therefore, profitability is expected to exert a positive impact on dividend payout. The proxy for profitability is the return on capital employed.

Investment

Cash dividends and expenditure on investments are the major alternative uses of corporate profits and thus investment expenditure negatively affects dividend payout levels. Capital expenditure scaled by total assets is used as a proxy for investment.

Firm Loss

Annual company loss is expected to have an adverse effect on dividend policy, since cash dividend is legally paid out of profits (current or retained) rather than capital. This implies that firms persistently reporting negative after tax earnings cannot continue to pay dividends. As we have found in section 2 above, for the period 1995-99 loss making firms have either cut or omitted dividends. We therefore expect loss-making firms to pay low dividends or omit paying. We use a dummy variable Firm Loss equal to 1 if a firm reports negative after tax earnings and 0 otherwise

Agency factors

Jensen and Meckling (1976) hypothesise that the higher the percentage of shares held by managers the lower the agency costs. Firms with closely held shares are also expected to have lower agency problems than firms with less concentrated ownership. Therefore, we hypothesise that firms with high managerial ownership, institutional

ownership and ownership concentration have lower agency costs. In addition, the asymmetric information models of dividend behaviour suggest that higher dividends signal higher firm value. Therefore firms with high insider holdings, which is a signal of higher firm value, are expected to have low payout ratios. In this study the proxies for agency costs variables are percentage of shares held by insiders (managers and directors), largest shareholder and financial institution. These three variables are expected to have a negative effect on dividend payout ratio.

6.3.3.1 The Model

The model identifies nine possible factors influencing the dividend behaviour of firms and the empirical model to determine these factors is written as follows.

$$Div_{it} = \beta_0 + \beta_1 Debt_{it} + \beta_2 Size_{it} + \beta_3 Growth_{it} + \beta_4 Profit_{it} + \beta_5 Inv_{it}$$

$$+ \beta_6 Insider_{it} + \beta_7 Inst_{it} + \beta_8 Largest_{it} + \eta_i + \lambda_t + \upsilon_{it} \qquad 6.2$$

where Div_{it} is the dividend payout ratio of the firm i at time t,

$Debt_{it}$ is the debt-equity ratio of firm i in year t

$Size_{it}$ is the size of firm i in year t

$Growth_{it}$ represents growth opportunities of firm i in year t

$Profit_{it}$ profitability of firm i in year t

Inv_{it} is the investment expenditure of firm i in year t

$Insider_{it}$ percentage of shares held by managers and directors of firm i in year t

$Inst_{it}$ percentage of shares held by financial institutions of firm i in year t

$Largest_{it}$ percentage of shares held by largest shareholder of firm i in year t

The definition of each of the variables and the expected signs are presented in table 6.7

Table 6.7

Definition of variables

Variable	Definition	Reference	Expected sign
Debt-Equity	(Total borrowing)/(shareholders funds)		
Size	Ln (sales)	Smith and Watts (1992)	Positive
MKTBKAS	[Book assets – total common equity + Shares outstanding * share price]/ book assets	Gul (1999)	Negative
Profitability	(Net Profit)/(Capital employed)		Positive
Insider Ownership	Percentage of shares held by managers and directors	Jensen, Solberg and Zorn (1992)	Negative
Largest shareholder	Percentage of shares held by largest shareholder		Negative
Institutional ownership	Percentage of shares held by financial institutions		Negative
Investment	(Capital expenditure)/total assets		
Firm loss	Dummy variable that takes a value of 1 if firm reports negative after tax profit and zero otherwise.		

Table 6.8 below summarises the descriptive statistics for the variables used in this chapter.

Table 6.8 Summary statistics

Variable	Mean	Standard deviation	Maximum	Minimum
Dividend ratio	30.5549	18.8026	94.0800	0.0000
Debt-equity	30.7529	31.1436	179.5400	0.2300
Size	13.2169	1.0866	16.3000	9.9700
Growth	28.9954	64.6711	126.3600	-243.020
Profitability	23.7501	14.4954	75.2400	0.0000
Current ratio	1.5955	0.6079	5.0000	0.4000
Insider Ownership	6.2377	14.3049	72.9800	0.0000
Largest shareholder	43.7638	18.4128	85.0000	6.7600
Institutional ownership	28.6858	18.1881	78.0400	0.8300
Investment	12.0866	19.8677	174.9700	0.24000

6.3.3.2 Empirical Results

As discussed in chapter 3, there are several ways of estimating equation 6.2 above. However, since we have a panel of 51 firms, it is most likely that unobservable firm and time specific factors may significantly influence the dividend behaviour. It is therefore, imperative to first of all test for the significance of the firm and time effects. The results of the tests are presented in table 6.9 below. These results show that only firm specific factors are significantly different from zero. Thus the unobserved time effects do not significantly alter corporate dividend decisions.

Table 6.9 Tests of significance of firm and time effects

	Null Hypothesis	Test Statistic	Statistic Distribution	P-Value
Firm and Time effects	$\eta_i = \lambda_t = 0$ $\forall_i = 1,...51$ $\forall_t = 1,....5$	122.2	χ^2_{55}	0.00
Firm effects	$\eta_i = 0$ $\forall_i = 1,...51$	116.7	χ^2_{50}	0.00
Time Effects	$\lambda_t = 0$ $\forall_t = 1,....5$	4.946	χ^2_4	0.293

The next logical procedure is to test whether these firm effects are correlated with the other explanatory variables. If there is sufficient evidence to suggest that firm effects are uncorrelated with the other explanatory variables then the random effects estimator is more efficient than the within estimator. In the case were firm effects are found to be correlated with the explanatory variables the random effects model becomes inefficient and we have to estimate the above equation by the within estimator, which is efficient and consistent whether firm effects and other regressors are correlated or not.

Table 6.10 below shows the regression results from 5 different estimators namely OLS, between, OLS in differences, within and random effects.

Table 6.10 Regression Results: General model

Dependent Variable dividend payout ratio

Variable	OLS	Between	OLS-Diff	Within (fixed effects)	Random effects
Constant	35.5249	18.3180	-4.9017	-	52.0654
	(2.2215)	(0.8271)	(1.81)		(2.7038)
Debt-equity	-0.1084	-0.1362	-0.1269	-0.1267	-0.1021
	(2.8001)	(2.1420)	(1.97)	(2.1855)	(2.4563)
Size	-0.5833	0.4927	9.7152	-5.7188	-1.5868
	(0.4963)	(0.2956)	(1.38)	(2.2492)	(1.1239)
Growth	-0.0595	-0.0646	-0.0326	-0.0363	-0.0532
	(3.2238)	(1.9067)	(1.40)	(1.5744)	(2.7878)
Profitability	-0.1115	0.0669	-0.3122	-0.2148	-0.1790
	(1.3603)	(0.5017)	(2.20)	(1.6565)	(1.9902)
Insider Ownership	0.0952	0.1970	-0.2045	-0.5677	0.0022
	(1.0629)	(1.5891)	(0.716)	(2.2361)	(0.0203)
Largest shareholder	0.1025	0.1406	-0.1850	-0.0823	0.0700
	(1.4729)	(1.5063)	(0.843)	(0.4647)	(0.8153)
Institutional	0.1815	0.1712	0.1479	0.1313	0.1609
ownership	(2.487)	(1.8766)	(0.339)	(0.4021)	(1.7592)
Investment	-0.1147	-0.2804	0.0213	-0.0265	-0.0788
	(1.9231)	(2.4806)	(0.295)	(0.3768)	(1.3138)
Specification Tests					
Adjusted R-squared	0.11	0.30		0.29	0.09
LM het. Test	0.9811[0.322]	0.5341[0.465]		0.9360[0.333]	0.1241[0.725]
Durbin-Watson statistic	1.17			1.82	1.12
F-test 1				2.2477[0.000]	
Hauseman test χ_8^2					22.676[0.007]

Notes
In parentheses are absolute t-statistics values
In square brackets are p-values

The computed F test, directly below the results from the within estimator, is a test for a common constant term for the panel of firms. In this case the null hypothesis is that the constant term does not differ significantly across the firms against the alternative that each firm has a different constant term. Thus heterogeneity of firms is captured

by estimating a dividend equation that assumes different constant terms for each firm but assuming a common vector of slope parameters. Since the reported F statistic is significant at the 1 per cent level, this provides further support that we should choose the within estimator rather than the OLS, because the OLS assumes a common intercept and slope vector for all firms. The computed Hausman test statistic is 22.676 with a p-value of 0.007 and thus suggests that the explanatory variables are correlated with the unobservable firm effects. In this case the random effects estimator is inconsistent and we therefore base our discussion of the determinants of payout ratio on results from the within estimator.

The regression results based on the within estimator show that largest, institution and investment variables have no significant influence on dividend policy decisions. Therefore in order to increase the significance of other variables, the variables largest, institution and investment were dropped from the equation one by one and an F test statistic for the joint significance of these variables was computed. The computed F statistic is insignificant and thus shows that these variables jointly do not have explanation power. Therefore, equation 6.2 was re-estimated without these variables, the results of which are presented in table 6.11

The first part of table 6.11 (Panel A) shows the influence of leverage, size, growth, profitability and insider on dividend payout ratio while the second part (panel B) includes an additional variable, *firm loss dummy.* The idea is to assess the importance of firm loss on payment of cash dividends. The diagnostics favour the choice of the within estimator since the Hausman test is significant at the 5 percent level for the results presented in both panels. For the model without the loss dummy variable leverage, size, profitability and insider ownership are statistically significant at the 10 percent or lower level of significance. Adding the loss variable, however, significantly improves the adjusted R^2 but adversely affects the significance of the debt ratio.

Table 6.11 Regression Results: Specific model

Dependent variable: Dividend payout ratio

Variable	Coefficient	T-statistic
Panel A		
Debt-equity	-0.1341	2.0846
Size	-6.0519	2.3885
Growth	-0.0352	1.9125
Profitability	-0.2091	1.2687
Insider Ownership	-0.5830	1.8387
X^2 (3) exclusion	0.6194[0.9609]	
Adjusted R-squared	0.31	
LM het. Test statistic	1.12[0.290]	
Durbin-Watson statistic	1.82	
F-test [50,188]	2.5966[0.00]	
Hausman test X^2 (5)	12.576[0.0135]	
Panel B		
Debt-equity	-0.0548	0.7665
Size	-4.8940	2.1742
Growth	-0.0328	1.9147
Profitability	-0.3267	2.1402
Insider Ownership	-0.6268	2.0399
Loss dummy	-26.2307	3.3323
Adjusted R-squared	0.39	
LM het. Test statistic		
Durbin-Watson statistic	1.9594	
F-test [50,187]	2.7673[0.000]	
Hausman test χ_6^2	10.538[0.0613]	

We now turn to a discussion of the regression results.

Leverage

The results from the regression (Panel A) indicate that firm leverage negatively and significantly affects dividend payout ratio. Thus, supporting Kalay's (1982) proposition that debt service and loan covenant adversely affect a firm's payout ratio. These results are also in line with the argument that dividend payments and firm borrowings are alternative forms of corporate control. However, the negative relationship between debt-equity ratio and dividend payout ratio does not support Easterbrook's (1984) view. The regression results reported in Panel B, however suggests that leverage has no significant impact on dividend payout once we control for firm loss.

Size

The coefficient of firm size is negative and statistically significant, indicating that larger firms have lower payouts than their smaller counterparts. This relationship is contrary to the hypothesis of Chang and Rhee (1990) and the empirical work by Holder et al (1998) and Adedeji (1998), among others. This result, however, supports the empirical work by Ang et al (1997) who suggest that the variable is a proxy for growth opportunities. There are two possible explanations for the Zimbabwean case. First, small firms signal their firm value by paying higher dividends. Second, capital markets imperfections, in terms of transaction costs and information asymmetry, are so severe such that even large firms find it difficult to raise external finance. Therefore they resort to internal financing which contributes 25% of total sources of finance, while the stock markets contributes 8%. If we take the view that holding firms are larger than non-holding firms, then the results are consistent with earlier findings that holding firms have higher capital expenditures but lower payout ratios than non-holding firms.

Growth

The market-to book variable representing the growth opportunities of a firm is statistically significant and has the hypothesised sign. This indicates that firms with high growth opportunities have lower payout ratios. These firms tend to have high retentions in order to avoid high transaction costs when sourcing external finance.

This relationship supports both theoretical work and empirical studies by Chang and Rhee (1990) and Hansen et al (1994), among others. However, Smith and Watts (1992) report a positive relationship between growth opportunities and payout ratio while Gaver and Gaver (1993), Gul (1999) and D'Sounza (1999) do not find a significant influence of growth opportunities on payout ratio.

Profitability

The coefficient of profitability, in *Panel A* results, is negative and statistically insignificant. However, the results reported in Panel B show that the coefficient of profitability is negative and significant at 5 percent level. This indicates that profitable firms have low dividend payout ratios, a result contrary to the theoretical prediction and the empirical findings by Chang and Rhee (1990) for US firms. However, Gul (1999) finds a significant negative relationship between profitability and payout for Japanese firms.

Insider ownership

Insider ownership is found to be negative and statistically significant. This result supports the view that managerial ownership aligns the interests of managers and shareholders and thus reducing the agency costs. The results also support the hypothesis that firms with higher insider ownership do not signal firm value by paying higher dividends. In other words insider ownership is a substitute for higher payout ratios in signalling firm value, a result that is consistent with the theoretical work of Ross (1977) and Jensen (1986) and the empirical findings by Hansen et al (1994), Holder et al (1998) and Saxen (1999), among others.

Firm Loss

As expected we find statistical evidence to support the view that company annual loss adversely affects the level of dividend payment. Thus the results could also mean that loss –making firms omit or cut dividends. These results are consistent with the findings of DeAngelo et al (1992) that loss is a necessary condition for omitting dividends. In the Zimbabwean case, the econometrics results are consistent with the results reported in the section on historical patterns of dividends, which shows that the aggregate dividend payout has been very low during periods of drought when most firms make losses.

6.3.4 Pay or not Pay Decision

The Model

In this section we empirically examine one of the most crucial choices that every firm should make; the choice between paying dividend (PD) and not paying dividend (NPD). The choice between these two alternative decisions (paying and not paying) can be modelled by considering utility functions. The starting point is to represent the total utility (U_{iD}) associated to paying dividend for firm i as

$$U_{iD} = \sum_{k} x_{iPDk} \beta_{k}^{p} + \upsilon_{iPD} \qquad 6.3$$

where β_{k}^{PD} are parameters to be estimated and x_{iPDk} are the characteristics of firm i that are most likely to have a significant impact on the decision to pay dividends.

We can assume that the dependent variable takes the value of one if firm i decides to pay dividends and a value of zero otherwise. More formerly

$$y_i = \begin{cases} 1 \text{ if firm i pays dividend} \\ 0 \text{ if firm i omits paying dividend} \end{cases}$$

In this case the probability of paying dividends is assigned the logistic form

$$P_{iPD} = P_r(y_i = 1) = \frac{\exp\left(\sum_{k} x_{iPDk} \beta_{k}^{PD}\right)}{1 + \exp\left(\sum_{k} x_{iPDk} \beta_{k}^{PD}\right)} \qquad 6.4$$

The maximum likelihood estimation procedure can be used to estimate the parameters of equation 6.4

In this section, we consider 7 firm characteristics as potential determinants of the decision to pay. These are leverage, firm loss dummy, growth, lagged payout, size, cash flow and profit. Following Cramer (2001), we first assess the effect of

introducing each of the explanatory variables on the estimated slope coefficients and log likelihood.

Empirical results

The results reported in table 6.12 show the effect of introducing each of the explanatory variables on the estimated slope coefficients and log likelihood and it can be seen that leverage on its own has no significant influence on the decision to pay dividends. However, all other variables have a significant influence on the decision to pay.

Table 6.12: Effect of adding regressor variables on log likelihood of binary dividend decision model

Log L	Constant	Debt	Loss	Growth	Dividend $_{t-1}$	Size	Cash	Profit	X^2
-78.43									
-78.21	-0.209	0.001							0.445
	(7.727)	(0.689)							[0.504]
-69.91	-0.208	-0.001	0.251						17.05
	(7.424)	(0.894)	(4.102)						[0.00]
-61.91	-0.323	-0.001	0.222	0.002					33.04
	(5.661)	(1.275)	(3.513)	(3.104)					[0.00]
-53.35	-0.144	-0.002	0.286	0.002	-0.0053				50.17
	(2.136)	(2.039)	(3.541)	(2.505)	(3.726)				[0.00]
-52.85	0.116	-0.002	0.269	0.002	-0.005	-0.021			51.16
	(0.436)	(1.788)	(3.290)	(2.639)	(3.747)	(0.998)			[0.00]
-50.52	0.312	-0.002	0.226	0.002	-0.006	-0.028	-0.009		55.831
	(1.025)	(2.197)	(2.640)	(2.370)	(3.949)	(1.197)	(1.88)		[0.00]
-48.26	0.471	-0.003	0.264	0.003	-0.006	-0.047	-0.013	0.004	60.35
	(1.491)	(2.454)	(2.999)	(2.687)	(3.961)	(1.875)	(2.418)	(2.116)	[0.00]

Derivatives of probabilities at sample frequencies (mean)

Notes
In parentheses are absolute t-statistics values
In square brackets are p-values

The logit regression results are reported in table 6.13 and we now turn to a discussion of these results.

The coefficient of the debt ratio has a positive sign and is statistically significant at the 5 % level, indicating that borrowing increases the probability that the firm pays dividends. This finding is in line with the observation that some loss firms with high capital expenditures have been paying dividends. The loss dummy variable has the expected significantly negative sign. This means that firms reporting an annual loss are less likely to pay dividends. This is consistent with the findings of DeAngelo et al (1992) and Charitou (2000) for US and Japanese firms. This finding, however, contradicts the proposition that dividends are sticky. A significantly negative coefficient is found on the growth opportunity variable. In other words firms with high growth opportunities have lower payout ratios and are most likely to omit dividends. Thus the results confirm the pecking order and transaction cost view that firms resort to internal finance in order to avoid the costs of external finance. Our results are also in line with the results reported by Fama and French (2001) for US firms.

Table 6.13 Regression results from binary model: yi=0 not pay, yi=1 pay

Variable	Coefficient	t-value
Constant	-5.3148	1.49
Debt	0.0287	2.45
Loss	-2.9751	3.00
Growth	-0.0302	2.69
Dividend t-1	0.0700	3.96
Size	0.5344	1.88
Cash	0.1422	2.42
Profit	-0.045	2.12

As expected, the coefficient of past dividend level has a positive sign and is highly significant. This shows that a firm that pays dividend in the previous year is also most likely to pay dividend in the current year. The estimate for firm size has the expected sign and is statistically significant and thus suggesting that the variable, *size,* increases

the probability that larger firms are most likely to pay dividends. Cash flow has the expected positive sign and is statistically significant at the 5 % level, indicating that the existence of free cash flow makes it most likely that the firm pays dividend. The coefficient of the profitability variable is negative and statistically significant at the 5 % level. This suggests that profitable firms are less likely to pay dividends, a result contrary to expectations.

6.3.4 Decision to increase, maintain and reduce dividends

In this section, we extend the model of the previous section to model the 3 important dividend choices that each firm faces; namely the decision to increase, maintain or reduce dividends. The estimation issue that we have to consider is whether these decisions are ordered or not. In this study we assume that the three decisions are unordered and therefore can be represented by a multinomial logit model. The multinomial model is derived from the utility functions (Cramer, 2001). First, we assume that firm i (=1, 2 , 3.....51) can make any of J possible decisions at time t. In this study J=3: decision to increase (j=0), maintain (j=1) and reduce (j = 2) dividend per share. The 'utility' of taking decision j (j = 0, 1, 2) in time period t>0 is, therefore, specified as

$$U(i,j,t) = x'_{it}\beta_j + \upsilon_{it} \qquad 6.5,$$

Where x'_{it} is a vector of explanatory variables suggested in the finance literature. Normalising the parameters of the first state to zero, then the probability that firm i selects alternative j at time t>0 given characteristics x'_{it} is described by the following multinomial logit model;

$$P_{Decision=j} = \frac{\exp\left(x'_{it}\beta_j + \upsilon_{it}\right)}{\sum_{j=0}^{3}\exp\left(x'_{it}\beta_j + \upsilon_{it}\right)} \qquad 6.6$$

The explanatory variables that enter the above equation are leverage, growth, $dividend_{t-1}$, size, profitability, cash flow and investment. We hypothesise that not all of these factors are significant determinants of each of the three decisions. The idea is to include as many potential determinants as possible and then exclude some of the variables that are not statistically significant. The definitions of these variables and the expected signs have been presented in section 4.2 above.

The results reported in table 6.14 show the effect of adding regressor variables on the log likelihood of the multinomial dividend decisions.

Table 6.14 Effect of adding regressor variables on log likelihood of multinomial dividend decision model

Regressions	Log L	χ_1^2	χ_2^2
Constant only	-225.6232	-	-
Constant, debt	-217.0975	17.051	17.051
		[0.000]	[0.000]
Constant, debt, growth	-214.9179	21.411	4.359
		[0.000]	[0.1131]
Constant, debt, growth, size	-210.6872	29.872	8.4614
		[0.000]	[0.0145]
Constant, debt, growth, size, $dividend_{t-1}$	-201.2486	48.749	18.8772
		[0.000]	[0.000]
Constant, debt, growth, size, $dividend_{t-1}$, profit	-194.0347	63.177	14.4278
		[0.000]	[0.0007]
Constant, debt, growth, size, $dividend_{t-1}$, profit, cash flow	-188.0434	75.16	11.9826
		[0.000]	[0.0025]
Constant, debt, growth, size, $dividend_{t-1}$, profit, cash flow, investment	-183.6986	83.849	8.6896
		[0.000]	[0.0130]

p-values in square brackets

The first χ^2 value (χ_1^2) reported in table 6.14 (column 3) are defined as $2(L_j - L_0)$ where L_0 is the value of log likelihood function when the only explanatory variable is the constant term and L_j is the value of the log likelihood function when j $(j \leq 7)$ explanatory variables are included. The degrees of freedom equal the number

of slope coefficients estimated. The second χ^2 values (χ_2^2)reported in table 3 (column 4) are defined as $2(L_{j+1} - L_j)$ and thus measure the joint impact of each additional explanatory variable on the decision to change dividends (increase, maintain and reduce). In the following discussion, we shall refer to this statistic as the chi-square statistic. In addition, we verify the impact of each variable on the probability that firm i will choose alternative j, by computing marginal effects as

$$\frac{\partial \text{Prob}(y_{\text{Decision}} = j)}{\partial x_j} = \text{Prob}(y_{\text{Decision}=j})\left[\beta_j - \sum_t \text{Prob}(y_{\text{Decision}=j})\beta_j\right] \qquad 6.7$$

Table 6.15 Multinomial model qausi-elasticities

Variable	Increase	Maintain	Reduce
Constant	-0.9031	0.5449	0.3581
	(1.8237)	(1.6528)	(0.8500)
Debt	-0.1106	0.0214	0.0892
	(2.6410)	(0.8671)	(2.6170)
Growth	-0.0168	0.0158	0.0009
	(0.8832)	(1.0396)	(0.0569)
Dividend t-1	-0.0472	0.1218	0.1690
	(0.7190)	(2.5496)	(2.9929)
Size	1.041	0.5908	0.45015
	(2.1683)	(1.7536)	(1.0988)
Cash	0.2072	-0.0657	0.1415
	(3.0105)	(1.3562)	(2.1742)
Profit	0.1748	-0.1239	0.1624
	(2.5717)	(0.2589)	(2.6136)
Investment	-0.0135	0.0343	-0.0208
	(0.4022)	(2.5061)	(0.6154)

Notes
In parentheses are absolute t-statistics values

We now turn to the interpretation of results.

Leverage

The results presented in table 6.14 show that the chi-square statistic of 17.051 is well beyond the critical value at the 1 % level, indicating the significant joint impact of

leverage on the decision to change dividends. However, the results shown in table 6.15(marginal effects) indicate that the marginal effect of leverage is statistically significant for two decisions; *increase* and *reduce*. This is in line with the results from the multinomial logit (table 6.16) which indicate that the coefficient on leverage is significant for the decision to maintain payment of dividends. The negative sign of leverage (-0.0177 for decision to reduce) indicates that as the firm's leverage ratio increases firms are most likely to reduce dividends rather than increase. This finding is consistent with the theoretical predictions of Kalay (1982) and Jensen (1986).

Table 6.16 Estimated coefficients of full multinomial dividend decision model

State	Constant	Debt	Growth	Size	$Dividend_{t-1}$	Profit	Cash Flow	Investment
Reference state REDUCE								
Increase	-2.9353	-0.018	-0.001	0.2675	-0.0240	0.0398	0.0929	0.0052
	(1.23)	(2.74)	(0.346)	(1.54)	(2.43)	(2.76)	(2.57)	(0.330)
Maintain	2.3425	-0.007	0.0037	-0.173	-0.0482	0.0242	0.0119	0.0268
	(0.765)	(0.962)	(0.755)	(0.733)	(3.47)	(1.23)	(0.242)	(1.77)
Reference state MAINTAIN								
Increase	-5.2778	-0.011	-0.005	0.4406	0.0242	0.0157	0.0810	-0.0216
	(1.87)	(1.51)	(1.09)	(2.04)	(1.92)	(0.936)	(2.00)	(2.20)

Notes
In parentheses are absolute t-statistics values

Growth

The chi-square statistic shows that, at the 5 per cent level, firm growth has no impact on the firms' decision to change dividends. The marginal effects reported in table 6.15 as well as the estimation results in table 6.16 also indicate that the growth variable has no significant effect on the three decisions.

Size

The variable size appears to be important in explaining dividend decisions, as shown by the significant chi-square statistic of 8.46. Although the joint impact of size is significant at the 5 per cent level, the marginal effects show that the size variable has a significant impact on the decision to increase and maintain dividends. With reference to the decision to reduce dividends, the estimated coefficients on the size variable, for the decisions to increase and maintain dividends, are insignificantly different from zero. However, firm size increases the probability of increasing dividends relative to the probability of maintaining dividend payment.

$Dividend_{t-1}$

The variable *$Dividend_{t-1}$*, which measures the payout ratio in the previous period, has a significant chi-square for the joint effects (18.88). The marginal effects show that past payout ratio has a significant impact on the decisions to maintain and reduce dividends. The results from the estimated multinomial logit show that all individual coefficients for *$Dividend_{t-1}$* are significantly different from zero at the 10 per cent level or lower. With reference to the decision to reduce dividends, the sign of the coefficient is negative for the decisions to increase (-0.024) and maintain (-0.0482). The negative sign for the decision to increase and maintain indicates that the firm with high past levels of dividends is less likely to increase or maintain in preference to reducing dividends. However, the results reported in table 6.16b show that, with reference to the decision to maintain dividends, *$Dividend_{t-1}$*, has a positive sign, which is significant at the 10 per cent level. This indicates that high past levels of dividends makes it most likely that the firm will increase dividends rather than maintain them.

Profitability

The variable profitability has a significant joint impact on dividend decisions. This significant effect of profitability is reported on the decision to increase and reduce dividends. Thus the estimated coefficients of profitability show that profitable firms are most likely to increase rather than reduce dividends. Profitability, however, does not discriminate between increasing and maintaining decisions.

Cash Flow

The chi-square statistic, for the cash flow variable, is significant and thus suggesting that cash flow is important for the decision to change dividends. However, the marginal effects show that cash flow has greater explanatory power for the decisions to increase and reduce dividends. With reference to the decision to reduce dividends, cash flow increases the probability that firms will increase dividend payments. However, cash flow does not discriminate between the decision to reduce and maintain, but makes it most likely that firms will increase dividends in preference to maintaining them.

Investment

The last variable, investment, also has a significant joint effect on the dividend decision. Despite the significant joint effect, however, the results shown in table 6.15 indicate that only the marginal effects of the decision to maintain are significant. The results shown in table 6.16a suggest that higher capital expenditure increases the probability that the firm will maintain rather than reduce dividends. However, the results reported in table 6.16b indicate that capital expenditure makes it less likely that the firm will increase payment of dividends relative to maintaining them.

6.4 Summary and Conclusion

In this chapter we have aimed to achieve two goals: First, to document the pattern and evolution of the dividend policy of the Zimbabwean corporate sector over the past 25 years. Second, to provide econometric evidence on the major determinants of dividend changes over the past 5 years. We have found that net income and losses have a significant impact on dividend changes. The percentage of firms issuing new equity and paying dividends in the same accounting year has substantially increased after financial reform. A possible explanation is that the reform programme has altered the institutional environment. For example easy access to capital markets for firms and the reduction of capital gains tax from 30 % to 10 % for all shares, which are traded on the stock market. Although, the aggregate payout ratios during UDI

independence and Reform were respectively 56, 36 and 38, the data, however, does not reject the hypothesis that these respective payout ratios are statistically the same.

During the period 1995-99, all firms that have reported at least one annual loss have either reduced or omitted paying dividends. In particular, about 80 % of all firms, which reported at least one annual loss, have omitted paying dividends. However, 67 % of the firms in the sample never omitted paying dividends. The descriptive statistics results also suggest that the payout ratio significantly vary across industries and in this case, the highest payout ratio is reported for the multinational companies (46) and the lowest (26) is in the agricultural input sector.

The above observations, from descriptive statistics, give us an indication that annual loss, net income and the financial reform program have a significant impact on firms' decisions to change dividend policy and therefore, in the second section of the chapter we econometrically investigated the major determinants of dividend policy.

Using the recent developments in panel data estimation (dynamic model) we empirically estimated the dividend stability model first proposed by Lintner (1956). The results are consistent with Lintner's prediction that past levels of dividends and current earnings are the major determinants of corporate dividend behaviour. The results also support the conclusion of Fama and Babiak (1968) that the constant is zero in the Lintner model. Thus the Lintner model describes very well corporate dividend behaviour in emerging markets.

The econometric evidence based on the within estimates suggests that the payout ratio is negatively related to debt ratio, firm size, growth, profitability, firm loss and managerial stock ownership. However, although block shareholders, institutional ownership and investment have been suggested as potential determinants of payout ratio, in the previous studies, our regression results suggest that these variables do not significantly influence dividend policies of the Zimbabwean corporate sector.

Logit regression results suggest that debt ratio, past levels of dividend, cash flow and institutional investors on one hand increase the likelihood that the firm will pay

dividend. On the other hand profit loss and growth opportunities negatively affect the decision to pay.

The results from the multinomial logit suggest that profitability and cash flow increase the probability of increasing dividends relative to the probability of reducing dividend payment. In addition, investment increases. On the other hand leverage and past dividends reduce the probability that a firm will increase dividends in preference to reducing them. The results also show that past levels of dividends and investment have a significant impact on the choice of reducing and maintaining dividends. The lagged dividend variable reduces the probability of choosing alternative '*maintain*' relative to alternative '*reduce*', while investment increases the probability that the given firm will maintain dividends in preference to reducing them. The major determinants of the decision to increase or maintain dividends are past levels of dividends, size, cash flow and investment. Size, past levels of dividends, and cash flow make it most likely that a given firm will increase dividends rather than maintain them, but investment makes it less likely that the firm will increase dividends.

Chapter 7

The Interaction Between Financing and Dividend Policy Decisions.

7.1 Introduction

Although Modigliani and Miller (1958) and Miller and Modigliani (1961) have demonstrated respectively that, under certain assumptions, investment decisions are independent of financing and dividend policy decisions, the recent finance literature tends to suggest that there is some degree of interdependence among financial policy decisions (see, for example, Jensen et al, 1992 and Noronha *et al*, 1996). The empirical implication of interdependence among financial policies is that estimation of the individual equations without taking into consideration the information provided by other equations in the system is likely to yield biased and inconsistent parameter estimates. Therefore, a few studies have empirically examined the determinants of financial policies in a system of simultaneous equation framework and the results suggest that financial policies are indeed interdependent.[19] However, most of the recent empirical studies are based on US and other developed countries data.

The main objective of this chapter is to examine the extent to which financing and dividend policy decisions are interrelated in emerging markets. By using firm level data from companies listed on the Zimbabwe stock exchange, this paper seeks answers to the following question; Are financial policies interdependent and if they are what are the key determinants of dividend and financing decisions in a simultaneous equation framework?

The focus of the present study is on the interrelationship between capital structure and dividend policy decisions. The study employs the fixed effects three stage least squares estimator but differs from Haan (1997) in three respects. First, our study is based on data from an emerging market with institutional characteristics that are different from those of developed countries. Second, consistent with Jensen *et al*

[19] See Haan (1997), for a recent review of the literature.

(1992) and Noronha *et al*, (1996), we employ a stock measure of debt. Third, consistent with Noronha *et al*, (1996), we estimate a two equation simultaneous model.

7.2 Model specification, data and estimation

In this section we specify the capital structure and dividend equations. Using panel data on firms listed on the Zimbabwe stock exchange, the capital structure equation is specified as follows:

$$y_{it} = x'_{it}\beta + \eta_i + \upsilon_{it} \qquad (7.1)$$

$$i = 1,2,.....,51,\ t = 1995, ..., 1999$$

where y_{it} is the debt-equity ratio, x'_{it} contains variables which have been suggested in the literature to have an influence on the financing decision of firms. The η_i are the unobservable firm effects that may be correlated with x'_{it}, and υ_{it} is the disturbance term assumed to have a mean zero and a constant variance.

Similarly, the dividend equation is specified as

$$w_{it} = z'_{it}\beta + \eta_i + \upsilon_{it} \qquad (7.2)$$

$$i = 1,2,.....,51,\ t = 1995, ..., 1999$$

where w_{it} is the debt-equity ratio, z'_{it} contains variables which have been suggested in the literature to have an influence on dividend payout of firms. The η_i are the unobservable firm effects that may be correlated with z'_{it}, and υ_{it} is the disturbance term assumed to have a mean zero and a constant variance.

The data is obtained from financial statements (balance sheets, Profit and Loss account and cash flow statements) of non-financial firms listed before 1998. All

companies that have been de-listed or with incomplete data set were excluded resulting in a sample of 51 companies. The possible simultaneity problem and correlation of firm effects with the explanatory variables are two econometrics issues that need to be addressed when estimating equations (7.1) and (7.2) above. As mentioned above, the previous studies have mainly addressed the simultaneity problem[20]. However, if the unobserved firm effects are correlated with explanatory variables OLS and simultaneous equation estimators like 2SLS, 3SLS and FIML will produce estimates that are biased and inconsistent. The firm specific effects can, however, be eliminated by expressing each equation in deviation from the individual mean form as follows:

$$(y_{it} - \dot{y}_{t.}) = \beta(x_{it} - \dot{x}_{t.}) + (\upsilon_{it} - \dot{\upsilon}_{t.}) \qquad (7.3)$$

$$(w_{it} - \dot{w}_{t.}) = \beta(z_{it} - \dot{z}_{t.}) + (\upsilon_{it} - \dot{\upsilon}_{t.}) \qquad (7.4)$$

The simultaneity problem can then be accounted for by applying simultaneous equation estimators like 2SLS or 3SLS to (7.3) and (7.4). In this paper we use the within 3SLS estimators to estimate the above two simultaneous equation system.

The endogenous variables in this two simultaneous equation system are debt-equity ratio and dividend payout ratio, while the exogenous variables are, profitability, growth opportunities, tangibility, tax, insider ownership, loss dummy, institutional ownership and blockholder. In order for the equations to be identified we exclude the growth and institutional ownership in the debt equation. We also exclude blockholder variable from the debt equation. The definitions and the expected signs of the variables are given in table 7.2. We briefly discuss the rationale of each variable.

[20] Haan(1997) is an exception.

Table 7.1a Definition of variables

Dependent Variable	Definition	Expected sign
Debt-Equity	(Total borrowing)/(shareholders funds)	
Independent variables		
Dividend payout	Dividends/distributable earnings	Negative
Profitability	(Net Profit)/(Total assets)	Positive
Tangibility	Fixed assets/ Total assets	Positive
Insider Ownership	Percentage of shares held by managers and directors	Negative
Tax	Taxation/Income before tax and interest	Positive
Blockholder (Largest shareholder)	Percentage of shares held by largest shareholder	Negative

Table 7.1b Definition of variables

Dependent Variable	Definition	Expected sign
Dividend payout	Dividends/distributable earnings	
Independent variables		
Debt-Equity	(Total borrowing)/(shareholders funds)	Negative
Growth Opportunities	[Book assets – total common equity + Shares outstanding * share price]/ book assets	Negative
Profitability	(Net Profit)/(Total assets)	Positive
Insider Ownership	Percentage of shares held by managers and directors	Negative
Institutional ownership	Percentage of shares held by financial institutions	Negative
Dloss	1 if loss and 0 otherwise	Negative

7.2.1The determinants of financing policy

Corporate tax rate

Modogliani and Miller (1963) have shown that interest tax deductions reduce the corporate tax bill. For this reason, the corporate tax rate is positively related to debt ratio. The empirical results are however, inconclusive. Homaifar *et al* (1994) find supportive evidence of Modigliani and Miller (1963) proposition that the corporate tax has a positive impact on debt usage. On the other hand, the findings of Krisma and Moyer (1996) Lowe et al (1998) and Booth, et al (2001) suggest that the corporate tax rate has an adverse effect on debt usage. In this study, the ratio of tax paid to

operating income is used as a proxy for the effective tax rate and we expect to find a positive relationship between the tax rate and debt equity ratio.

Profitability

The trade-off hypothesis suggests that firms with high current cash flow should have easy access to credit markets (Rajan and Zingales, 1995). Therefore, profitability is hypothesised to be positively related to debt usage. However, the pecking order hypothesis proposed by Myers (1984), Myers and Majluf (1984) predicts that firms prefer internal finance as their main source of finance, followed by debt finance and then equity finance as a last resort. In this case profitability is inversely related to the debt ratio.

Titman and Wissels (1988), Jensen et al (1992), and Wiwattanakang (1999) find strong evidence that profitability adversely affect the amount of debt levels in the capital structure. In other words, profitable firms use less debt. However, this is contrary to the prediction of the optimal capital structure theory, which suggests that profitability greatly reduces the probability of bankruptcy/financial distress and thus predicting a positive relationship between leverage and profitability. Our measure for profitability is the return on total assets and we expect a negative relationship between debt equity ratio and profitability.

Tangibility

Before a loan is advanced to a firm, the lender first assesses the nature of the investment project, in particular the firm's business, risk and its expected future cash flows. The terms and conditions of a loan, together with the interest rate charged all depend on these factors. But once a loan has been advanced, managers may substitute riskier investments for less risk ones (Jensen and Meckling, 1976). This asset substitution problem is harmful to lenders if the project fails and in order for lenders to protect their interests, they ask for loan covenants and provisions. In turn, loan covenants and provisions limit managerial discretion and therefore affect company performance.

However, the asset substitution together with the loan covenants and provisions problems can be greatly reduced if assets could be used as collaterals. For this reason, firms with collateralisable (tangible) assets enjoy favourable debt terms than those with less collateralisable assets. To this end, the variable proxying asset

tangibility is positively related to firm leverage, while the proxy for intangible assets is negatively related to firm leverage. Friend and Long (1988), and Jensen *et al* (1992) report results, which are consistent with the notion that tangible assets enhance the borrowing capabilities of a firm. The proxy for tangibility is the ratio of fixed assets to total assets.

Agency factors

The agency cost models emphasise the conflicts of interests between managers, equity holders and debt holders as the major determinants of firm performance and argues that debt financing, to some extent, can mitigate this problem. However, debt policy is not the only agency-cost reducing mechanism available. Managerial and block-holder ownership have been considered to be the major substitutes for debt policy. If this is true, then there is a strong negative relationship between debt policy and managerial and institutional stock ownership.

7.2.2The determinants of dividend policy

Debt ratio

Kalay (1982) suggests that debt service and covenants, to some extent, can limit dividend payouts. The agency theory (Jensen, 1986) also suggests that leverage is a substitute for dividend payout in reducing agency costs. Thus, leverage is expected to exert a negative effect on the payout ratio. However, on the contrary, Easterbrook (1984) theorise a positive relationship. The empirical study by Dutta (1999) supports a positive relationship, while Jensen et al (1992) report a negative relationship. Dalton and Pointon (1995), however, find no significant relationship. We employ the debt-equity ratio as a proxy for leverage and we let the empirical results determine the relationship.

Firm growth

A fast growing firm needs to retain a higher proportion of its earnings than a mature one. Therefore, we expect such firms to have low payouts in order to avoid

transaction costs associated with raising external finance (Chang and Rhee, 1990). Market-to-book ratio and earnings per share are the proxies for growth opportunities.

Profitability

Profitable firms are expected to have higher pay out ratios than firms with marginal profits. Therefore, profitability is expected to exert a positive impact on dividend payout. The proxy for profitability is the return on capital employed.

Agency factors

Jensen and Meckling (1976) hypothesise that the higher the percentage of shares held by managers the lower the agency costs. Firms with closely held shares are also expected to have lower agency problems than firms with less concentrated ownership. Therefore, we hypothesise that firms with high managerial ownership, institutional ownership and ownership concentration have lower agency costs. In this study the proxies for agency costs variables are percentage of shares held by insiders (managers and directors) and financial institution. These two variables are expected to have a negative effect on dividend payout ratio.

7.3 Empirical Results

7.3.1 Interdependence between dividend and debt policies

Tables 7.2 and 7.3 present a summary of the within 3SLS estimation results for the simultaneous system of debt and dividend equations of (7.3) and (7.4) respectively. In each table we report point estimates for the equation parameters, the associated t values and standard errors. We also report the F test statistic for heteroscedasticity under the null hypothesis of homoscedasticity. The results show that F test statistic is 1.2192 with a p-value of 0.1419. Thus the null hypothesis of a constant variance cannot be rejected at any conventional critical level. We also report results from the within and within-2SLS estimators, but our discussion is based on the within-3SLS results.

Our primary interest is in the significance and signs of the regression coefficients of the endogenous variables in each of the equations. The coefficient of the payout ratio in the debt equation is negative and significant at the 1 % level. Similarly, the coefficient of the debt ratio in the dividend equation is negative and significant at the 1 % level. Therefore, the results strongly reject the Modigliani and Miller's (1958,1961) separation principle that financing and dividend decisions are independent. The results also reject the proposition that firms may borrow in order to pay higher levels of dividends. The negative interaction of debt and dividend payout confirms that firms pay dividends out of internal finance as required by the Zimbabwean company law.

The second possible explanation for the negative relationship between financing and dividend payment is based on Kalay's(1982) argument that debt service and covenants may limit the amount of cash paid out as dividends. Thus firms that are highly leveraged have an incentive to reduce their dividend levels in order to meet their debt obligations (interest and loan repayment). This is in line with the observation that very high interest rates in Zimbabwe discourage corporate borrowing. For example in December 1999, bank (commercial and discount houses) lending rates fluctuated between 65 % and 98 %, while hire purchase rates ranged from 63 % to 82 %. Therefore, the burden on debt repayment forces firms to reduce or even omit payment of dividends. This explains why firms are reluctant to borrow from banks. For example, in chapter four we reported that for the period 1990-99 bank loans contribute 1.2 % of total finance. These explanations are consistent with the prediction of the pecking order hypothesis.

The third possible explanation for the significant negative relationship is based on the agency cost hypothesis that debt financing and dividend payments are alternative mechanisms for controlling the management and shareholder conflict. We can, therefore conclude that in Zimbabwe, financing and dividend payment decisions are interrelated and should be determined in a simultaneous equation framework. This finding is consistent with previous studies based on data from developed countries

7.3.2 Impact of firm-specific factors

In this section, we discuss the impact of firm characteristics on financing and dividend decisions. Comparable results are found in studies that have used either single equation estimators, neglecting simultaneity bias or system estimators but neglecting fixed effects bias. We discuss the results equation by equation and compare with results from previous studies.

7.3.2.1 Debt equation

The within 3SLS estimation results presented in table 7.3 show that the coefficient of profitability is negative and significantly correlated with debt ratio. This finding supports the pecking order hypothesis but contradicts the prediction of the trade-off hypothesis that firms with high current cash flows are most likely to have easy access to credit markets. These results are also in line with the conclusions of Singh and Hammid (1992) and Singh (1995) that firms operating in developing countries rely heavily on internal financing.

Table 7.2 Regression results; (51 firms 1995-1999) Debt equation

Variable	Within	Within 2SLS	Within 3SLS
Constant	-	-	-
Dividend	-0.1828	-0.6784	-0.7635
	(2.12)	(3.25)	(4.24)
Profitability	-0.3881	-0.5139	-0.5223
	(2.59)	(3.38)	(3.62)
Tangibility	-0.4226	-0.3191	-0.2594
	(2.60)	(1.98)	(1.99)
Tax	-0.3095	-0.1941	-0.2228
	(2.74)	(1.65)	(2.31)
Insider	-1.4515	-1.6363	-1.6497
	(4.95)	(5.63)	(5.84)
Blockholder	0.5020	0.3837	0.2693
	(2.38)	(1.85)	(1.77)
Sigma	19.2886	18.5472	19.0782
AIC		10.8937	10.8712
Hetero F		1.2983	1.2192
		0.090	0.1419
Over-identification	-	9.352 [0.0529]	9.6365 [0.1409]
Restriction $\chi^2_{(4)}$			

Notes
In parentheses are absolute t-statistics values
In square brackets are p-values

The coefficient of the asset tangibility is negative and statistically significant. This suggests that firms with more fixed assets tend to borrow less, which is, however, not consistent with the prediction of the corporate strategy theory as suggested by Williamson (1988). A possible explanation is that the variable is probably a proxy for non-debt tax shields for Zimbabwean firms rather than a measure of asset specificity. In Zimbabwe, a wide range of fixed assets qualify for a Special Initial Allowance which allows 100 % first year depreciation of fixed assets for corporate tax purposes. Companies that acquired fixed assets enjoy a substantial tax shelter, which in turn would reduce the taxable income that could be shielded by debt. Thus, purchases of fixed assets may tend to dominate the tangibility ratio and also the tax shields enjoyed by Zimbabwean firms.

The tax rate, is also significant at the 1% level, althought the coefficient has counter-theoretical signs. The negative relation between the tax rate and the debt ratio is still consistent with the findings of Krishnan & Moyer (1996), Lowe et al (1998) and Booth, et al (2001), among others. In Zimbabwe, the relationship could be attributeable to an expectational effect induced by government tax policy. The corporate tax rate was reduced every year from 1995 to 1999. Companies would therefore have had an incentive to bring forward tax shelters as much as possible to maximise their tax benefits prior to the next cut. Thus, successive tax cuts would be associated with increases in debt ratios as firms expected further tax cuts in the future.

The proxy for the influence of management on capital structure decisions enters the debt equation with a negative sign and is statistically significant at the 1 % level. This suggests that managers dislike high debt levels in capital structures of firms they control. Thus supporting the hypothesis that the presence of high debt levels in the firm's capital structure is against the interest of management since it increases the firm's financial risk (Friend and Lang, 1988). This, also, indicates that managerial ownership is a substitute of debt as suggested by Jensen and Meckling (1976).

The proxy for the influence of blockholders is found to be positive and significantly correlated with the debt ratio. This suggests that firms with high ownership concentration are highly leveraged and thus block shareholding complements debt in controlling managers.

7.3.2.2 Dividend equation

The coefficient of the market to book variable is negative and but not statistically significant at the 10 % level. However, the negative sign suggests that firms with high growth opportunities are likely to have low payout ratios. This is in line with Jensen's (1986) proposition that firms with high growth opportunities are most likely to pay low dividends since they have free cash flow problems. This is also consistent with the suggestions of Rozeff (1982) and Easterbrook (1984) that firms with high growth options tend to rely more on internal financing which is less costly than external financing.

Table 7.3 Regression results; (51 firms 1995-1999) Dividend equation

Variable	Within	Within 2SLS	Within 3SLS
Debt	-0.0788	-0.3674	-0.4317
	(1.42)	(2.16)	(2.56)
Profitability	-0.4309	-0.4449	-0.4682
	(3.92)	(4.22)	(4.47)
Growth	-0.0388	-0.0343	-0.0164
	(1.80)	(1.66)	(1.14)
Dummy	-28.4289	-18.8804	-18.0996
	(5.46)	(3.03)	(3.05)
Insider Own.	-0.6506	-1.0006	-1.0733
	(2.72)	(3.27)	(3.51)
Institutional Own.	0.3981	0.4001	0.1461
	(1.34)	(1.42)	(0.759)
Sigma	15.0268	14.2934	14.7655
AIC		10.8937	10.8712
Hetero F		1.2983	1.2191
		0.0900	0.1419
Over-identification	-	9.352	3.838
Restriction $\chi^2_{(4)}$		[0.0529]	[0.4284]

Notes
In parentheses are absolute t-statistics values
In square brackets are p-values

The coefficient of profitability is negative and statistically significant. This indicates that profitable firms have low dividend payout ratios, a result contrary to the theoretical prediction.

There is a negative and statistically significant relationship between insider ownership and dividend payments. This indicates that firms with high managerial ownership are likely to have low payouts. This is in line with the agency argument of Rozeff (1982) and previous empirical evidence by Holder et al (1998) and Jensen (1992). The percentage shareholding of financial institutions is another variable capturing the effects of agency costs on dividend payment decisions. The coefficient of this variable is positively correlated with dividend payout ratio, but insignificant at any conventional critical level.

Dloss is a variable that takes a value of 1(0) when a firm reports loss (profit). The expectation is that loss-making firms either cut or omit dividends. The regression results show that the Dloss variable is negative and statistically significant at the 1 % and thus indicating that loss-making has a negative impact on dividend payment, as expected.

7.4 Summary and Conclusions

In this chapter, we have empirically examined the extent to which financing and dividend policy decisions are interdependent. The empirical model account for endogeneity arising from the simultaneity and firm effects problems. Using company accounts data, our major conclusion from this examination is that there is strong evidence of interrelationship between financing (debt) and cash distribution (dividend) decisions. The empirical results strongly support the pecking order hypothesis. The results also suggest that firms with high percentage of insider ownership choose lower levels of both debt and dividend policies. The other result that is consistent with the theory is a negative and significant relationship between growth and dividend payout. Firms with high ownership concentration have higher payouts. However, contrary to the theory, our results show that tangibility and tax variables have a negative influence on financing decisions.

Chapter 8 Conclusion

Now all has been heard; here is the conclusion of the matter: Fear God and keep his commandments, for this is the whole duty of man.
Ecclesiastes 12: 13

8.1 Introduction

The main purpose of this study has been threefold. First, to explore firm characteristics across the regimes. Second, to explore the financing and dividend policy patterns of listed non-financial firms in Zimbabwe. Third, to investigate the major determinants of corporate financial policy in Zimbabwe. In this chapter we summarise the main findings and suggest further research in corporate financial policy.

8.2 Firm characteristics

Most of the listed firms in Zimbabwe are owned by domestic corporate bodies (44 %), followed by financial institutions, (40 %). The government, by holding 3.1 % of outstanding shares, does not play a major role in controlling listed firms. Using a data set from 32 firms over the period 1975 to 1999, we compared firm performance, payout and debt ratios across the regimes. The results showed that there was a significant increase in long term debt, new equity, internal finance and investment after the implementation of the economic reform programme. The results also showed that firm profitability during Independence period was not significantly different from the UDI and a possible explanation is that both periods were repressive regimes. However, the profitability of firms significantly improved after the implementation of the reform programme. Liquidity, on the other hand, increased significantly from UDI to Independence and from independence to the reform period. Growth and firm size also significantly increased over time.

We also disaggregated the data into holding and non-holding firms and compared the financial performance of holding and non-holding listed firms in Zimbabwe over the

period 1995 to 1999. The descriptive statistics showed that profitability, tax paid and tangibility of these firms are very close. However, there are significant differences in leverage, size, cash flow, liquidity, and capital expenditure between holding and non-holding firms.

Disaggregating the payout ratio by regimes showed that the average payout ratios during the UDI, Independence and Reform were 56, 36 and 38 respectively. However, the descriptive statistics as shown by the Friedman t test showed that the payout ratio did not significantly change across the regimes. Disaggregating the data by industrial sector, however suggests that the payout ratios significantly vary across industrial sectors. The highest payout ratio was reported for conglomerates and the least in the agricultural input sector.

8.3 Corporate financial pattern.

8.3.1 Financing pattern

Using unbalanced data from 51 firms over the period 1990-1999, the results of the analysis show that the Zimbabwean corporate sector mainly depends on internal finance, which was found to be 25 % total financing. Equity finance over the same period contributed 8% of total external financing, while bank loans contributed only 1 %. However, disaggregating the data by industrial sectors, sizes, rate of growth and ownership structure reveal the following patterns. First, the agricultural input sector relies more heavily on internal financing (49 %) than any other sector. Second, larger firms use more internal finance, equity finance and foreign loans than smaller firms. However, trade credit is more important to small firms than to larger firms. Third, the results seem to suggest that firms with high growth rates use more internal, foreign loans and equity finance than low growth firms. Fourth, foreign controlled firms use more internal finance and trade credit than any other firms.

8.3.2 Dividend pattern

The empirical analysis of the dividend patterns shows that the percentage of firms issuing new equity and paying dividends in the same accounting year has substantially increased after financial reform. A possible explanation is that the reform programme has altered the institutional environment. For example easy access to capital markets

for firms and the reduction of capital gains tax from 30 % to 10 % for all shares, which are traded on the stock market.

8.4 The determinants of corporate financial policy

8.4.1 Determinants of capital structures

Using balanced data from 32 firms over the period 1975 to 1999, a model of capital structure was estimated. The first empirical issue was to investigate whether there was a structural change in parameters of the capital structure model. Using interactive regime dummies we found empirical evidence to suggest that the impact of taxation on corporate capital structures shifted in 1980. A possible explanation is that the government, with the aim of redistributing income, significantly changed the tax system in 1980. A document, known as 'growth with equity' was produced in 1980, which resulted in tax rates reaching the highest levels in Zimbabwean history. The results also indicate that the effect of liquidity and firm size on capital structures during the reform was significantly different from the other two regimes.

In order to check for robustness of the results the capital structure model, was re-estimated with more firms (51 firms) and explanatory variables, but concentrating on a shorter period (1995-1999). Using the recent developments in the econometric literature, we estimated a static and dynamic model of capital structure. For the static model, we experimented with 5 alternative measures of leverage and judging from the adjusted R-squared, the results show that the ratio of total liability to book equity is a better proxy for leverage in Zimbabwe. This is in line with the observation that, this measure is widely used in Zimbabwe. The data was then disaggregated into holding and non-holding firms and we then compared the capital structures of holding and non-holding firms over the period 1995 to 1999, and the results from the Wald test statistics suggests that the determinants of capital structure decisions differ significantly between the two groups of firms. The results from the within estimator show that 6 out of 7 determinants significantly explain variation in leverage ratios across holding firms, while only 3 out of the 7 variables are important in explaining capital structure decisions of non-holding firms. This implies that the variables

suggested in the finance literature as major determinants of capital structure are more applicable to larger firms rather than small firms.

Overall, the results suggest that the major determinants of capital structure in Zimbabwe are size, tangibility, growth, taxation, profitability, non-debt tax, capital market conditions (stock liquidity), liquidity, managerial ownership and payout ratio. The results showed that firm size, growth and capital market conditions have a positive impact on leverage ratio while taxation, liquidity, profitability, non-debt tax, managerial ownership and payout ratio have a negative effect. Thus the results support the following hypotheses. (i) the pecking order hypothesis that firms prefer internal financing to external financing, (ii) the trade-off hypothesis that non-debt tax shields reduce the expected gains from leverage, (iii) firms use liquid assets to finance investments, (iv) the agency cost hypothesis that increasing managerial ownership helps to align the interests of managers and shareholders and therefore reduces the role of debt as an agency-conflict mitigating factor, (v) large firms have lower bankruptcy costs and therefore can support more debt than smaller firms, (vi) debt service limits the amount of cash paid out as dividends, and (vii) high growth firms rely on external finance more than low growth firms. On the other hand, the results do not support the two trade-off hypotheses: (i) firms' collateralisable assets provide security to lenders in the event of financial distress, and (ii) corporate taxation encourages corporations to finance their investments by debt.

8.4.2 Determinants of dividend policy

Using the recent developments in panel data estimation (dynamic model) we empirically estimated the dividend stability model first proposed by Lintner (1956). The results are consistent with Lintner's prediction that past levels of dividends and current earnings are the major determinants of corporate dividend behaviour. The results also support the conclusion of Fama and Babiak (1968) that the constant is zero in the Lintner model. Thus the Lintner model describes very well corporate dividend behaviour in emerging markets.

The econometric evidence based on the within estimates suggests that the payout ratio is negatively related to debt ratio, firm size, growth, profitability, firm loss and

managerial stock ownership. However, although block shareholders, institutional ownership and investment have been suggested as potential determinants of payout ratio, in the previous studies, our regression results suggest that these variables do not significantly influence dividend policies of the Zimbabwean corporate sector.

Logit regression results suggest that debt ratio, past levels of dividend, cash flow and institutional investors on one hand increase the likelihood that the firm will pay dividend. On the other hand profit, loss and growth opportunities negatively affect the decision to pay.

The results from the multinomial logit suggest that profitability and cash flow increase the probability of increasing dividends relative to the probability of reducing dividend payment. In addition, investment increases the probability that the given firm will maintain dividends in preference to reducing them. On the other hand leverage and past dividends reduce the probability that a firm will increase dividends in preference to reducing them. The results also show that past levels of dividends and investment have a significant impact on the choice of reducing and maintaining dividends. The lagged dividend variable reduces the probability of choosing alternative *'maintain'* relative to alternative *'reduce'*, while investment increases the probability that the given firm will maintain dividends in preference to reducing them. The major determinants of the decision to increase or maintain dividends are past levels of dividends, size, cash flow and investment. Size, past levels of dividends, and cash flow make it most likely that a given firm will increase dividends rather than maintain them, but investment makes it less likely that the firm will increase dividends.

Finally, we empirically examined the extent to which financing and dividend policy decisions are interdependent. The empirical model account for endogeneity arising from the simultaneity and firm effects problems. Using company accounts data, our major conclusion from this examination is that there is strong evidence of interrelationship between financing (debt) and cash distribution (dividend) decisions. The empirical results strongly support the pecking order hypothesis. The results also suggest that firms with high percentage of insider ownership choose lower levels of both debt and dividend policies. The other result that is consistent with the theory is a

negative and significant relationship between growth and dividend payout. Firms with high ownership concentration have higher payouts. However, contrary to the theory, our results show that tangibility and tax variables have a negative influence on financing decisions.

8.5 Shortcomings and Suggestions for further research

Several lines for further research can be suggested. Firstly, there is a need to investigate the importance of macroeconomic variables in determining corporate financial policies. Secondly, the discrete models used in this study ignore firm and time specific effects, therefore a discrete model that with error component may produce better estimates. Thirdly, the present study has been confined to the period 1975 to 1999. Extending the study to 2002 may produce interesting results since the period 2000 to 2002 is characterised by political instability/economic crises. Thus, it is an opportunity to assess the impact of political instability on the financial behaviour of firms.

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