The value-based management and share price relationship for companies listed on the banking sector of the JSE Ltd.

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Abstract

After the market exuberance of the dot com bubble in the late 1990's, the sobering period that followed the burst brought with it a renewed interest in the concept of shareholder value. Since then, all kinds of companies have been publicly proclaiming their commitment to increasing long-term value for their shareholders. One look at the statements of directors or chief executives in annual reports can confirm this. To a certain extent this is old news. The aim of publicly listed companies has always been to increase the value of shareholders' investment. Value-based management (VBM) was developed to determine whether companies, through management actions, can create value for their shareholders. Value is created when capital is invested at returns higher than the cost for that capital.

VBM is defined as "a managerial process which effectively links strategy, measurement and operational processes to the end of creating shareholder value". It is generally understood to consist of three key elements: creating value, measuring value and managing for value. Since value-based management has appeared in the 1980s, various consulting firms have developed and popularised metrics that can assist management in measuring economic profit. Consultants such as Rappaport and Stewart recognised problems in the traditional accounting measures. As a result, they turned to the concept of sustained shareholder value creation. This has, in turn, led to the development of a number of "value metrics", the most significant of which are: shareholder value analysis (SVA), economic profit (EP), economic value added (EVA) and cash flow return on investment (CFROI).

The main goal of this study was to investigate and determine whether investors can use value-based management metrics as an indicator for share price movement of South African banking companies listed on the Johannesburg Securities Exchange. In order to do this, the respective banks were initially isolated and five individual multiple linear regressions were run. This was done in order to determine whether the results of the specified metrics have an impact on the respective share prices of the individual banks. Subsequently a pooled panel data model was run to determine whether the combined effect of the banks over time could lead to different results. Value-based measurement metrics selected were shareholder value analysis (SVA), economic profit (EP), economic value added (EVA) and cash flow return on investment (CFROI). Other

measurements such as group operating assets (GOA), price per earnings (P/E) and net operating profits after tax (NOPAT) were also tested.

The results from the study indicate that most of the metrics tested cannot be used as indicator for share price movement of these banks. A rise in net operating profits after tax (NOPAT) and price per earnings (P/E) lead to an increase in the banks' share price.

Even though it was found that investors should only use NOPAT or P/E for predicting share prices, companies should still focus on creating value for shareholders. It is beneficial to investors to understand what value-based management is, and to understand management actions in terms of value creation.

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Table of Abbreviations

Acronym	Term
ABC	Activity-based costing
APS	Average price per share for the last month before financial year end
BV	Book value
CEO	Chief executive officer
CFO	Chief financial officer
CFROI	Cash flow return on investment
CVA	Cash value added
DCF	Discounted cash flow
DERO	Discounted equity risk option
EBDIT	Earnings before depreciation, interest and tax
EBIT	Earnings before interest and tax
EBITDA	Earnings before tax, depreciation and amortization
EP	Economic profit
EPS	Earnings per share
EVA	Economic value added
FCF	Free cash flow
FIFO	First in first out
GAAP	General accepted accounting principles
GDP	Gross domestic product
GOA	Group operating assets
LIFO	Last in first out
MVA	Market value added
MVE	Market value of equity
NDA	Non-depreciating assets
NOPAT	Net operating profit after tax
NOPLAT	Net operating profit less taxes
NPV	Net present value
OCF	Operating cash flow
OCFD	Operating cash flow demanded
OLS	Ordinary least squares
PE	Price earnings
PV	Present value
R^2	R-squared

Acronym	Term
RI	Residual income
ROA	Return on assets
ROCE	Return on cash employed
ROE	Return on equity
ROI	Return on investment
ROIC	Return on invested capital
SVA	Shareholder value analysis
TBR	Total business return
TSR	Total shareholder returns
USA	United States of America
VBM	Value-based management
VIF	Variance inflation factors
WACC	Weighted average cost of capital
xVA	Economic value added of weighed company

CHAPTER 1

INTRODUCTION

"No matter what the size of a company is, all managers are duty bound to maximize profits – always bearing in mind that at the end of the day the shareholder value has to increase" – Alfred Brogyányi

1.1 BACKGROUND

Investors in equity markets are profoundly concerned with the performance and valuations of companies listed on the securities exchange. In recent years, an overabundance of new management approaches for improving an organization's performance has emerged, including total quality management, flat organisations, empowerment, re-engineering, team building and so forth. Many approaches succeeded but just as many failed.

A value-based management (VBM) system provides a precise and unambiguous metric – value – upon which an entire organisation can be built. The only true measure of management actions to create wealth, is when capital is invested at returns higher than the cost of that capital (Koller, 1994:87). Basel II provides another impulse for importance. Banking institutions' ratings must be transparent and internationally comparable. Thus it will be difficult to ignore the question of value creation (or destruction) in the course of the rating process. This in turn will make VBM an important measure for a bank wanting to increase its credit worthiness.

It must be remembered that if a company, or in this case a bank, does not satisfy its shareholders, it does not have the flexibility to take care of its employees or the community. In order to create value for shareholders, a company is obliged to in reality surpass investors' expectations regarding its future performance. Since current stock prices inherently include an assumption regarding a certain level of future earnings and cash flow, value is created only when a company in fact performs above these expectations. How and with what tools does the management of an organization determine whether wealth is created and whether the company is creating profit? Does this mean wealth is created for shareholders?

Numerous ratios exist which can test management's wealth creation through profitability, liquidity, asset management and solvency. Such ratios are used to analyze the financial statements of a company. The analysis of financial statements is a judgemental process as not all ratios calculated are helpful in a given situation (Libby, Libby & Short, 2004:709). Relevance to these ratios are given by measuring performance to peer companies.

Deeper analysis can be done by using the Du Pont system by analyzing return on assets (ROA) and return on equity (ROE). The Du Pont system uses both income statement and balance sheet information to break the ROA and ROE ratios into component prices. This system highlights the influence of net profit margin, total asset turnover and financial leverage on a firm's profitability. ROE suffers from accounting and financing distortions (Stewart III, 1994:84). Accounting distortions include stock valuation methods "last in first out" (LIFO) and "first in first out" (FIFO), accrual bookkeeping, the use of successful efforts instead of full cost to account for risky investments and the expense of research and development.

Probably the most closely watched financial ratio of them all is earnings per share (Megginson, Smart & Gitman, 2007:51). Earnings per share (EPS) represents the number of rands earned on behalf of each outstanding share of common stock. The investing public closely watches EPS figures and consider them to be an important indicator of corporate success (Megginson *et al.*, 2007:51).

EPS is unfortunately not an adequate performance measure. It is often a misleading indicator that can result in costly decisions that frequently short-change the common shareholder (Stern & Ross, 2003:171). The EPS criterion confuses investment decisions with financing policies because standardised projects can appear desirable, simply because of the way in which they are financed. It is argued that EPS should be abandoned as an analytical tool for acquisition pricing and financing, and for capital structure planning (Stern & Ross, 2003:171).

Koller (1994:89) describes VBM as a marriage between a value creation mindset and the management process and systems that are necessary to translate the mindset into action. VBM aligns strategy, performance measurement and behaviour in order to maximize shareholder value (Knight, 1998:307). It entails managing the balance sheet

as well as the income statement, and balancing long and short term perspectives (Koller, 1994:87). Value-based management systems and their metrics have become a popular method to align management compensation with shareholder wealth. Variable compensation systems such as economic value added (EVA), market value added (MVA) and free cash flow (FCF) are used. Currently more modern metrics such as shareholder value analysis (SVA), economic profit (EP) (also named residual income (RI)), cash flow return on investment (CFROI) and total business returns (TBR) are in use. The most popular variable compensation systems presently used in the corporate world is the EVA based compensation system (Mohanty, 2006:265).

Developed by Stern Stewart, the idea behind economic value added (EVA) is rooted in economic income as opposed to accounting income. EVA is the difference between net operating profit after taxes (NOPAT) and the cost of funds (Megginson *et al.*, 2007:773). As economic income moves up or down, so does the value of the business. Accounting income or profit is determined without imposing a charge for equity capital. EVA on the other hand is an estimate of the true economic profit of a business for a year. A positive EVA indicates that the company's activities have generated shareholder value over the period of measurement, and that the activities that generated negative EVA values are considered to have lost shareholders value (Lawrie, 2003:1). As long as a company provides for a capital charge in the calculation of its economic profit, it will be able to determine whether value was created or destroyed in the review period.

Market value added (MVA) is the difference between the capital that has been invested, and the market value of the capital. MVA is the assessment within the marketplace on what the net present value is for all investments made by the company. It can also be calculated as the difference between the market value of a firm's stock and the amount of equity capital supplied by shareholders. Companies commonly use MVA as a way of benchmarking performance amongst each other. MVA reflects the performance of the company over its entire life (Brigham & Ehrhard, 2005:112). MVA measurement can be flawed, because the market value might have been created in the initial years of the company, but not in the later years. Management can obtain a false sense of security in such case. Market value of equity (MVE) is the predominant part of calculating MVA. MVE is defined as the total cash value (based on the current market price) of the fully diluted outstanding shares in a company.

Free cash flow (FCF) is the amount of cash flow available to investors – the providers of debt and equity capital. It represents the net amount of cash flow remaining after the firm has met all operating needs and paid for investments – both long term and short term (Megginson *et al.*, 2007:39). Shareholder wealth is influenced by the usage of FCF.

The shareholder value analysis (SVA) approach was developed by Alfred Rappaport in the 1980's. It can be used to estimate the value of the shareholders' stake in a company or business unit, and can also be used as the basis for formulating and evaluating strategic decisions (Starovic, Cooper & Davis, 2004:10). Economic profit (EP) is usually referred to as "residual income" (RI) and can be traced back to the work of economist Alfred Marshall (1890). Starovic *et al.* (2004:11) describe EP as the surplus earned by a business in a period after the deduction of all expenses, including the cost of using investors' capital in the business.

Cash flow return on investment (CFROI), originally developed by HOLT value associates, is an economic profit (cash flow) based corporate performance/valuation framework on economic profit basis, mainly used by portfolio managers and corporations (VBM, 2010). In essence, CFROI is a "real" (i.e. adjusted for the effect of inflation) rate of return measure, which identifies the relationship between the cash generated by a business relative to the cash invested in it.

Technical Change Associates (2010) describe total business return (TBR) as an assessment of financial performance based on annual operating margin, stock appreciation, dividends paid to shareholders and other financial measures. More simply, TBR is the internal equivalent of the external total shareholder returns (TSR) measure, which considers capital gains and dividends received by shareholders.

From the above it can be concluded that value-based management (VBM), its auxiliaries and metrics mentioned will influence the income or profit of a company. The shareholders' wealth will be affected at some stage by VBM and its metrics. The question is: will VBM and these building stone metrics affect the share price of banking companies listed on the Johannesburg Securities Exchange (JSE)?

1.2 RESEARCH STATEMENT

Investors on the JSE are confronted by numerous analyses and ratios helping them to pick the right company's stock to buy at the right time. Before the recession started in 2008, it was easy to gain capital growth on share price. Little attention was given to whether companies are creating shareholder wealth through positive financial statements. Currently investors are going back to basics and are analyzing VBM of chosen companies. They want to answer the question: does VBM and its more recent driving metrics - EVA, EP, SVA and CFROI - influence the share price in the same trend as the company's financial performance? Will banks' financial and economical profit result in a positive or negative share price trend?

1.3 GOALS AND OBJECTIVES OF THE STUDY

1.3.1 Main goal

The main goal of the study is to determine whether VBM and its component metrics can be used as indicator for share price movement for banking companies listed on the Johannesburg Securities Exchange.

1.3.2 Sub-objectives

The sub objectives of this study are the following:

- To investigate and determine to what extent VBM is responsible for share price movement.
- To determine if other measurements can be used as indicator of share price movement.

1.4 RESEARCH METHODOLOGY

The research methods that will be used within this research study are the following:

1.4.1 Literature study

A literature study will be done to provide the reader with a conceptualization of VBM. The literature study focuses on the following:

- VBM principles.
- The link between EVA, EP, SVA, CFROI and share price.

- The relevance and explanation of VBM and its metrics EVA, EP, SVA and CFROI.
- Advantages of using VBM.
- Disadvantages of VBM.
- VBM management and monitoring.

1.4.2 Empirical study

The empirical study will be done by means of a quantitative study as well as statistical data analysis.

Quantitative research will be done on all banking companies listed on the JSE from 1999 – 2009. Historical financial data obtained from McGregor BFA and Bloomberg will be used in order to determine whether a company's EVA, EP, CFROI and SVA have an effect on its share price.

Statistical data analysis will be used to determine whether a relationship exists between the dependent variable (being changes in share price) and the independent variables EVA, EP, CFROI and SVA.

1.5 SCOPE OF THE STUDY

The field of study for this research is financial management. The research focuses on how potential and current investors can use VBM to determine corporate performance, as well as share price movement. Only banking companies listed on the (South African) JSE were considered for this study.

1.6 LIMITATION OF THE DISSERTATION

There are certain limitations to this research. Not all data of the companies are available at a specific time. Only companies listed in the banking sector are considered, therefore other companies within the overall financial sector are ignored. MVA is measured through the lifetime of a company. For this reason it is difficult to measure a relationship with other data gathered on an annual basis. In this study only, MVE will not be used for statistical data analysis. Another limitation of the study is that Capitec bank has only recently listed on the JSE and very little data is available for the measurement period 1998 - 2008.

1.7 LAYOUT OF THE STUDY

Chapter 1 consists of the introduction, the problem statement and the research propositions formulated for the research project. *Chapter 2* presents the literature review and the empirical research. Subjects discussed in this chapter will include: VBM principles, advantages and critique. The link between EVA, EP, CFROI, SVA and share price, as well as the formulation of VBM strategies and the monitoring thereof will also receive attention. *Chapter 3* will consist of the results of the investigation analyzed to determine whether there is correlation between the dependent and independent variables, followed by *Chapter 4* containing conclusions and recommendations drawn from the qualitative and quantitative research.

CHAPTER 2

LITERATURE STUDY

"There is no time when you can sit back and admire your achievements. The measurement is obvious to all, both inside and outside of the company. There is no hiding place." - Sir Brian Pitman

2.1 INTRODUCTION

It has been witnessed in the recent accounting scandals, the extremes of how companies can be run for seemingly everything else except the owners' best interests. The collapse of Enron and Parmalat destroyed value for both their shareholders and their stakeholders, such as the thousands of employees who lost jobs and pensions. There are also companies, such as Macroni, that failed as a result of strategic errors, not fraud. Shareholder value has long been the focal theme to the financial economist. How does a company know whether it is creating value for shareholders? Will a company know whether it is performing well?

Despite the lack of universal definitions, all value-based management (VBM) programmes have in common the basic premise that profit needs to be measured in a way that takes into account the cost of the capital employed to generate it. In recent years the easy access to trading platforms and the effortless retrieval of financial and company data created a new generation of shareholders. Shareholders are much more educated and are no longer willing to remain passive. They want access to the boardroom in an effort to stimulate the performance of the selected portfolio companies.

If a bank or company wants to manage for shareholder value, the first thing they need to do is to identify just what drives shareholder value. An issue that frequently arises in this regard is whether share value reflects a firm's quarterly earnings or encompasses the future cash flow generating potential for the firm. Financial asset managers would argue that investors are far too concerned about current firm earnings to the exclusion of a firm's future prospect. On the other hand, some argue that markets are farsighted and do reflect the current value of a firm's future earnings potential.

We would be negligent if we did not recognize the seriousness of the options on both sides of this issue. In recent years, value-based systems or metrics were developed to

provide management with tools to help choose and manage the correct options. Value based management and economic value added attracted considerable interest among organizations in recent years (Ikäheimo & Malmi, 2003:237).

2.2 VALUE-BASED MANAGEMENT

Defining VBM is not easy. There is, on the one hand, a broad context of generating value for shareholders that is at the heart of the market economy. But there is also a more specific concept that narrows VBM into a management approach, or even a philosophy, characterised mainly by the metrics used to measure performance.

2.2.1 Origins and development of value-based management

In concept, VBM reduces agency conflicts and helps create shareholder value since it reveals value increasing decisions to employees, allows for easier monitoring of managers' decisions and provides a method to tie compensation to outcomes that create shareholder value. The principal claim of VBM is that the company must build on the core concept of value. The firm's organization, strategy, processes, communication, everything it does, must be consistently aligned with the key drivers of value (Moskalev & Park, 2010: 49). The ultimate objective of VBM is that value is maximized where value can be defined in financial and non-financial terms.

Through the 1990's an abundance of new management approaches for improving a company's performance were developed. Koller (1994:87) lists total quality management, flat organizations, empowerment, continuous improvement, re-engineering, kaizen and team building as some of these approaches. Moskalev and Park (2010:49) noted that non-financial metrics of value creation concern the satisfaction of related parties, including employees, customers, suppliers as well as other important participants such as government and social entities (i.e. other stakeholders). Some of these approaches succeeded, but just as many failed. Failure of these approaches can be traced to the unclear and not properly aligned targets with regard to the ultimate goal of creating value.

More traditional financial metrics of value creation are based on discounted cash flows as well as earnings and earnings growth. Koller (1994:87) is of opinion that if such metrics are used effectively and efficiently in a VBM structure, it will tackle failures and

problems head on. The reason given is that an entire organization can be built upon providing precise and unambiguous metrics. "The fundamental premise underlying VBM systems is simple: what a firm measures and rewards gets done" (Martin & Petty, 2000:160).

Financial economists have long recognised that the ownership of large modern corporations is widely dispersed among equity holders. These equity holders generally hold small ownership stakes in these firms. In an early influential work, Berle and Means (1932) argued that since the ordinary small shareholder has little interest in the daily management of the firm and most other shareholders who make up the majority ownership of the firm exhibit similar behaviour, managers and directors who actively run the firm have the ability to divert corporate resources for personal advantage without scrutiny from shareholders.

The concept of value-based management appeared in the U.S.A in the 1980's, and value-based management has been pursued in Western enterprises since the 1990's (Wang, Zhang & Man, 2006:36). VBM has captured the interest of corporate and investment communities. Ryan and Trahan (2007:113) report that 87% of the 86 CFO's surveyed in their study, indicated that they were familiar with VBM. Most of these CFO's also indicated that their firm use one or more VBM systems. The CFO's expressed a desire to know more about the impact of financial decisions on stock prices, the impact of institutional and managerial ownership on stock prices and the impact of short-sighted management.

VBM has attracted considerable interest among organisations in recent years. It has become a hot topic in financial management and so has the process of finding the holy grail of measuring it. Consulting firms made it a main focus to develop metrics to help organisations to implement VBM. Traditional performance metrics such as earnings per share (EPS), book value (BV), return on equity (ROE), return on assets (ROA) and return on invested capital (ROIC) do a poor job of capturing the three fundamental determinants of value creation: the amount, timing and risk of the future cash flows of a company (Morin & Jarrell, 2001:309). The use of these accounting figures should be abandoned when VBM is adopted (Ehrbar, 1998:67). There are more popular metrics which can be implemented.

Ryan and Trahan (1999:47; 2007:113-114) provide examples of metrics which can be used as an alternative to traditional performance metrics:

- Discounted cash flow (DCF): The market value of an organisation expressed as the present value of its expected future cash flows, discounted back to the present at the organisation's cost of capital. Megginson *et al.* (2007:173) explains the calculation of the DCF process in three steps: determine the assets' expected cash flows, choose a discount rate that reflects the assets' risk and calculate the present value.
- Cash flow return on investment (CFROI): CFROI expresses an estimate of an organisation's single period cash flow as a percentage of total investment. The CFROI valuation model is used when it is assumed that the stock market sets prices based on cash flow, not on corporate performance and earnings.
- Return on invested capital (ROIC): ROIC is defined as the ratio of net operating profits less adjusted taxes (NOPLAT) to invested capital. ROIC is a calculation used to assess a company's efficiency through allocating the capital under its control to profitable investments.
- Residual income (RI): RI measures the excess earnings over a capital charge based on investment opportunities of similar risk. Basically it comes to the amount of income that an organisation has after all debts, including the mortgage, have been paid. This calculation is usually made on a monthly basis, after the monthly bills and debts are paid.
- Economic value added (EVA) (popularised by Stern Steward & Co.). The EVA metric, which has been trademarked by Stern Steward, is a residual income type measure of economic profit. Stern Steward computes EVA as net operating profits after taxes minus a capital charge, computed as the company's adjusted book value of capital times its market determined cost of capital.

EVA has been very popular among organisations in recent years. EVA measures the excess of earnings over the minimum return that shareholders could get by investing capital in companies of similar risk (Ryan and Trahan, 1999:47). EVA is the difference between net operating profits after taxes (NOPAT) and the cost of funds (Megginson *et al.*, 2007:773).

Metrics also developed but less used by organisations are cash value added (CVA) and return on capital employed (ROCE). Investopedia (2010) defines CVA as a measure of the amount of cash generated by a company through its operations. It is computed by subtracting the operating cash flow demand (OCFD) from the operating cash flow (OCF) in the cash flow statement. OCF is the sum of earnings before depreciation, interest and tax (EBDIT), adjusted for non-cash charges, working capital movement and non-strategic investments. OCFD represents the cash flow needed to meet the investor's financial requirements on the organisation's strategic investments. ROCE is another measure that can be used to calculate the efficiency and profitability of a company's capital investments (VBM, 2010). ROCE is calculated by dividing earnings before interest and tax (EBIT) by the difference between total assets and current liabilities.

Table 2.1 gives a summary of six financial or consulting company's preferred VBM metrics.

Table 2.1: Preferred metrics of six financial or consulting companies

Stern Steward & Co	Marakon Associates	McKinsey & Co	Price Waterhouse Coopers	L.EK. Consulting	HOLT Value Associates
MVA (Corporate) **EVA** (Corporate business unit & product line)	**Equity spread** (Corporate) **EP** (Corporate business unit & product line)	**DCF** (Corporate business unit) **EP** (Corporate business unit & product line)	**CFROI** (Corporate) **SVA** (Corporate business unit) **FCF** (Corporate business unit)	**SVA** (Corporate operating level) **Change in RI or EVA** (operating level) **Leading indicators of value** (operating level)	**CFROI** (Corporate) **Accounting based measures** (lower levels)

(Source: Adapted from Ameels *et al.*, 2002:27).

Table 2.1 shows the different metrics preferred by selected financial and consulting companies. From the table it can clearly be seen that not all companies prefer the same metrics. Not all firms derive the same benefits from implementing a definite VBM metric. Measuring performance and choosing the right metric is more problematic for companies in rapidly changing markets (i.e. high tech companies) where value is tied more closely to the firm's future growth opportunities than with its assets in place (Martin & Petty, 2001:2). When implementing a VBM system or metric there seems to

be no holy grail to be followed. Management can only guide or strengthen decisions by dividing their corporate performance by means of managing a longer term view or managing the organisation's balance sheet.

2.2.2 Value-based management principles

Moskalev and Park (2010:56) argues that, in context of VBM, South Korea's 1997 financial crisis should be viewed as a consequence of the chaebols' (South Korean industrial conglomerates) systematic deviation from the principles of VBM. VBM has its roots in economics and finance, but it is dependent on a firm's financial accounting and reporting as a starting point in computing metrics used (Frigo, 2002:1).

The question remains: what does VBM stand for? What is VBM's ideology? Value-based management is a strategic measurement initiative organisations embark on to focus internal performance and incentives on value creation. VBM is particularly useful as the basis for incentive compensation, resource allocation, investor relations and other areas (Frigo, 2002:1). Organisations that adopted the VBM principles made use of executive compensation, and further incentive compensation firm-wide. The premise is: pay for performance, where performance leads to value creation (Frigo, 2002:1).

From another viewpoint, Martin and Petty (2001:2) derive VBM's essence through transforming behaviour in such a way that it encourages employees to think like owners. To tie employee-level-performance to owner-level-rewards, a foundation is laid out for building a capital-market-focused measurement and reward system. Martin and Petty (2001:2) state that value is only created when managers are actively engaged in the process of identifying good investment opportunities and taking steps to capture the value potential of these opportunities. Value creation requires management to be effective in identifying, growing and harvesting investment opportunities (Martin & Petty, 2001:2).

Teemu Malmi and Seppo Ikäheimo did a study on value-based management practices with evidence from the field. The literature Malmi and Ikäheimo used suggests that VBM means the use of certain control principles, which are assumed to have impact on decision making. On the other hand, the VBM literature also suggests that certain heuristics should be used in making decisions at all levels of an organization (Ikäheimo & Malmi, 2003:240). From the study done by Malmi and Ikäheimo, key elements of VBM

were exposed. The key elements exposed differentiate VBM from other management approaches. These elements of VBM are:

- Aim is to create shareholder value.
- VBM identifies the value drivers.
- It connects performance measurement, target setting and rewards to value creation or value drivers.
- VBM connects decision making and action planning, both strategic and operational, to value creation or value drivers.

Koller (1994:87) describes VBM as focusing on better decision making at all levels in an organisation. VBM recognises that a top-down command and control structure is inefficient in large multi-business operations. Thus VBM entails managers to use value-based performance metrics in decision making. VBM entails managing the balance sheet as well as the income statement, and balancing long and short term perspectives (Koller, 1994:87).

Ryan and Trahan (2007:111) state that value-based management systems provide an integrated management strategy and financial control system intended to increase shareholder value by mitigating agency conflicts. VBM systems attempt to accomplish this goal by providing managers with a set of decision making tools (metrics) that identify which alternatives create or destroy value, and often by linking compensation and promotions to shareholder value (Ryan & Trahan, 2007:113). Currently there is a heightened pressure for corporations to focus on maximizing shareholder value. Ryan and Trahan (1999:47) put this down to the increased competition in the managerial labour and capital markets. Other factors contributing to this increased pressure are hostile takeovers, institutional investors with large equity positions in corporations, more active boards of directors, and increasingly competitive global capital markets (Ryan & Trahan, 1999:46).

Starovic *et al.* (2004:3) claim that to define VBM is a difficult charge. There is, on the one hand a broad context of generating value for shareholders that is at the heart of the market economy. But there is also a more specific concept that narrows VBM into a management approach, or even a philosophy, characterised mainly by the metrics used to measure performance. Starovic *et al.* (2004:4) further argue that the term value-based management and acronyms such as VBM or MSV (managing for shareholder

value) were not used until the mid-1990s by authors such as Copeland and McTaggart. McTaggart defines VBM as: "…a formal, systematic approach to managing companies to achieve the objective of maximising value creation and shareholder value over time" *(*McTaggart *et al.*, 1994 *in* Starovic et al., 2004:4), whereas Copeland sees value-based management as: "… an approach to management whereby the company's overall aspirations, analytical techniques and management processes are all aligned to help the company maximise its value by focusing management decision making on the key drivers of value" *(*Copeland *et al.*, 2000:65).

Wang *et al.* (2006:39) go as far as to say that VBM defines the key goal of management activity as the maximization of enterprise value. "In order to realize the maximum of enterprise value, it's necessary to minimize the risk that enterprises face, maximize cash flow and the ability of continuing operating." (Wang *et al*., 2006:39). Stewart (1999:1) confirms Wang *et al.'s* opinion by claiming that the maximization of a firm's current market value is the most important job of senior management. Many companies' all-important quest for value is being confounded by hopelessly obsolete financial management systems where the wrong financial goals, performance measures and valuation procedures are emphasised, while managers are improperly, and in many cases inadequately, rewarded (Stewart, 1999:781).

The problem with Wang and Stewart's views of maximizing market value is that the market value approach ignores the capital employed to create it. The market value approach is also a short term approach that can be detrimental in the long run, as investment decisions made using this approach, are based on short term results.

2.2.3 Advantages of value-based management

According to Frigo (2002:1) when VBM is correctly implemented it will help to focus management on value creation and motivate and guide activities toward this end. The highest tenet of return driven strategy is to ethically manage for maximum financial value creation. But this requires a disciplinal commitment, leadership and the right metrics. VBM can play an important role here (Frigo, 2002:1). Koller (1994:87) states that VBM brings tremendous benefits when it is well implemented. VBM is similar to restructuring in order to achieve maximum value on a continuing basis, and it has high impact, often realised in improved economic performance.

Starovic *et al.* (2004:16-21) are of opinion that certain criteria of shareholder value will be positively influenced by VBM. These criteria are:

- *Governance and ownership*: Other safeguards, in the form of corporate governance codes and practice, making sure the owners' and managers' interests are aligned entail fostering open and honest communication and active interest from shareholders.

- *Remuneration*: Value-based management agenda must include an attempt to align – or at least reconcile – the interests of the two parties. The most obvious way in which this can be done is by allowing employees to share directly in the benefits they helped create. This effectively means paying them in a way that makes them behave more like owners, by linking their rewards to a long-term growth in value.

- *Culture*: Five elements of cultural transformation shared by companies where VBM programmes have been successful:
  - Nearly all made an explicit commitment to shareholder value.
  - Through training, they created an environment receptive to the changes that the programme would engender.
  - They reinforced the training with broad-based incentive systems that were closely tied to the VBM performance measures and which gave employees throughout the company a sense of ownership in both the company and the programme.
  - They were willing to make major organisational changes that would allow their workers to make value creating decisions.
  - The changes they introduced to the company's systems and processes were broad and inclusive rather than focused narrowly on financial reports.

- *Structure*: Determining the best organisational structure enables managers to achieve the greatest clarity in deciding where, how and how much value is being, or could be, created within each business unit and within the company's total portfolio. Determining the right roles and responsibilities enables managers to achieve the highest degree of accountability for creation and destruction of value.

- *Stakeholders*: Although VBM may seem to be all about shareholders, the actual process of value maximisation cannot bypass wider stakeholder concerns. It is important to remember that companies can only really increase wealth for their shareholders if they produce outputs that meet the needs of society.

Cooper *et al.* (2001) summarise the advantages associated with the adoption of the techniques of VBM:

- Provides a common language - usable internally and externally.
- Powerful comparative tool - in terms of benchmarking competitive performance.
- Useful for resource allocation - better discrimination between value-creating and value-destroying investment.
- Positive effect on financial performance - achieved through reductions in capital base.
- Powerful strategic tool.
- Regarded as very useful tool to help management focus upon value drivers.
- Helps create more shareholder value by getting more accountability for discrete business units.

2.2.4 Disadvantages of value-based management

Many companies have tried and failed to implement a structured value maximising programme. The Ernst & Young 2003 survey of management accounting showed that only 30% of companies claim to use VBM extensively and roughly the same number have tried and subsequently rejected it (Starovic *et al.,* 2004:22). The use of a VBM system alone does not always reflect all the pathways to value creation. Frigo (2002:2) mentions that the integration of VBM with a balanced scorecard framework can provide a way to avoid value creation limitations. Koller (1994:88) states that a pitfall or disadvantage of VBM is it can become a staff-captured exercise that has no effect on operating managers at the frontline or on the decisions these frontline managers make. VBM (2010) provides further disadvantages of value-based management:

- VBM is an all-embracing, holistic management philosophy, which often requires culture change. VBM programmes are typically large-scale initiatives that take considerable time, resources and patience to be successful.
- Value creation may sound simpler than corporate strategy but is not, because it is actually more or less the same.

- Economic value added, performance management and the balanced scorecard are very powerful management support tools and processes, but each has its own costs.
- It is of the utmost importance to measure the right things, because if not, it could lead to value destruction.
- VBM requires strong and explicit CEO and executive board support.
- Comprehensive training and management consultancy are advisable or even necessary, but can be quite costly.
- The perfect VBM or valuation model has not been invented yet. Any method chosen will have certain drawbacks, which should be taken into account.

Howard Dodd, Boots plc finance director, recently explained why his company had been forced to make amendments to its previously successful VBM programme (Dodd, 2004). The focus on maximising net present value (NPV) meant that many projects with high NPVs but long paybacks and poor short-term returns were accepted by the company. This in turn meant that there was underinvestment in the core retailing businesses since returns here were judged to be too low in comparison.

Managers find the company lack the resources, or the commitment needed to make any real headway. Implementation is usually costly. Most boards initially employ consultants, which is a significant expense. Then there is investment in training and the opportunity cost of time devoted to the programme (Starovic *et al.,* 2004:22).

Cooper *et al.* (2001) summarise the disadvantages associated with the adoption of the techniques of VBM:

- Different forms of VBM and methods complicate tasks.
- Relatively disappointing at the subordinate business level because of the difficulty of forecasting value.
- Managerial costs of implementation.
- The degree of complexity in the calculation was a limitation.
- Difficult to translate the financial measures into operating customer measures.
- Technical measurement difficulties - such as the cost of capital.

2.2.5 Shareholder value

It is one thing to say that companies ought to be managed for shareholder value but quite another to try to provide guidance on the best way of achieving this. Creating value is not about applying a prescribed set of tools or processes but about creating competitive advantage in the marketplace. Strategy lies at the heart of enterprise success: "Managing for value begins with strategy and ends with financial results." (Duyck, 1998:102). Management must first and primarily identify what drives shareholder value before the management thereof can be started.

Another segment of shareholder value is to decide over which time frame it will be managed. Will management use quarterly earnings or make use of future cash flow potential of the firm? Shareholder value is a key focus for managers and involves improving the worth of the business from the shareholders', or owners', perspective. Shareholders are usually interested in increased profitability, increased share price and dividends, and management is charged with the responsibility of delivering this (Correia *et al.,* 2008:6).

Rappaport (2006:76) is of the opinion that value-creating growth is the strategic challenge for most organisations, and to succeed, companies must be good at developing new potentially disruptive businesses. The bulk of companies' share price reflects the expectation for the growth of a company's current business and if these expectations are met, shareholders will earn a normal return. To achieve superior long-term returns, a company must be able to increase its share price faster than that of its competitors, and this is achieved by either constantly exceeding market expectations or through new business opportunities. A company that is focused on creating long-term shareholder value is a first mover in a market and creates formidable barriers to entry through scale or learning economics, positive network effects, or through reputational advantages (Rappaport, 2006:77).

Several decades of consulting experience and research helped Alfred Rappaport to set out ten basic governance principles for value creation that collectively will help any company with a sound, well-executed business model. The use of the principles will better realise the potential for creating shareholder value. The ten principles are described by Rappaport (2006) as follows:

<u>Principle 1</u>: Do not manage earnings or provide earnings guidance.

Companies that fail to embrace this first principle of shareholder value will almost certainly be unable to follow the rest (Rappaport, 2006:3). Research conducted shown that 80% of respondents would decrease value-creating spending on research and development, advertising, maintenance and hiring, in order to meet earnings benchmarks, and more than half would delay a new project even if it entailed sacrificing value. Rappaport (2006:3) gives some reasons why a company should not focus on earnings:

- The accountant's bottom line approximates neither a company's value nor its change in value over the reporting period.
- Organisations compromise value when they invest at rates below the cost of capital or forego investment in value creating opportunities in an attempt to boost short term earnings.
- The practice of reporting rosy earnings via value destroying operating decisions of stretching permissible accounting to the limit. This is done in order to report glowing earnings and will eventually catch up with the company.

<u>Principle 2</u>: Make strategic decisions that maximize expected value, even at the expense of lowering near term - earnings.

Companies should evaluate strategic decisions against expected incremental value of future cash flows rather than to evaluate it against reported earnings. Sound strategic analysis by a company's operating units should produce informed responses to three questions: *First, how do alternative strategies affect value? Second, which strategy is most likely to create the greatest value? Third, how sensitive is the value of the most likely scenario to variables such as shifts in competitive dynamics, technology life cycles, regulatory issues, and other relevant variables?*

At the corporate level, executives must also address the following three questions: *First, Do any of the operating units have sufficient value-creation potential to warrant additional capital? Second, are the operating units that do not have potential, candidates for restructuring? And thirdly, what mix of investment in operating units is likely to produce the most overall value?* (Rappaport, 2006:4-5).

<u>Principle 3</u>: Make acquisitions that maximize expected value, even at the expense of lowering near-term earnings.

Companies typically create most of its value through day-to-day operations, but a major acquisition can create or destroy value faster than any other corporate activity. Companies and their investment bankers usually consider price per earnings (P/E) multiples for comfortable acquisitions and the immediate impact of earnings per share (EPS) to assess the attractiveness of the deal.

This norm used by these companies when considering an acquisition, is to evaluate the impact on the earnings per share of the company, but it does not say anything about the deal's long-term potential to add value. Management must be able to identify when, where and how real performance gains can be achieved by estimating the present value of the resulting incremental cash flows and then subtracting the acquisition premium (Rappaport, 2006:5).

<u>Principle 4</u>: Carry only assets that maximise value.

Principle 4 guides the choice of business model that value-conscious companies will adopt. There are two parts to this principle: *First, value-orientated companies must regularly monitor whether there are buyers willing to pay a meaningful premium above the estimated cash flow value to the company for its business units, brands, real estate, and other detachable assets. Secondly, companies can reduce the capital employed and increase value by focusing on high-value activities such as research, design and marketing, where the company enjoys a comparative advantage. Companies can also outsource low value-added activities that can be reliably performed by others at lower cost, such as manufacturing* (Rappaport, 2006:5-6).

<u>Principle 5</u>: Return cash to shareholders when there are no credible value-creating opportunities to invest in the business.

Even companies that base their strategic decision making on sound value-creation principles can slip up when it comes to decisions about cash distribution. Value-conscious companies with large amounts of excess cash and limited value-creating investment opportunities, returns money to its shareholders through dividend and share

buy-backs. By giving investors some money back the shareholders are able to invest this money in other value-adding opportunities. Companies can also buy back shares to give its EPS an improvement. The buy-back of shares are only done when management feels the stock is trading below its estimated value. In contrast when a company's share price is too expensive, management can create good long term value by paying out dividends.

Principle 6: Reward CEOs and other senior executives for delivering superior long-term returns.

Companies need effective pay incentives at every level to maximize the potential for superior returns (Rappaport, 2006:6). Standard stock options are an imperfect medium for motivating long term, value maximizing behaviour in senior executives. There are three reasons for this: *Firstly, standard stock options reward performance well below superior return levels. In a rising market, executives realise gains from any increase in share price. Secondly, the typical vesting period for stock options is between three and four years, and coupled with executives' inclination to cash out early, the long-term motivation that is intended with stock options is diminished. Finally, when options are hopelessly below strike price, the ability of these stock options to motivate is lost.*

The above shortcoming can be overcome if companies adopt either a discounted indexed-option plan or a discounted equity risk option (DERO) plan. Indexed options reward executives only if the company's shares outperform the index of the company's peers - not simply because the market is rising (Rappaport, 2006:7).

Principle 7: Reward operating-unit executives for adding superior multiyear value.

Stock option programs are useful to corporate executives whose job it is to increase the performance of the company. Ultimately these programs are useless and inappropriate for rewarding operating unit executives who have limited impact on the overall performance of the company. Companies typically have both annual and long-term incentive plans that reward operating executives for exceeding goals for financial metrics, such as revenue and operating income, and sometimes beating non-financial targets as well (Rappaport, 2006:7). Share value added (SVA) was developed as a metric to measure performance of operating units and thus made it possible to create

incentives. SVA is calculated by applying standard discounting techniques to forecast operating cash flow, and then subtracting investments made during the period.

SVA is entirely based on cash flows and to make sure this metric captures long term performance, companies should extend the performance evaluation period to at least a three year rolling cycle. A portion of the payout can be retained by management for coming periods' non-performance. This approach eliminates the need for two plans by combining the annual and long-term incentive plans into one (Rappaport, 2006:7). SVA eliminates budget-based thresholds, and standards are developed for superior year-to-year performance improvements, peer benchmarking, and performance expectations implied by the share price.

Principle 8: Reward the middle managers and frontline employees for delivering superior performance on the key value drivers they influence directly.

Middle managers and frontline employees need active and recent direct information to guide them in their day-to-day activities. In such case SVA is not an appropriate metric as it is not able to do so. Rappaport (2006:8) suggests from his experience that most businesses can focus on three to five leading indicators and at the same time capture an important part of the indicators' long-term value-creation potential. The improvement on leading-indicators performance will achieve superior SVA and in turn will increase long-term shareholder value.

Principle 9: Require senior executives to bear the risks of ownership just as shareholders do.

The ability of senior executives and shareholders to sell shares early after receiving it can motivate both parties to only focus on near or short term earnings instead of focusing on long term value which will increase share price. Companies should try to align these interests of all parties involved. An approach developed by companies is to adopt a stock ownership guideline for senior management. The ownership will increase managers' willingness to take more risks to increase the value of the business and widen the company's portfolios. Two other possible ways of balancing executives' and shareholders' risks are to extend the period before executives can unload shares through the exercise of options, and not to count restricted grants as shares.

<u>Principle 10</u>: Provide investors with value-relevant information.

Principle 10 governs investor communication such as financial reports in a company. Better disclosure not only offers an antidote to short term earnings obsession but also serves to lessen investor uncertainty and so potentially reduce the cost of capital and increase the share price. Rappaport (2006:10) developed a "Corporate Performance Statement", which sets out to do the following:

- Separates out cash flows and accruals, providing a historical baseline for estimating a company's cash flow prospects and enabling analysts to evaluate how reasonable accrual estimates are.
- Classifies accruals with long cash-conversion cycles into medium and high levels of uncertainty.
- Provides a range and the most likely estimate for each accrual, rather than the traditional single point estimates ignoring the wide variability of possible outcomes.
- Excludes arbitrary, value-irrelevant accruals, such as depreciation and amortisation.
- Details assumptions and risks for each line item while presenting key performance indications that drive the company's value.

Absence of such information should cause shareholders to ask questions whether management has a comprehensive grasp of the business and whether the board is properly exercising its oversight responsibility. Executives in well-managed companies already use this type of information contained in a corporate performance statement, supporting the argument that the disclosing of such information is not costly.

Rappaport (2006:3) points out that no company – with the possible exemption of Berkshire Hathaway - gets near to implementing all these principles. Following these ten principles will serve the long term interests of shareholders.

Rappaport (1998:56) created the shareholder value network shown in figure 2.1.

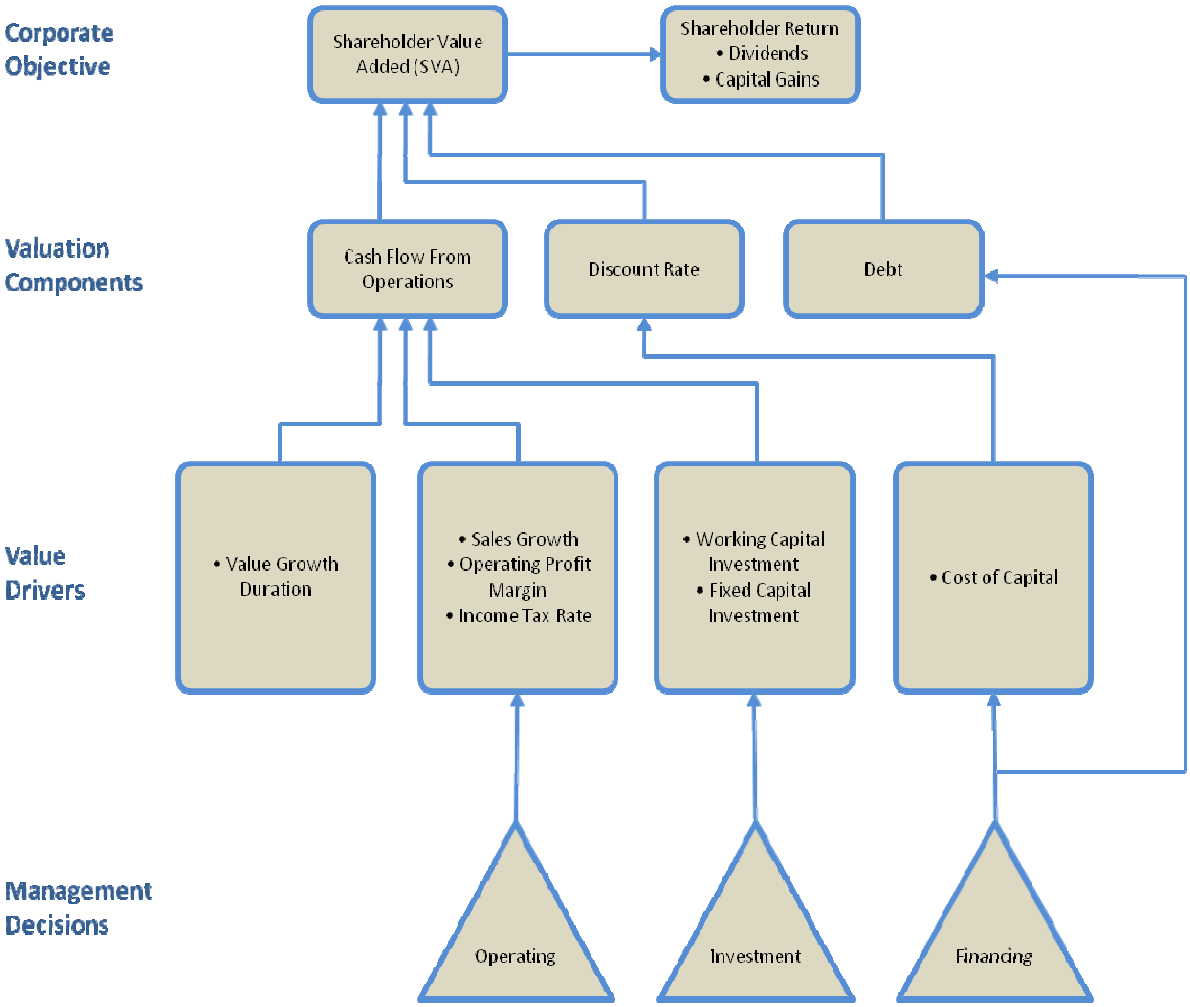

Figure 2.1: Shareholder value network
(Source: Adopted from Hakel, 2000:6).

Mauboussin (2009:1) states that managers create shareholder value when they invest to maximize the present value of long-term free cash flows. Investments include capital spending, research and development, mergers and acquisitions (M&A), and share repurchases. These investments also include managing human capital, the task of putting the right people in the right jobs. The term "value" is also crucial to the concept of creating shareholder value. The premise is that if a company builds value, the stock price will eventually follow. The objective is to build value and let the price reflect that value. Executives adhering to shareholder value principles manage for value, not price. Figure 2.1 shortly groups the order of creating shareholder value by using the above-mentioned.

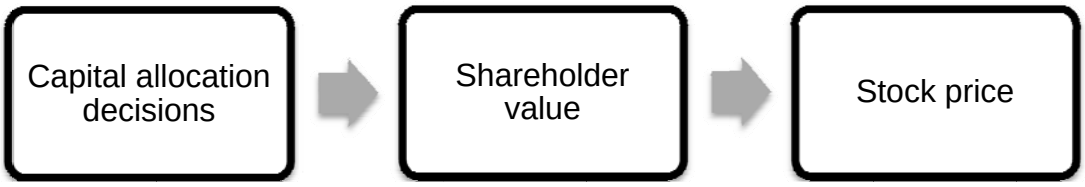

Figure 2.2: Creating shareholder value
(Source: Mauboussin, 2009:2).

Mauboussin (2009:2) condemns the mindset that suggests executives make decisions based on what is perceived to increase the stock price. Tragically, these decisions are often at direct odds with true shareholder value principles, even as if wrapped in the same label. A survey of chief financial officers revealed that nearly 80% of the interviewed CFOs would be willing to forego value-creating projects in order to deliver smooth earnings. The premise behind this choice is that a cosmetic improvement in earnings would lead to a higher immediate stock price than would a true value-creating investment (Mauboussin, 2009:2).

When a proper shareholder-value mindset is in place, executives allocate capital so as to maximize the present value of long-term free cash flows. Free cash flow (FCF) represents the pool of cash available for distribution to debt and equity claimholders. FCF takes into consideration all taxes and investment needs but does not include financing costs such as interest expense.

Table 2.2: Definition of Free Cash Flow and Relevant Stakeholder

Financial statement items	**Relevant stakeholders**
Sales	Customers
- Expenses/Investments	Suppliers, employees
- Taxes	Government
= Free cash flow	

(**Source**: Adapted from Mauboussin, 2009:7).

From Table 2.2 it can be argued that, to maximize long-term FCF, a company must properly manage its relationships with key stakeholders. Sales are the result of a relationship with customers. Companies that charge too much for goods or services will lose out to the competition or will fail to entice customers. Companies that charge too little may have happy customers but will be unable to meet financial obligations, like paying employees and suppliers. So, a successful shareholder-value-orientated

company must find the price that adds value for the customer and the company (Mauboussin, 2009:6). Companies that manage to maximize shareholder value must effectively deal with all of its stakeholders. The shareholder value approach acknowledges the difficult trade-offs that corporate executives face. One point is clear: a company cannot maximize shareholder value through systematic exploitation of its stakeholders.

The present value of future free cash flows, including a residual value, equals corporate value (Mauboussin, 2009:7). To achieve shareholder value, one has to reduce corporate value by debt and other liabilities. Shareholder value is based on a residual claim. Table 2.3 gives a short practical explanation of how shareholder value is achieved by reducing corporate value, by means of debt and other liabilities. Table 2.3 also shows how payouts are made to shareholders after the company has satisfied the claims of all the other stakeholders.

Table 2.3: Definition of Shareholder Value and Relevant Stakeholders

Financial item	**Relevant Stakeholder**
Corporate value (PV of FCF)	Debt holders
- Debt	Employees
- Other liabilities	Shareholders
= Shareholder Value	

(Source: Adapted from Mauboussin, 2009:7).

Mauboussin (2009:7) argues that the key principle to managing for shareholder value is to invest so as to generate a return in excess of the cost of capital. The cost of capital in this instance will represent the opportunity cost of capital providers, including the debt holders and shareholders.

The most important quality of creating shareholder value is that it must be sustainable. Value is created over time as a result of a continuing cycle of strategic and operating decisions (Martin & Petty, 2001:6). Management should be focused from one year to another, on creating value to administer a continuous value creation process. Figure 2.3 points out the key elements of a VBM system designed to build and support a sustainable cycle of shareholder value creation.

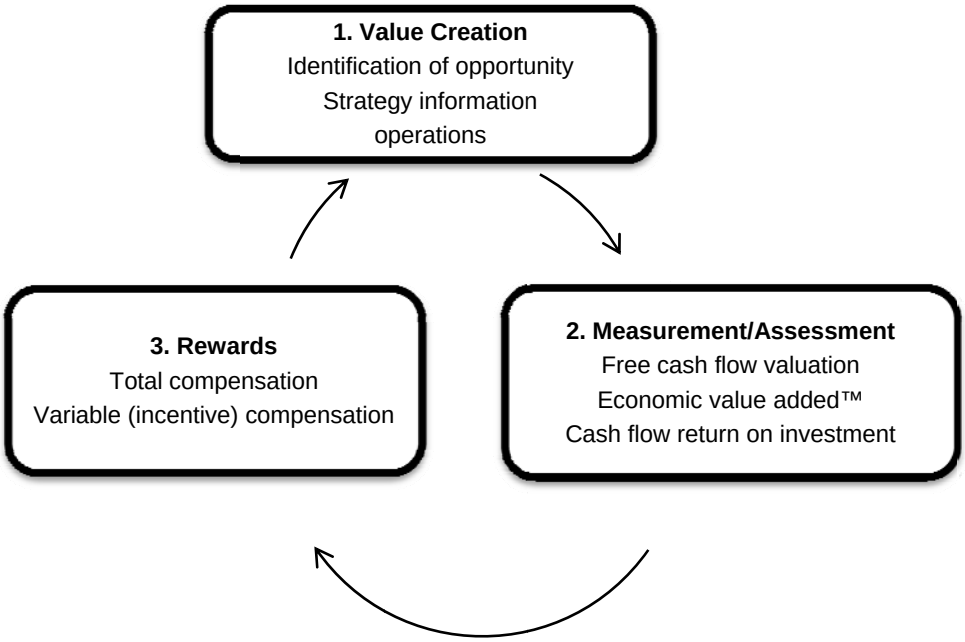

Figure 2.3: Constructing a sustainable cycle of value creation
(Source: Adapted from Martin & Petty, 2001:6).

2.2.6 Value drivers of value-based management

Koller (1994:91) states that an important part of VBM is the deep understanding of the performance variables that will actually create value in a business. The understanding of these variables is of importance because a company cannot act or react directly on value. Companies act on variables that influence value such as customer satisfaction, cost, capital expenditures and production factors.

About a century ago, Du Pont created a metric concept called the value driver tree, which splits value-based metrics such as EVA and ROI into sub-metrics to show the source of the value added (Obermatt, 2010). The value drivers for non-financial organisations include measures of growth, margins, capital efficiency and leverage. In the case of financial institutions the assumptions must be based on the fact that financing is part of operations. The original value driver tree for non-financial (Figure 2.4) institutions is based on the assumption that financing is not part of operating the business.

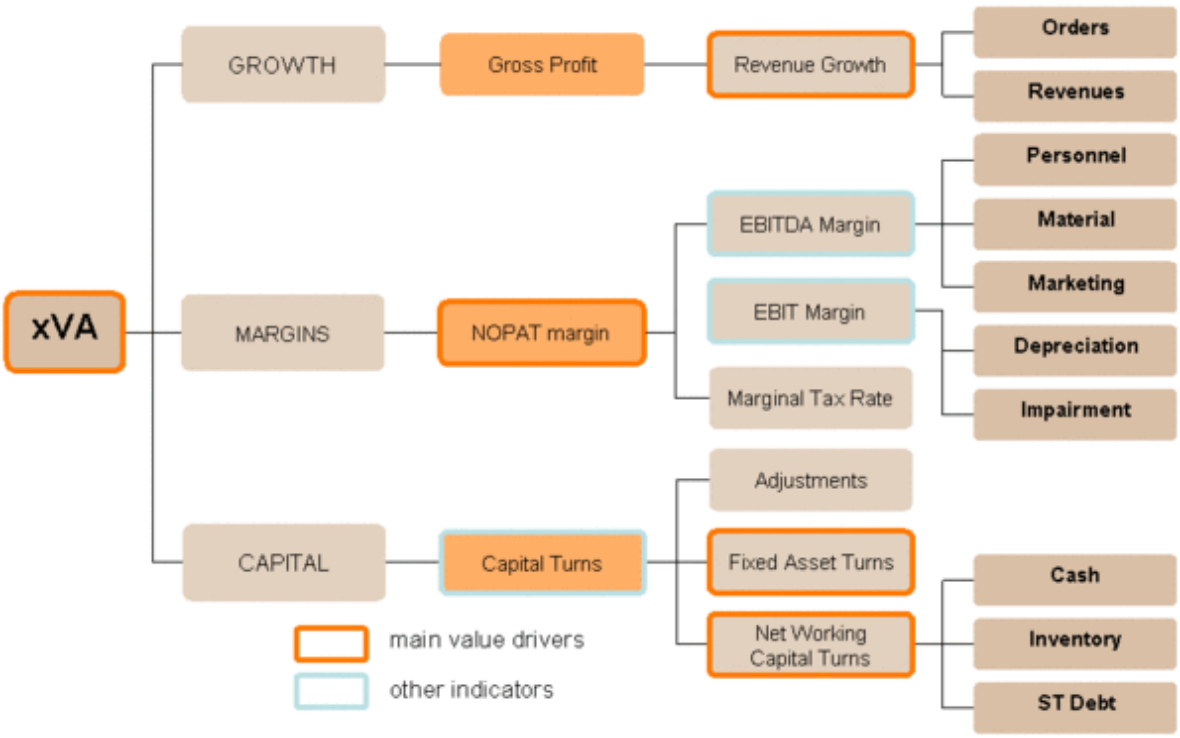

Figure 2.4: Value driver tree for non-financial companies
(Source: Adopted from Obermatt, 2010).

If financing is part of business operations, as in the case of banks and insurance companies, the value driver tree for financial institutions (Figure 2.5) is used.

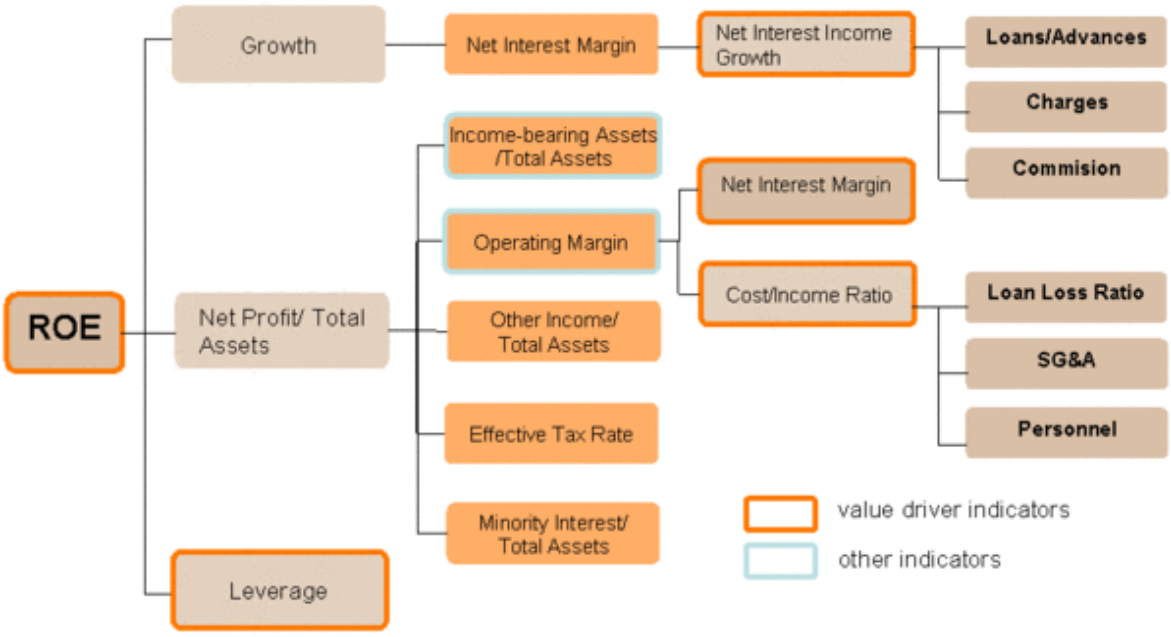

Figure 2.5: Value driver tree for financial companies
(Source: Adopted from Obermatt, 2010).

From the above diagrams it can clearly be seen that every company will have its own unique set of value drivers. Value drivers will differ from operating business to financial business. Operating businesses are companies delivering services or creating items/products. Mines or transport companies are examples of operating businesses. Financial businesses are companies in the financial company sector. Banks or asset managing organizations are examples thereof. Value drivers depend on each company's unique situation and that value drivers need to be broken down to operating level. It is just as important to remember that value drivers should not be considered in isolation, because many of these value drivers are somehow linked to each other, and focusing on one only, might have a negative effect on another one (Hall, 2002:20).

Stewart (1999:299) identifies six essential factors that collectively account for the intrinsic value of a company. Stewart differentiates between factors which are under the control of management and factors which are beyond the control of management.

Factors under control of management:

- Net operating profit after tax (NOPAT).
- The tax benefit of debt associated with management's target capital structure.
- The amount of new capital invested for growth in a normal year of the investment cycle.
- The after-tax rate of return expected from new capital investments.

Factors beyond management's control:

- Weighted cost of capital (WACC).
- The future period of time over which investors expect management will have attractive investment opportunities.

2.3 VALUE-BASED METRICS

Value-based metrics provide a performance measure and discipline for executing company strategy (Frigo, 2002:2). It must be noted that not one specific metric will fit all situations. Value-based metrics must be flexible to adapt to the purpose of the analysis. Throughout the late 1980's and 1990's a growing number of concerns were raised about traditional accounting measures (Starovic *et al.,* 2004:10). Criticisms about these measures were primarily apprehensive with the scope for subjectivity that even the most

comprehensive accounting standard allows. Rappaport (1986) and Stewart (1991) recognised these problems. As a result they turned to the concept of shareholder value and how this can be created and sustained. Starovic *et al.* (2004:10) state that this in turn has led to the development of a number of "value metrics" of which, for them, the most significant are:

- Shareholder value analysis (SVA).
- Economic profit (EP) also referred to as residual income (RI).
- Economic value added (EVA).
- Cash flow return on investment (CFROI).
- Total business returns (TBR).

Ryan and Trahan (1999:47 & 2007:113-114) agree with Starovic *et al.* by providing equivalent metrics. Listed below are the combined metrics which Ryan and Trahan as well as Starovic *at al.* prefer to use:

- Discounted cash flow (DCF).
- Cash flow return on investment (CFROI).
- Return on invested capital (ROIC).
- Residual income (RI) also referred to as economic profit (EP).
- Economic value added (EVA).

Although consulting companies popularised these metrics, many companies apply their own versions thereof. Each of the metrics Starovic *et al.* (2004:10) mention is advocated by a number of consultants and has been adopted by companies in the United Kingdom and elsewhere. It is argued that these metrics can be used for numerous purposes, including valuation, strategy, evaluation and monitoring of performance. There are significant differences between the different value metrics but in each case it is agreed that the primary objective of a company should be to maximise shareholder wealth (Starovic *et al.,* 2004:10). Therefore, each of the metrics attempts to measure value creation for shareholders. Selected metrics will be described next.

2.3.1 Shareholder value analysis (SVA)

The SVA approach was developed by Alfred Rappaport in the 1980's. It can be used to estimate the value of the shareholders' stake in a company or business unit, and can also be used as the basis for formulating and evaluating strategic decisions (Starovic *et*

al., 2004:10). The value of the operations of a business is determined by discounting expected future operating free cash flows at an appropriate cost of capital. In order to find shareholder value, the value of "marketable securities and other investments" must be added to, and the value of debt must be subtracted from, the business valuation. Free cash flow reflects the cash flow from the operations of a business for a period. This means it is done before taking into account any financing-related cash flows, such as those relating to share or debt issues, dividend and interest payments.

Technically, in order for the value of the business to be accurately determined, free cash flow for all future years should be estimated. In practice, however, a short-cut approach can be applied; hereby the future cash flows are divided into two time periods: those that occur during, and those that occur after, an explicit "planning horizon". This can be represented as follows (Starovic *et al.,* 2004:10):

- Value of Operations = PV (present value) of free cash flows during planning horizon + PV of free cash flows after planning horizon ("continuing value").

The operating free cash flows during an explicit planning period can be determined by estimating future values for each component, separately, on a year-by-year basis. The SVA value driver approach provides an alternative simplified method, which may give a sufficiently reliable approximation in many situations. Starovic *et al.* (2004:10) state that this simplified approach involves using the "seven value drivers" to estimate the value of the operations during the planning horizon, which is the number of years into the future that sales growth is forecast. The "seven value drivers" are:

- The percentage annual sales growth rate.
- Operating profit margin (before non-operating items such as interest payable and tax).
- Cash income tax rate (that excludes deferred tax).
- Incremental fixed capital investment rate.
- Investment in working capital rate.
- Planning horizon.
- Cost of capital.

In terms of the "Value of operations" formula as defined, the first five value drivers listed above can be used to calculate the free cash flow for each year throughout the planning horizon. These are then discounted at the company's cost of capital. For consistency

with the definition of cash flow used (which reflects total cash flows available to the total investment in the business), the appropriate discount rate to use is the weighted average cost of capital (WACC). The WACC weighs the returns of equity and debt investors according to the relative proportions of equity and debt invested in the company (Starovic *et al.,* 2004:10).

The second component per the definition of "Value of operations" of the operations of a business is the present value of operating free cash flows that arise beyond the planning horizon. This value is often referred to as the "continuing" or "terminal value". For most companies operating in competitive industries, it is unlikely that a business that is generating excess returns on capital will be able to sustain this for an extended period of time (Starovic *et al.,* 2004:11). An assumption is usually made that in the post-planning period, the business will earn, on average, its cost of capital. In other words, additional investment would neither create, nor destroy, value and so the effect of new investment beyond the planning horizon can be ignored. As a result, an assumption often made with SVA is that the cash flow arising in the final year of the planning period will continue to arise into the future, to infinity.

The formula used to calculate SVA is:

SVA = NOPAT – (Capital x WACC).

The first step in calculating SVA is to calculate NOPAT; the second step is to estimate capital employed; the third step is to estimate the appropriate WACC; the fourth step is to calculate the capital charge; and the fifth step is to calculate SVA (Department of Treasury and Finance, 1999:5).

2.3.1.1 Advantages of SVA

SVA can be used to evaluate alternative strategic decisions by comparing the pre- and post strategy value of the business. The simplified approach which emphasises the seven key value drivers, lends itself to the development of a "sensitivity analysis". (Sensitivity analysis involves assessing the effect of changes in assumptions on the value of a business or strategy. It can be a particularly useful way of identifying the critical variables that affect shareholder value). Entrepreneur (1999:1) gives a short summary of advantages:

- It provides a long-term financial view on which to base strategic decisions.
- It provides a universal approach that is not subject to the particular accounting policies that are adopted. It is therefore internationally applicable and can be used across sectors.
- It forces the organisation to focus on the future and its customers, in particular the value of future cash flows. Other more traditional measures are cost-based, bearing little relation to the economic income generated during a period.

2.3.1.2 Disadvantages of SVA

The major dilemma with SVA is that in using the technique, it will mean you have to predict the variables used in the analysis. Entrepreneur (1999:1) gives a short summary of disadvantages:

- Estimation of future cash flows, a key component of SVA, can be extremely difficult to compute accurately. This can lead to incorrect or misleading figures forming the basis for strategic decisions.
- Development and implementation of a system can be long and complex.
- Communication of the approach to managers can be difficult.
- Management of shareholder value requires more complete information than traditional measures.

2.3.2 Economic profit (EP)

Economic profit (EP) is usually referred under the name "residual income" (RI) and can be traced back to the work of economist Alfred Marshall (1890). Stern and Stewart refined this approach to produce economic value added (EVA). Ryan and Trahan (1999:47 & 2007:113-114) state that RI measures the excess earnings over a capital charge based on investment opportunities of similar risk. Starovic *et al.* (2004:11) describes EP as the surplus earned by a business in a period after the deduction of all expenses, including the cost of using investors' capital in the business. Advocates of the EP approach argue that net profit is misleading and that some companies that are apparently profitable, based on accounting profit, can be shown to be economically unprofitable using the EP measure.

Economic profit is the difference between the return on capital and the cost of capital and can be calculated in two ways, as shown below (Starovic *et al.,* 2004:11):

(i) EP = Invested capital x (return on capital – WACC).

(ii) EP = Operating profit after tax less capital charge.

Approach (i) demonstrates that EP represents the amount of capital invested in a business multiplied by the "performance spread", which represents the difference between the return achieved on the invested capital and the weighted average cost of capital. The second approach deducts a capital charge (calculated as invested capital x WACC) from operating profits after tax. Operating profits refer to the profits of a business before deducting non-operating items, such as interest receivable, investment income and interest payable.

Although EP appears to be a short term, single period measure, an important feature of this approach is that it has a direct link with long term value based on the free cash flow approach. In mathematical terms, long term value (the present value of expected future free cash flow) equals the sum of the present value of all expected future economic profits, plus the initial capital investment. As with the SVA approach, it is possible to identify a number of value-drivers that can be used to develop more detailed specific performance targets and indicators. There are three key factors that influence economic profit:

- The return on capital achieved.
- The cost of capital.
- The growth of new capital.

2.3.2.1 Advantages and disadvantages of EP

According to Starovic *et al.* (2004:12) EP can be used to measure and evaluate performance and to fulfil a more strategic role. At the business level, EP can be used to set the performance targets for the business, and providing that the balance sheet information exists, performance against these targets can be tracked via the established accounting system. The use of traditional accounting numbers, based on the same rules, conventions and policies that govern the production of published accounts is, however, a significant drawback of this approach. For example, the distorting effects of inflation and depreciation could well undermine the validity of the calculations.

2.3.3 Economic value added (EVA)

Finance journals annually publish the EVA for the Stern Stewart Performance 1000, citing EVA as "the critical driver of a company's stock performance". Successful corporations are increasingly turning to EVA to measure performance. General Electric, AT&T, Chrysler and Compaq all use EVA for financial analysis. Coca Cola's late CEO, Roberto Goizueta, acknowledged the value of EVA and declared that "you only get richer if you invest money at a higher rate than the cost of the money to you" (Farsio, Degel & Degner, 2000:115).

EVA was launched by Stern Stewart & Co. in 1989. EVA is defined by Stewart (1999:192) as the internal measure of operating performance that best reflects the success of companies in adding value to the shareholders' investment. In EVA companies, target setting is based on calculations, rather than negotiations. Target setting is calculated from the current level of EVA, taking into consideration any changes in the circumstances (Ikäheimo & Malmi, 2003:237). EVA and RI are closely related by their objective of ensuring that the total cost of resources consumed in the period, including the cost of capital, are included in any profit calculation. As a result of the focus on the cost of capital, the EVA measure is very useful for bringing balance sheet issues into profit and loss accounts and consequently raising their profile with managers (Mackay, 2004:16). EVA is expressed in actual monetary values and consequently can be a very meaningful management objective.

Hall and Grant (*in* Hall, 2002:2) found that the market value of a company correlates best with the internal performance measurement of economic value added (EVA), and therefore EVA is one of the best methods to express and quantify shareholder value creation. Thus it is recommended by numerous consultants and should be employed to the fullest. EVA becomes far more than just another way of adding and computing profit. Ehrbar (1998:6) describes EVA as the following:

- A simple but effective method for teaching business literacy to even the least sophisticated of workers.
- A method to truly align the interest of managers with those of shareholders and as a result, it makes managers think and act like shareholders.
- The corporate performance measure that is tied most directly to the creation of shareholder wealth.

- The only genuine continuous improvement metric, and more, EVA is always unambiguously better for shareholders.
- The framework underlying a comprehensive new system of corporate financial management that guides annual operating budgets, capital budgeting, strategic planning, and decisions regarding acquisitions and divestitures.
- A method for companies to communicate their goals and achievements to investors, and a method for investors to identify companies with superior performance prospects.
- An internal system of corporate governance that motivates all managers and employees to work cooperatively and enthusiastically to achieve the very best performance possible.

2.3.3.1 Calculating EVA

Various methods of calculating EVA exist. The method used depends on the company's management decision. Methods used to calculate EVA will be described in this section.

Calculating EVA according to Correia *et al.* (2008:628) is:

- EVA = net profit after tax (NOPAT) – [capital employed x weighted average cost of capital (WACC)]

Capital employed is calculated by deducting liabilities from total cost.

Ehrbar (1998:3) calculates EVA by the following formula:

- EVA = NOPAT – (percentage cost of capital x total capital)

EVA is calculated with refined versions of EP by Starovic *et al.* (2004:12):

- EVA = adjusted invested capital x (adjusted return on capital – WACC);
- EVA = adjusted operating profits after tax less capital charge;
- EVA = adjusted operating profits after tax less (adjusted invested capital x WACC)

Generally speaking, Stern Stewart suggests that the basic EP calculation is undermined by three distorting factors (Starovic *et al.,* 2004:12). These are the effect of:

- Non-cash, accruals-based bookkeeping entries, which tend to conceal the true "cash" profitability of a business.

- The fundamental accounting concept of prudence, which tends to lead to a systematic conservative bias affecting the relevance of reported accounting numbers.
- "Successful efforts accounting" whereby companies write off costs associated with unsuccessful investments, which tends to understate the "true capital" of a business, and also potentially subjects the profit and loss account to one-off, non-recurring gains or losses.

The EVA formula according to Brigham and Ehrhard (2005:110) is:

- EVA = earnings before interest and tax (EBIT) – (total net operating capital) (WACC)

According to Martin and Petty (2000:88) EVA is calculated as follows:

- EVA = NOPAT – (firm's weighted average cost of capital x CAPITAL)

CAPITAL = Total cash invested in the firm over its life, net of depreciation.

Alternative methods of calculating EVA is by calculating it in terms of ROIC. The two calculations are as follows:

Brigham and Ehrhardt's (2005:110):

- EVA = (operating capital)(ROIC – WACC)

Where:

Operating capital = the sum of net operating working capital and operating long-term assets (the total amount of capital needed to run the business).

ROIC = the ratio of NOPAT to total operating capital.

AND

Martin and Petty (2000:88):

- EVA = (r-k) x CAPITAL

Where:

r = firm's return on capital (NOPAT/CAPITAL); and

k = firm's weighted average cost of capital.

2.3.3.2 Descriptions

Weighted average cost of capital

$WACC = w_d r_d(1 - T) + w_{ps} r_{ps} + w_{ce} r_s$

w_d = weight of debt

r_d = after tax cost of debt

w_{ps} = weight of preferred equity

r_{ps} = cost of preferred equity

w_{ce} = weight of common equity

r_s = cost of common equity

Capital

Capital can be divided into categories - financial capital such as cash and tangible operating assets like machinery, factories and equipment. Capital is the sum of net working capital, net property and equipment, goodwill and other assets (Peterson, 2000:79). Net operating working capital (NOWC) is defined as operating current assets (cash, accounts receivable and inventories) less operating current liabilities (accounts payable and accruals) (Brigham & Ehrhardt, 2005:104). Total net operating capital can also be calculated by adding up the funds provided by investors, such as notes payable, long-term bonds, preferred stock, and common stock (Brigham & Ehrhardt, 2005:104).

Net operating profit after tax (NOPAT)

NOPAT is a company's potential cash earnings if its capitalization were unleveraged (if it had no debt).

Calculated: NOPAT = operating Income x (1 - tax rate)

NOPAT gives a more accurate look at operating efficiency for leveraged companies. It does not include the tax savings many companies get because they have existing debt (Investopedia, 2010).

Return on invested capital (ROIC)

ROIC is a calculation used to assess a company's efficiency at allocating the capital under its control to profitable investments. The return on invested capital measure gives a sense of how well a company is using its money to generate returns. Comparing a

company's return on capital (ROIC) with its cost of capital (WACC) reveals whether invested capital was used effectively. Total capital includes long-term debt and common and preferred shares. Because some companies receive income from other sources or have other conflicting items in their net income, net operating profit after tax (NOPAT) may be used instead. Calculated as follows:

$$\text{ROIC} = \frac{\text{Net Income} - \text{Dividends}}{\text{Total Capital}}$$

When calculating the rate of return on capital from a financing perspective, Stewart (1999:187) suggests the following:

- Add all interest-bearing debt (plus the present value of non-capitalised leases) to common equity, and the interest expense on the debt to the bottom-line accounting profit. This is done to remove the effect of gearing up the capital structure with debt and the result is the earnings that would have been reported if the company was 100% equity funded. The tax benefit from debt is therefore properly taken into account.
- Other financing distortions must be eliminated by adding the equity provided by preferred stockholders and minority investors to capital and by adding the cost of these sources back into NOPAT. NOPAT is therefore now totally unaffected by the capital structure.
- Accounting distortions are eliminated by adding equity equivalent reserves to capital, and the periodic charge in such reserves to NOPAT. Equity equivalents are added back to capital in order to convert from accrual accounting to cash accounting.

2.3.3.3 Advantages of EVA

Economic value added (2010:6) lists advantages of using EVA:

- EVA is closely related to NPV. It is closest in spirit to corporate finance theory that argues that the value of the firm will increase if it takes on positive NPV projects.
- It avoids the problems associated with approaches that focus on percentage spreads - between ROE and cost of equity, and ROC and cost of capital. These

approaches may lead firms with high ROE and ROC to turn away good projects to avoid lowering their percentage spreads.

- It makes top managers responsible for a measure that they have more control over - the return on capital and the cost of capital are affected by their decisions - rather than one that they feel they cannot control as well - the market price per share.
- It is influenced by all of the decisions that managers have to make within a firm - the investment decisions and dividend decisions affect the return on capital (the dividend decisions affects it indirectly through the cash balance) and the financing decision affects the cost of capital.

According to Jalbert & Landry (2003:9) benefits are:

- Explicitly considers the cost of capital.
- Allows projects to be viewed independently.
- Capitalizes expenses that have multi-period benefits.
- Provides detail of corporate performance beyond that obtained from market determined measures.

Dasgupta (2002:39) lists the following benefits of EVA as a VBM metric:

- Improvement of capital efficiency.
- Greater focus on tax optimization.
- Greater focus on optimal capital structure.
- Improved strategic and scenario planning.
- More robust acquisition analysis tools.

2.3.3.4 Disadvantages of EVA

According to Starovic *et al.* (2004:13) EVA can be time-consuming and a costly exercise involving some rather arbitrary judgements.

Jalbert & Landry (2003:9) suggests disadvantages to be:

- Computations are difficult.
- It is difficult to allocate EVA among divisions.
- It is market determined.

EVA disadvantages identified by Brewer, Chandra and Hock (1999:7) are:

- Size difference. A larger plant or division will tend to have a higher EVA relative to its smaller counterparts.
- Financial orientation. Managers can manipulate EVA in various ways, three of which are the following:
    - Revenue recognition can be manipulated by choosing which customer orders to fill and which to delay.
    - Discretionary expenditure can be terminated to boost EVA.
    - Completely depreciated assets may not be replaced because it lowers the asset base and ensures that no depreciation is charged, thereby increasing the EVA.
- Short term orientation. The generation of immediate results is overemphasised and therefore creates a disincentive for managers to invest in innovative product or process technologies, because the benefits will only be realised in the medium or longer term.
- Results orientation. EVA does not help in offering solutions to the non-accounting business managers who are responsible for continuously improving the value delivered to customers.

2.3.4 Cash flow return on investment (CFROI)

CFROI, originally developed by HOLT value associates, is an economic profit (cash flow) based corporate performance/valuation framework on economic profit basis, mainly used by portfolio managers and corporations (VBM, 2010). In essence, CFROI is a "real" (i.e. adjusted for the effect of inflation) rate of return measure, which identifies the relationship between the cash generated by a business relative to the cash invested in it. Starovic *et al.* (2004:13) argue that CFROI provides an accurate measure of the economic performance of a business, free from potential accounting distortions relating to issues such as inflation and variations in asset ages. As well as providing a "superior" measure of current performance, it is also promoted as "the performance measure which best predicts future cash generation".

2.3.4.1 Calculating CFROI

According to Investopedia (2010) CFROI is a valuation model that assumes the stock market sets prices based on cash flow, not on corporate performance and earnings, and are calculated as such:

$$\text{CFROI} = \frac{\text{Cash Flow}}{\text{Market value of capital employed}}$$

According to Starovic *et al.* (2004:13) the calculation of CFROI requires three important stages:

- First, accounting profit is converted into "real cash flow" for the period. This involves adjusting for non-cash profit and loss account items and non-operating items.
- Secondly, the balance sheet value of the capital invested in the business is converted into an inflation-adjusted measure of investment in the business, described as "gross assets at current cost". Gross assets include off-balance sheet assets, but exclude goodwill. The inflation adjustment returns assets to their full historical cost. This is then adjusted for the effects of general price inflation.
- Finally, the annual cash performance is converted into a measure of economic performance over the average life of the firm's assets, using the principles of IRR. This requires the average life of the firm's assets to be known and, in addition, the value of non-depreciating assets (such as land and working capital, which are assumed to be released at the end of the firm's life) to be estimated. Once this information has been obtained, an IRR calculation is performed to determine the discount rate ("r") that solves the following equation.

$$\text{Gross operating assets (current prices)} = \frac{CF1}{(1+r)} + \frac{CF2}{(1+r)^2} + \ldots + \frac{CFt}{(1+r)^a} + \frac{NDA}{(1+r)^a}$$

Where: CFn represents the real cash flow in each year for the average life of the firm's assets. NDA represents non-depreciating assets. With this approach, CFROI measures the cash profitability of a business for a specific year, and represents the average projected rate of return from all of a business' existing projects at a particular point in time. It can be calculated separately for each year using the above approach, enabling the trend in CFROI performance to be analysed. Furthermore, CFROI can be compared to the company's "real" cost of capital to identify the CFROI performance spread.

2.3.4.2 Advantages of CFROI

Erasmus & Lambrechts (2006) suggests advantages they experienced in the field:

- CFROI may be applied for various purposes and is not restricted to a single use or type of enterprise. It is also conceptually simple and not restricted to GAAP.
- CFROI's results are easily comparable between different enterprises, business units and product lines.
- CFROI is an internal rate of return instead of being a measure of economic profit. As a rate of return, it provides a consistent basis from which to evaluate enterprises regardless of their size, which a dollar-based measure of economic profit cannot do.

Starovic *et al.* (2004:14) claim that CFROI is a superior measure of performance that provides the basis for more accurate business valuations. The key justification for using this approach is the argument that of each of the metrics available, it most accurately reflects the way in which the stock market judges a company's performance. One of the key advantages of CFROI as a measure of performance is that, unlike the EP/EVA, models, it is neither distorted by the effect of inflation nor depreciation.

2.3.4.3 Disadvantages of CFROI

Erasmus & Lambrechts (2006) suggests disadvantages they experienced in the field:

- CFROI has limited use with start-up operations, where the portfolio of projects as a whole is still being penalised by very substantial expenses and limited revenue, for instance in the case of development stage firms.

- Another possible shortcoming of the CFROI approach is the implicit assumption that cash flow can be re-invested at the calculated CFROI rate (as in the case of the irr method).

According to Starovic *et al.* (2004:14) the calculations required are time-consuming and costly to apply. Determining the appropriate inflation adjustment to apply to fixed assets, for example, requires an estimate to be made of the average age of assets and an appropriate inflation factor. Furthermore, the time period referred to as the "normal life of assets" for the business, which represents the time period over which CFROI is calculated, is very subjective.

2.3.5 Total business returns (TBR)

Technical Change Associates (2010) describes TBR as an assessment of financial performance based on annual operating margin, stock appreciation, dividends paid to shareholders, and other financial measures. More simply TBR is the internal equivalent of the external total shareholder returns (TSR) measure, which considers capital gains and dividends received by shareholders. The TBR approach is claimed to overcome the principal weakness with any short term performance measure (including cash flow, EP/EVA and CFROI), as it incorporates the long term effect on value of the business decisions and actions taken in a particular period. This is because TBR combines the cash flow performance of a business with the change in value that occurred during the period. TBR represents an internal rate of return measure that equates the beginning value of a business with net free cash flows arising in the period, plus the value of the business at the end of the period (Starovic *et al.,* 2004:14). What this means is that the accuracy of TBR depends on the accuracy of the valuation of the business at the start and the end of the relevant period.

TBR is often used in conjunction with CFROI. In such case valuations are based on the application of the CFROI valuation methodology. Although TBR is often used alongside CFROI, there is no reason why TBR cannot be used with other value metrics. (In fact, Unilever has used TBR as a key strategic measure with an EP-type measure as the key measure for monitoring short term performance.)

2.3.5.1 Calculating TBR

According to VBM (2010), TBR is calculated as follows:

	Terminal value end of period
minus	gross cash investment beginning of period
plus	gross cash flows in the in– between period
equals	total business returns (TBR).

2.3.5.2 Advantages of TBR

The key justification for TBR is that, by incorporating the effect of changes in value as well as "delivered" performance in a period, it represents the closest measure of the true economic performance of a business (Starovic *et al.,* 2004:14).

2.3.5.3 Disadvantages of TBR

The main problem with TBR relates to the difficulty in accurately measuring opening and closing business valuations for a particular period. These can be based on managers' forecasts, which are inevitably subjective (Starovic *et al.,* 2004:14).

2.4 SHARE PRICE MOVEMENT

The advent of the Internet and the ability to trade securities via the Internet made investment information and services available and affordable to the general public (Farsio *et al.,* 2000:117). According to Farsio *et al.* (2000:118), investors have increasingly adopted the practice of investing in companies specifically for the capital appreciation possibilities, focusing on projected growth rates while ignoring poor performance indicators such as negative earnings.

Why does the share price of a company move up or down from day to day? What does the share price of common stock actually represent other than a number on the financial page of the newspaper?

Fundamentally, classic finance theory tells us that the price of a company's common stock is the present value of all of its future cash flows (Coleman, 2009:1). The share price is really the worth of all the company's dividend payments to its individual stock holders in today's Rand values. For example: ABSA bank's share price price for a specific month may be trading at R129.75 (06/02/2010), dropping to R127.00 (06/03/2010) a month later. Yet, this does not mean that ABSA bank had such a horrible

month that it could lose 2% of the company's value. The price of common stock is not rational in the short term. That is the essence of what drives short term stock price movement, irrational behaviour on the part of investors. The human factor makes the stock market volatile.

If one is to consider all investors as rational, then each investor will value the stock rationally and invest in an expected pattern, buying stock and raising the price offered based on information about the company in question's financial soundness and ability to turn a profit (Coleman, 2009:1-2). To value a company's share price, a longer term fundamental analysis should be done. If the company has good fundamental finances and principles, then its stock price will continue to do well over the long run (six months or more) (Coleman, 2009:1-2). Financial fundamentals such as revenue, profit growth, dividends and cash flows, should be analyzed.

Rappaport and Mauboussin (2001:9) list three pervasive misconceptions in the investment community that lead investors to chase the wrong expectations:

- The market is short term.
- Earnings per share (EPS) dictate value.
- Price-earnings multiplied determine value.

The reality of the misconceptions are:

- The market takes the long view.
- Earnings tell very little about value.
- Price-earnings are a function of value.

The London Stock Exchange (2010) grouped factors that influence stock prices into six segments:

(i) The economy: The health of the global economy has a primary influence on share prices and the stock market will anticipate moves in the economy by around six to nine months.

(ii) Company news: News put out by companies can influence share prices.

(iii) Analysts' reports: Independent analysts' reports can influence share prices.

(iv) Press recommendations: Sentiments from journalists can either have a positive or a negative effect on share prices.

(v) Sentiment: Investor sentiment is almost impossible to predict and can be influenced by a wide variety of factors.

(vi) Technical influences: Share prices can be influenced by a variety of technical reasons that has nothing to do with the actual outlook for an individual company or the market itself. A common technical influence is profit taking after a strong rally. This means investors tend to sell stock after a high percentage gain in the stock invested.

Kleinman (*in* Ikäheimo & Malmi, 2003:236) focused on EVA adopters and found their stock market performance to be significantly better than that of their industry competitors. These research settings implicitly assume that VBM or EVA is applied similarly in each organisation.

Ferguson, Rentzler and Yu (2005:111) found that there was insufficient evidence to conclude that poor stock performance leads a firm to adopt EVA or that adopting EVA improves stock performance. Ferguson *et al.* (2005:111) concluded that firms who adopted EVA appeared to have above-average profitability relative to peers both before and after adopting EVA. What Ferguson *et al.* also found is that EVA is one of the poorest measures available to indicate stock performance. There is an overwhelming body of established academic research that proves that accounting measures of performance is only coincidentally related to share price and are not the primary determinants. The academic evidence proves that cash, adjusted for time and risk, which investors can expect to get back over the life of the business, truly determines the share price (Stewart, 1999:2).

2.5 SUMMARY

From as early as 1776 investors required a return on their investments. In recent years creating shareholder value or creating return on investment became much more of a daily ritual and routine. People use their savings to invest in companies by buying shares from the stock market. They invest in portfolios and pension funds which consist of shares. Value-based management strategies and metrics are used to evaluate companies and help to maximise shareholder value. In companies such as Lloyds TSB and Cadbury Schweppes, VBM programmes have been credited with delivering exceptional value for shareholders. Well-implemented VBM programmes typically deliver a 5-15% increase in bottom-line results (Benson, 2004:19). Although it can help

maximise value, VBM is no simple magic potion for superior performance. A number of metrics recently developed must be correctly incorporated to assist with implementing VBM, maximising shareholder value or creating return on investment. Metrics such as EVA, EP, SVA, CFROI and TBR were developed and are currently used in companies across the world.

VBM places the interests of owners of companies back in the centre of decision-making. This in turn means those investors can rely on more than just the instruments of corporate governance to protect them from the possible conflicts of interest arising from the split between ownership and management. Owners of companies should be educated in the principles of VBM and the advantages and disadvantages of using the management program.

CHAPTER 3
EMPIRICAL STUDY

3.1 INTRODUCTION

Value-based management became popular in the mid-1980s when Rappaport published his seminal text, *Creating shareholder value: the new standard for business performance* (1986). Companies such as Boots, Lloyds TSB and Cadbury Schweppes were soon making explicit public commitments to increasing value for their shareholders (Starovic *et al.*, 2004:4). Copeland, Koller and Murrin (2000:3) see value-based management as an approach to management whereby the company's overall aspirations, analytical techniques and management processes are all aligned to help the company maximise its value by focusing management decision making on the key drivers of value.

Throughout the late 1980s and 1990s there have been a growing number of concerns raised about traditional accounting measures. These criticisms are primarily concerned with the scope for subjectivity that even the most comprehensive accounting standards allow. A number of consultants, such as Rappaport and Stewart, recognised these problems. As a result, they turned to the concept of shareholder value and how this can be created and sustained. This has, in turn, led to the development of a number of "value metrics". The most significant of these metrics are:

- Shareholder value analysis (SVA).
- Economic value added (EVA).
- Cash flow return on investment (CFROI).
- Economic profit (EP).

The main goal of this study is to investigate and determine whether investors can use value metrics as an indicator for share price movement of South African banks listed on the Johannesburg Securities Exchange (JSE). The South African banks included for the purpose of this analysis are Absa, Nedbank, Standard Bank, First National Bank and Capitec Bank.

3.2 RESEARCH METHODOLOGY

In order to determine whether investors and managers of South African banks can use VBM and its metrics as an indicator of share price movement, a quantitative approach was followed. The quantitative analysis was done by making use of historical financial data obtained from McGregor BFA for the years 1999 to 2009. The data was used to determine whether a company's VBM does have an effect on the company's share price.

3.2.1 Data collection

McGregor BFA was used to gather information about banking institutions listed on the JSE. McGregor BFA supplies real-time and historical fundamental information on South African listed companies, local and international economic data as well as international financial indicators. Currency exchange data can also be retrieved from McGregor BFA. McGregor BFA also provides standardised financial information, which was implemented in this study.

Various income statement, balance sheet and cash flow statement items of the identified companies were selected as independent variables. In addition to several financial indicators, SVA, EP, EVA and CFROI were selected as independent variables, to determine whether these value creation metrics have an influence on the share price of the selected companies. The dependent variables selected were the average price per share for the last month before financial year end (APS), and the year-end price per share (YPS) of the companies. Data for APS was collected for the period 1999 to 2009 and for YPS from 1999 to 2009.

3.3 EMPIRICAL FRAMEWORK

For the purpose of this analysis, the statistical analysis software, STATA® was employed. The data obtained was presented as a panel data set with both cross-sectional and time variables. Initially the respective banks were isolated and five individual multiple linear regressions were run. This was done in order to determine whether the results of the specified metrics have an impact on the respective share prices of the individual banks.

Subsequently a pooled panel data model was run to determine whether the combined effect of the banks over time could lead to different results.

Both types of empirical models included in this set are based on the assumption of Ordinary Least Squares (OLS). Where the data have not been presented in the form of percentages, variables were transformed into log form in order to simplify the interpretation of results.

3.3.1 Model specifications

Wisniewski (2002:347) explains that multiple linear regressions are used to explain a dependent variable by means of some explanatory variables. In order to use such regressions, a multiple regression model must be used. Multiple regression models are principally complex in both their structure and the underpinning statistical assumptions of OLS.

The final model (i.e. pooled model) follows the same specification, however all five the listed banks are included in the regression data.

The different multiple regression models are specified as:

(i) $lasp = \beta_0 + \beta_1 lgoa + \beta_2 lp/e + \beta_3 eva + \beta_4 lnopat + \beta_5 cfroi + \beta_6 sva + \beta_7 ep + u$

(ii) $lysp = \beta_0 + \beta_1 lgoa + \beta_2 lp/e + \beta_3 eva + \beta_4 lnopat + \beta_5 cfroi + \beta_6 sva + \beta_7 ep + u$

Where:

$lasp$ is the log of the average share price;

$lysp$ is the log of the year end share price;

β_0 is the intercept;

β_1 is the parameter associated with the log of group operating assets;

β_2 is the parameter associated with the log of price earnings per share;

β_3 is the parameter associated with the economic value added;

β_4 is the parameter associated with the log of net operating profit;

β_5 is the parameter associated with the log of cash flow return on investments;

β_6 is the parameter associated with the log of shareholder value added;

β_7 is the parameter associated with the log of economic profits; and

u is the error term, the difference between each actual dependent value and the dependent value predicted by the regression model.

There are several key factors and assumptions behind the multiple regression model (Wisniewski, 2002:356) which were considered during the analysis:

(i) In a linear regression, an outlier is an observation with a large residual. It is an observation with a dependent variable value that is unusual given its values in terms of the independent variables. Detecting outliers is not one of the OLS assumptions, however it is important to consider as they could significantly influence the output of a regression and could be an indication of sample irregularities, entry problems or a problem of another sort.

(ii) The residuals of the model are normally distributed. This was tested for by running a Shapiro-Wilk test for normality.

(iii) Regression errors must have a constant variance, otherwise known as homoscedasticity. For this purpose a Breusch-Pagan/Cook-Weisberg test for heteroscedasticity (the event where errors do not have a constant variance) is performed.

(iv) The independent variables are independent of each other. When independent variables are not independent of each other, multi-collinearity exists. To test for multi-collinearity, a correlation matrix can be calculated between all the independent variables being used in the model. The correlation matrix contains all the correlation coefficients of the independent variables. Another way to test for multi-collinearity is to calculate the variance inflation factor for the independent variables in the model.

(v) A linear relationship exists between the dependent and independent variables. At an early stage of the process, scatter plots, presenting the augmented component-plus-residual are produced to determine whether there is a linear relationship between dependent and independent variables.

(vi) The regression errors are independent of each other. This assumption implies that each error is independent of the errors before it and the errors following it. If the errors are interdependent, then autocorrelation exists, where the errors are strongly correlated with each other. The Durbin-Watson test was used to determine whether autocorrelation exists.

Important to note is that the models are expected to have a possible endogeneity problem, this is the event where a loop of causality between the dependent and independent variables of the models can be found. This causality would result in biased

estimation parameters, and could be controlled for in future research by adding instrumental variables in the regressions.

3.3.2 Empirical results

3.3.2.1 Individual regressions

As the regressions were run separately for the different listed banks, a problem occurred with the regression for Capitec. Subsequently the years 1999 to 2001 were dropped from the data set of Capitec, as the bank was only listed on the JSE post-2002. This did however not solve the problem as all the post-estimation diagnostic tests were returned with warnings that the observations are problematic.

Testing for outliers

Outliers were found among the observations, by predicting the studentised residuals. A studentised residual value higher than the absolute value of two is indicative of an outlier and attention should be paid to determine that it is not due to a collection error. It should then be decided whether it makes sense to exclude or include the observations. These values can be seen below in Table 3.1; the highlighted values might be problematic.

Upon careful consideration it was decided not to exclude these observations, as reasonable explanations were found, and it was determined that the exclusion of these outliers might further harm the reliability of the output.

Table 3.1: Five highest and lowest studentised residual values for individual banks

ABSA	NEDBANK	FNB	STANDARD BANK
residual log average share price	**residual log average share price**	**residual log average share price**	**residual log average share price**
HIGH	**HIGH**	**HIGH**	**HIGH**
-2.640958	-4.287593	-13.72046	-3.198461
-1.549896	-1.429456	-1.705955	-1.05634
-0.8053177	-1.294893	-1.417921	-0.9567689
-0.4378271	-1.054657	-0.7858886	-0.673861
-0.3434323	-0.2607608	-0.2506943	0.1761388
0.0385932	-0.0586719	-0.096893	0.3105254
0.05079	-0.0135657	0.3120085	0.5391123
0.9160313	0.1102133	1.124579	0.698889
1.317606	0.2366826	1.14779	0.8491978
1.446026	1.679887	1.751279	0.9614164
residual log average share price	**residual log average share price**	**residual log average share price**	**residual log average share price**
LOW	**LOW**	**LOW**	**LOW**
-1.549896	-1.429456	-1.705955	-1.05634
-0.8053177	-1.294893	-1.417921	-0.9567689
-0.4378271	-1.054657	-0.7858886	-0.673861
-0.3434323	-0.2607608	-0.2506943	0.1761388
0.0385932	-0.0586719	-0.096893	0.3105254
0.05079	-0.0135657	0.3120085	0.5391123
0.9160313	0.1102133	1.124579	0.698889
1.317606	0.2366826	1.14779	0.8491978
1.446026	1.679887	1.751279	0.9614164
1.543511	18.53127	2.186843	14.35221
residual log year end share price	**residual log year end share price**	**residual log year end share price**	**residual log year end share price**
HIGH	**HIGH**	**HIGH**	**HIGH**
-4.073277	-7.262046	-3.272288	-69.96582
-1.41278	-5.119497	-2.117296	-2.441563
-1.254341	-1.089461	-1.590014	-1.399854
-0.916906	-0.4463441	-0.7622517	-0.0612623
-0.3625614	-0.282447	-0.5886058	-0.0211148
-0.2265583	-0.2131986	0.1272696	0.0405733
0.3809674	-0.0744287	0.3366699	0.2893399
0.4815439	0.1690966	0.9508842	0.3438959
0.9880888	0.2173526	0.9700434	2.046872
1.11352	1.330311	1.175014	2.231796
residual log year end share price	**residual log year end share price**	**residual log year end share price**	**residual log year end share price**
LOW	**LOW**	**LOW**	**LOW**
-1.41278	-5.119497	-2.117296	-2.441563
-1.254341	-1.089461	-1.590014	-1.399854
-0.916906	-0.4463441	-0.7622517	-0.0612623
-0.3625614	-0.282447	-0.5886058	-0.0211148
-0.2265583	-0.2131986	0.1272696	0.0405733
0.3809674	-0.0744287	0.3366699	0.2893399
0.4815439	0.1690966	0.9508842	0.3438959
0.9880888	0.2173526	0.9700434	2.046872
1.11352	1.330311	1.175014	2.231796
1.1736	5.783132	5.10349	2.417209

Testing for the normality of residuals

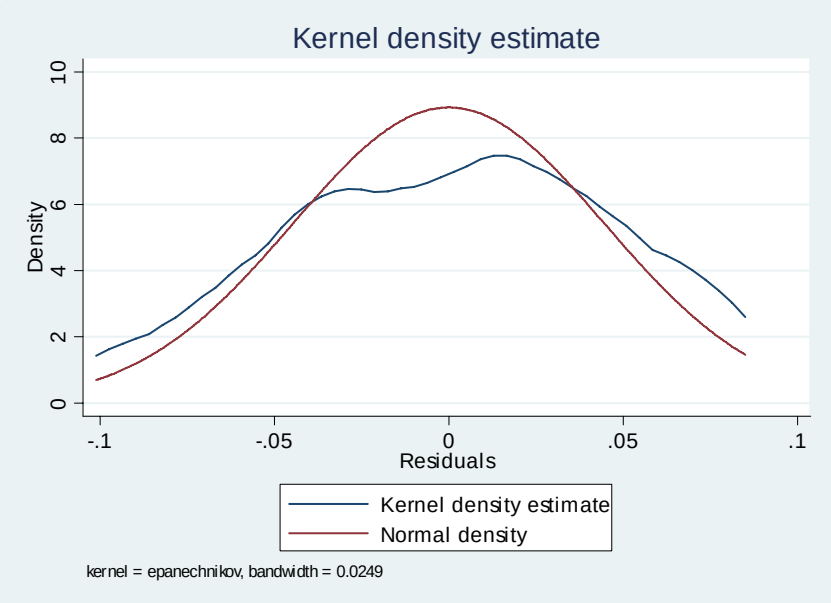

Figure 3.1: ABSA: Kernel density estimate - Log average share price

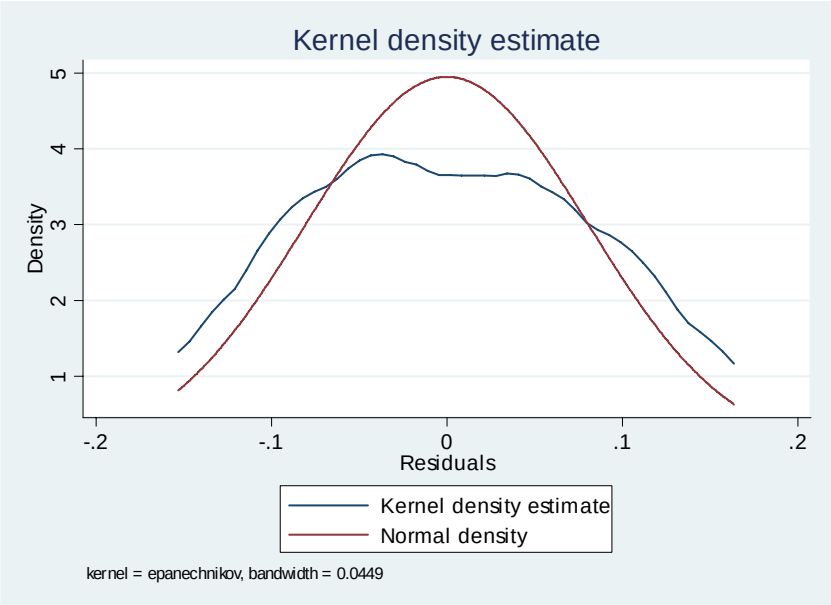

Figure 3.2: ABSA: Kernel density estimate - Log year end share price

The above graphs in Figure 3.1 and Figure 3.2 are representative of the respective normal distribution of the errors when the log of the average share price and the log of the year end share price are modelled for Absa bank.

The Shapiro-Wilk test indicated that both regressions with dependent variables, the log of APS and the log of YPS have residuals that are normally distributed. This test can be run as a test for the normality of residuals for samples with more than 7 observations and less than 2000.

Considering the $p - value = 0.13285 \geq 0.05$, the conclusion could be drawn that the null hypothesis of normally distributed errors could not be rejected. This was in fact the case for all banks under consideration, with the exception of the regression run for Nedbank, with dependent variable log of average share price.

In Table 3.2, the Shapiro-Wilk represents the ratio of the best estimator of the variance to the usual corrected sum of squares estimator of the variance (Shapiro and Wilk, 1965). The statistic is always positive and less than or equal to one, where a value close to one indicates normality. The Z-value is a test statistic value, for the null hypothesis of an approximated normal distribution. The central limit theorem states that many test statistics are approximately normally distributed for large samples. The v-value is derived from the covariance matrix; however, the W, V and Z values are not used for the purposes of this analysis.

This conclusion could be drawn, after a hypothesis test with a null hypothesis of normally distributed errors could not be rejected with the calculated test statistic. This was in fact the case for all banks under consideration, with the exception of the regression run for Nedbank, with dependent variable log of year end share price. The Shapiro Wilk test for Nedbank is shown in Table 3.2 below.

Table 3.2: Shapiro-Wilk test for normal data

Variable	Observations	W	V	z	Probability > z
Residual log year end share price	11	0.88841	1.807	1.113	0.13285
H0: Data normally distributed					

Testing for heteroscedasticity

No constant variance in the distribution of the error terms (Wooldridge, 2009:264).

The graphs below in Figure 3.3 and Figure 3.4 show plots of the residual versus the fitted (predicted) values of the two respective models for Absa. The assumption of OLS regressions is that of homogeneity (constant variance) of the residuals. If the model is well fitted, there should be no pattern to the residuals plotted against the predicted values, as can be seen in the graphical representations below.

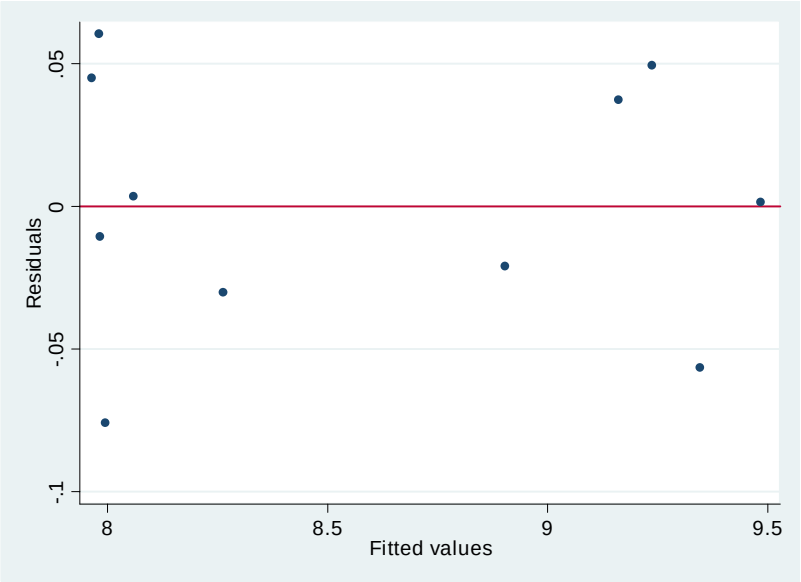

Figure 3.3: ABSA: Residual versus fitted values - Log average share price

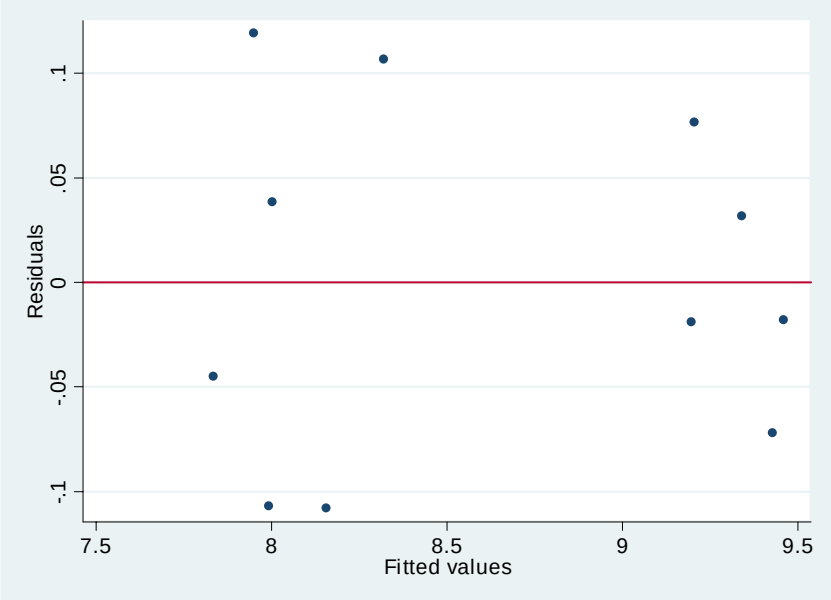

Figure 3.4: ABSA: Residual versus fitted values - Log year end share price

For the non-graphical method of testing for heteroscedasticity, the Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity was employed. In the case of Absa, Nedbank, First National Bank and Standard Bank, the p-value of this test was well above 0.05, which resulted in the null hypothesis of constant variance not being rejected. As such it was concluded that the respective individual regressions did not suffer from heteroscedasticity. The test results for Nedbank with dependent variable log of average share price are shown below in Table 3.3.

Table 3.3: Breusch-Pagan/Cook-Weisberg test for heteroscedasticity

Ho: Constant variance
Variables: fitted values of log average share price
$chi^2(1)$ = 0.00
Probability > chi^2 = 0.9885

Testing for multi-collinearity

For the purpose of testing for multi-collinearity, the respective variance inflation factors (VIF) of the independent variables were calculated. A VIF equal to ten or higher is a definite cause of concern, which is the case in all regressions.

Table 3.4: Variance inflation factors for individual banks

ABSA		CAPITEC		NEDBANK		FNB		STANDARD BANK	
Variable	VIF	**Variable**	VIF	**Variable**	VIF	**Variable**	VIF	**Variable**	VIF
SVA	144.38	**SVA**	137354.8	**LNOPAT**	175.09	**SVA**	221.16	**SVA**	55.2
LNOPAT	96.26	**LNOPAT**	47404.07	**SVA**	172.26	**LNOPAT**	152.58	**EVA**	20.2
EVA	41.58	**EVA**	38359.11	**CFROI**	64.77	**EP**	17.64	**EP**	19.02
LGOA	24.6	**LP/E**	15592.42	**LP/E**	31.85	**EVA**	12.82	**LGOA**	12.93
EP	6.36	**CFROI**	5555.9	**EVA**	18.05	**LGOA**	11.17	**LNOPAT**	12.81
CFROI	3.24	**LGOA**	3255.09	**EP**	11.34	**CFROI**	3.06	**CFROI**	3.22
LP/E	1.88	**EP**	1393.66	**LGOA**	10.51	**LP/E**	2.43	**LP/E**	1.42
Mean VIF	45.47	**Mean VIF**	35559.29	**Mean VIF**	69.12	**Mean VIF**	60.12	**Mean VIF**	17.83

In the case of Absa, the only variables with VIFs lower than the value ten are economic profit (EP), price earnings per share (LP/E) and the cash flow return on investments (CFROI). Capitec displays exceptionally high VIFs for all variables, indicating a serious problem of multi-collinearity. Nedbank could consider the variable group operating assets (LGOA) which is just over the value ten. First National Bank as well as Standard Bank has lower VIFs for the variables price earnings per share and the cash flow return on investments, indicating that the variables do not suffer from collinearity problems. The VIFs for the banks are shown in Table 3.4, where the values indicating a problem of collinearity have been highlighted.

One can also consider the correlation matrices of the specified variables to check for multi-collinearity. It can be seen from the matrices below in Table 3.5 that the variables contained in the dataset of Capitec have higher correlation between variables than that of the other banks, consistent with the VIF table's results.

It is noteworthy, however, that the "group operating assets" variable in the Absa data set is highly correlated with most of the other independent variables.

Table 3.5: Correlation matrices of individual banks for explanatory variables

ABSA	GOA	P/E	EVA	NOPAT	CFROI	SVA	EP
Group operating assets	1.000						
Price / earnings	0.160	1.000					
Economic value added	0.806	0.041	1.000				
Net operating profit after tax	0.897	0.200	0.933	1.000			
Cash flow return on investments	-0.735	0.219	-0.524	-0.559	1.000		
Shareholder value added	0.827	0.160	0.972	0.979	-0.495	1.000	
Economic profit	-0.316	-0.021	0.242	0.025	0.370	0.193	1.000

CAPITEC	GOA	P/E	EVA	NOPAT	CFROI	SVA	EP
Group operating assets	1.000						
Price / earnings	0.659	1.000					
Economic value added	0.871	0.362	1.000				
Net operating profit after tax	0.961	0.633	0.927	1.000			
Cash flow return on investments	0.492	0.839	0.265	0.406	1.000		
Shareholder value added	0.933	0.457	0.985	0.963	0.338	1.000	
Economic profit	0.739	0.623	0.524	0.735	0.359	0.648	1.000

NEDBANK	GOA	P/E	EVA	NOPAT	CFROI	SVA	EP
Group operating assets	1.000						
Price / earnings	0.222	1.000					
Economic value added	0.066	-0.122	1.000				
Net operating profit after tax	0.401	-0.142	0.737	1.000			
Cash flow return on investments	-0.588	-0.780	-0.342	-0.404	1.000		
Shareholder value added	0.245	-0.236	0.803	0.975	-0.275	1.000	
Economic profit	-0.761	-0.299	0.512	0.119	0.329	0.296	1.000

FNB	GOA	P/E	EVA	NOPAT	CFROI	SVA	EP
Group operating assets	1.000						
Price / earnings	-0.673	1.000					
Economic value added	0.273	-0.126	1.000				
Net operating profit after tax	0.538	-0.450	0.676	1.000			
Cash flow return on investments	0.005	-0.211	-0.124	-0.001	1.000		
Shareholder value added	0.270	-0.213	0.818	0.931	-0.074	1.000	
Economic profit	-0.627	0.433	0.407	0.170	0.178	0.467	1.000

STANDARD BANK	GOA	P/E	EVA	NOPAT	CFROI	SVA	EP
Group operating assets	1.000						
Price / earnings	0.350	1.000					
Economic value added	0.173	-0.053	1.000				
Net operating profit after tax	0.421	0.018	0.814	1.000			
Cash flow return on investments	-0.225	-0.385	0.107	0.322	1.000		
Shareholder value added	0.168	-0.050	0.964	0.820	0.032	1.000	
Economic profit	-0.773	-0.347	0.349	0.001	0.070	0.411	1.000

Testing for linearity

When an OLS regression is done it is assumed that the relationship between the dependent and independent variables are linear. Should this not be the case, the regression will try to fit a straight line to data that does not follow a straight line (Wooldridge, 2009:167).

For the purpose of checking this assumption, acrplot graphs were created. These graphs plot an augmented component-plus-residual against the independent variables. The acrplots for the log of average share prices and log of year end share prices at Absa can be seen here, which indicates a clear linear trend between the dependent and independent variables.

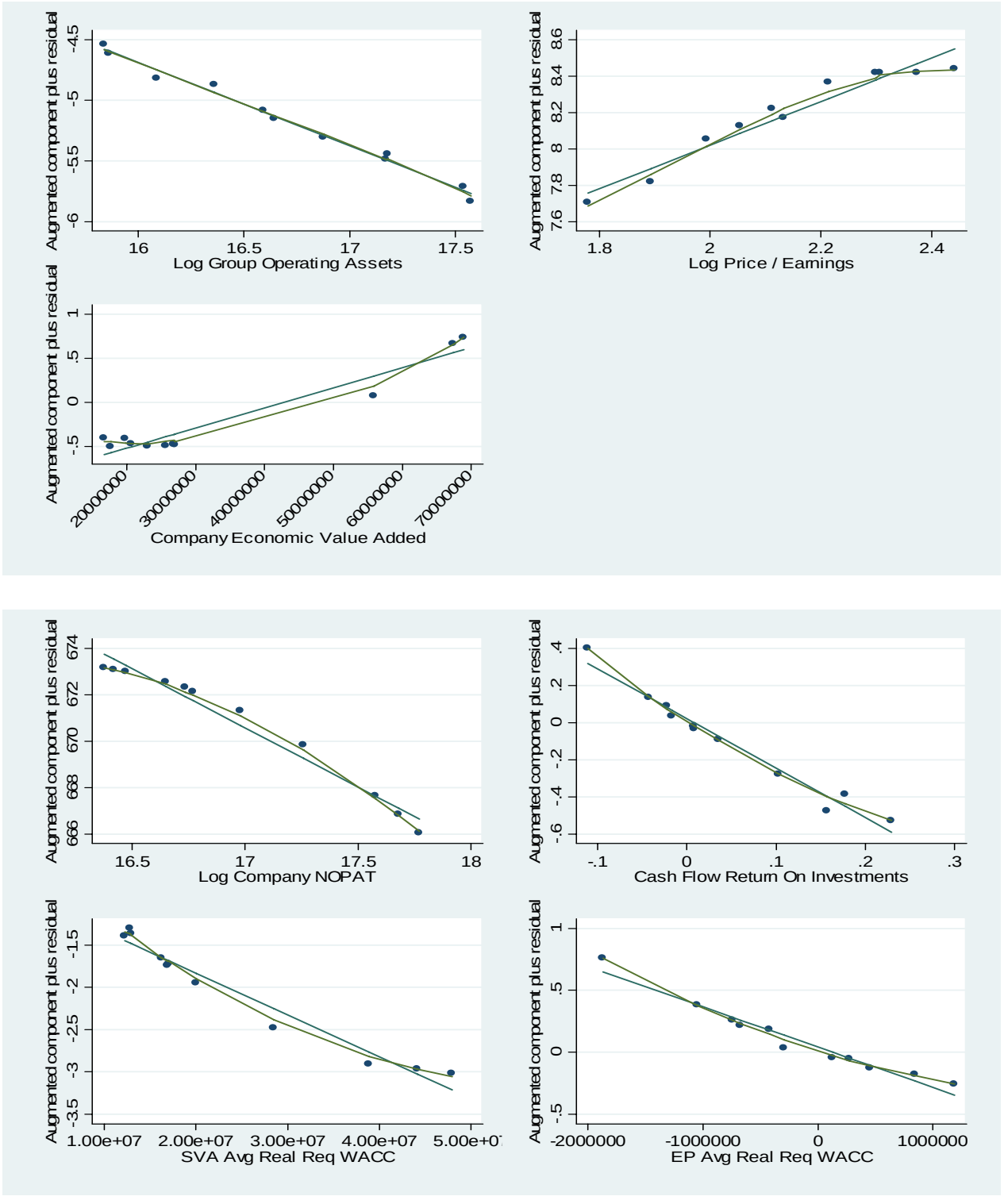

Figure 3.5: ABSA: Augmented component plus residual versus explanatory variables - Log average share price

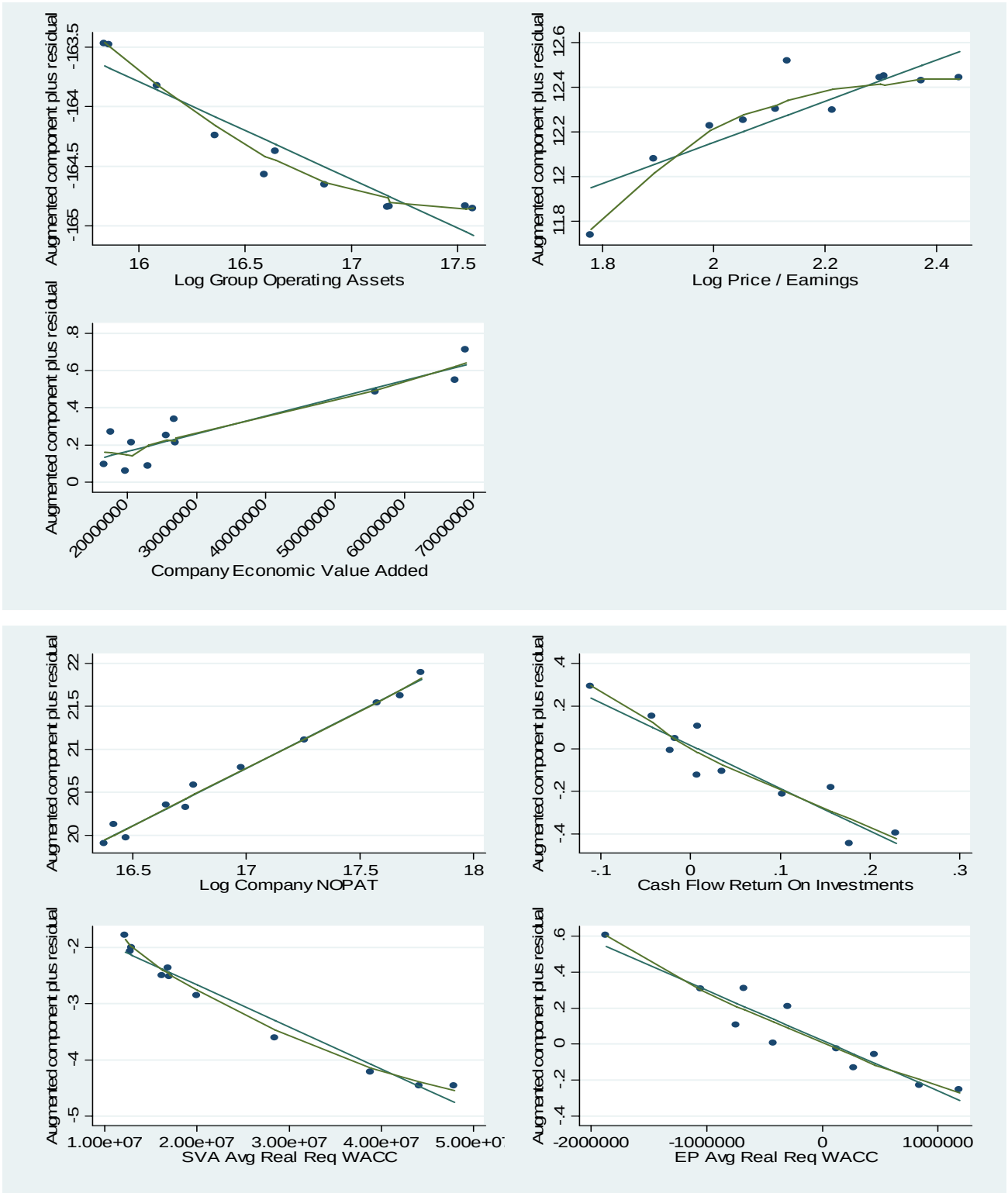

Figure 3.6: ABSA: Augmented component plus residual versus explanatory variables - Log year end share price

Considering the other banks, Capitec has the problem of multi-collinearity, rendering it a moot point to continue with the data. Nedbank, First National Bank and Standard Bank, however also indicated problems with the linearity of some of the data available on the independent variables; however this could be due to the fact that there are very few observations in each set.

The graphical presentation of selected variables of Nedbank can be seen below in Figure 3.7. These graphs are very similar to that of First National Bank and Standard Bank.

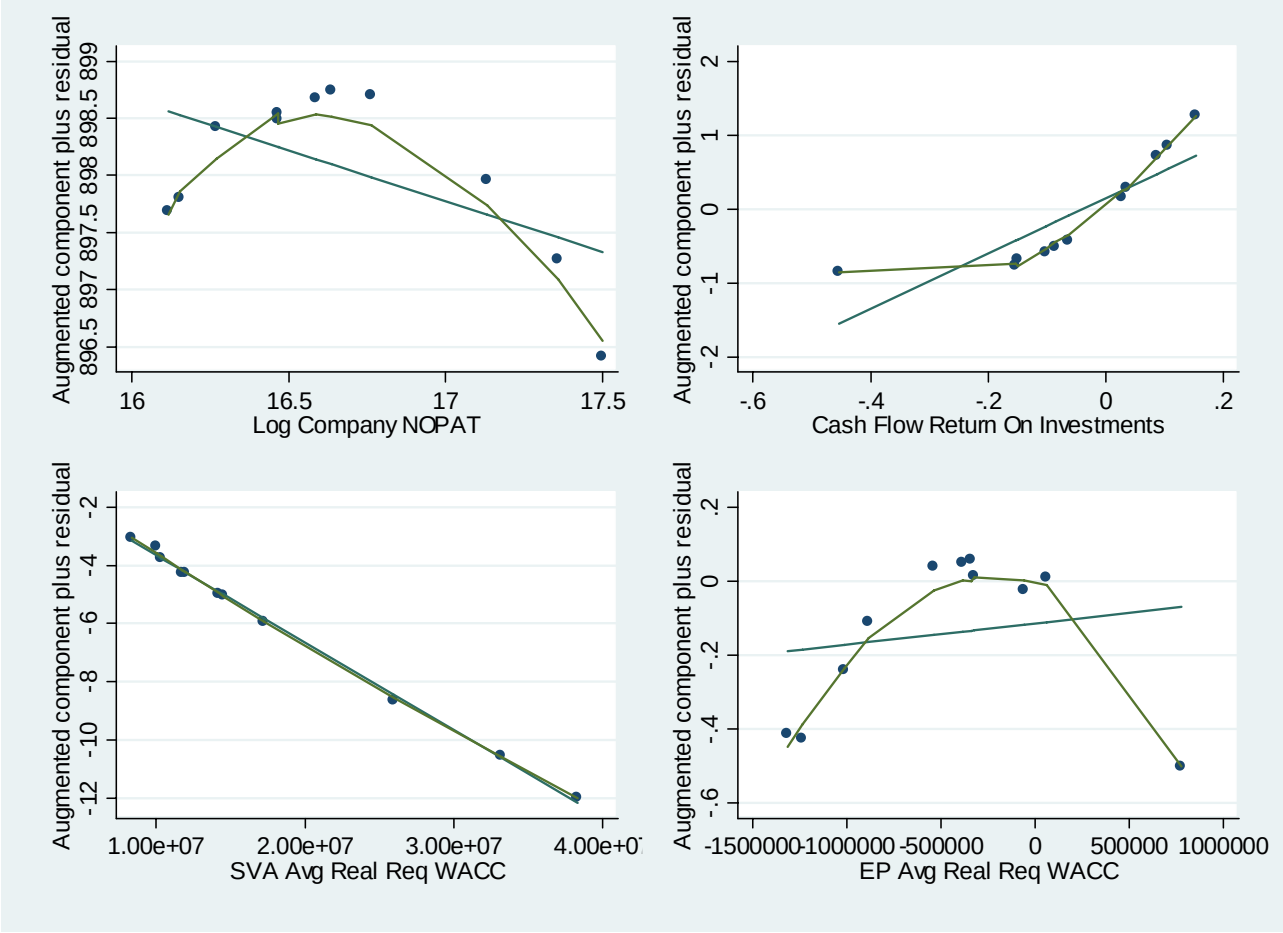

Figure 3.7: Nedbank: Augmented component plus residual versus explanatory variables - Log year end share price

Testing for autocorrelation

For the purpose of detecting autocorrelation, otherwise known as serial correlation, a Durbin-Watson (Wooldridge, 2009:415) test was performed on the data of the respective banks. This test is based on the assumption that the errors (studentized residuals) in the estimation are derived from a first order autoregressive $(AR1)$ process, expressed as $\varepsilon t = \rho \varepsilon t - 1 + at$, where εt represents the error term at period t, at is a normal and independently distributed random variable, with mean equal to zero and variance equal to σ^2 , $(NID\ (0, \sigma^2))$ and $\rho(|\rho| < 1)$ is the autocorrelation parameter. It is thus assumed that a simple linear regression model with first-order autoregressive errors is expressed as $yt = \beta 0 + \beta 1xt + \varepsilon t$, where $\varepsilon t = \rho \varepsilon t - 1 + at,$ with yt and xt, the observations on the dependent and independent variables at time period t.

The null hypothesis of the Durbin-Watson test states that there is no serial correlation present in the regression.

As a rule of thumb, the d-statistic indicates extreme positive autocorrelation for values close to zero (this is the case where standard errors of the coefficients are too small). Values close to four indicate extreme negative autocorrelation (standard errors are too large), whereas values close to two indicate no autocorrelation. Values between 1.5 and 2.5 generally indicate the independence of observations (no autocorrelation).

In all cases, the p-value was larger than 0.05 which leads to the null hypothesis not to be rejected. As such it was found that there is no serial correlation present in any of the individual regressions.

Table 3.6: ABSA - Test for serial correlation

Durbin's alternative test for autocorrelation			
lags(p)	**F**	**df**	**Probability > F**
1	4.968	(1, 2)	0.1556
H0: no serial correlation			
Durbin-Watson d-statistic (8, 11) = 2.945819			

Table 3.7: Nedbank - Test for serial correlation

Durbin's alternative test for autocorrelation			
lags(p)	**F**	**df**	**Probability > F**
1	1.72	(1, 2)	0.32
H0: no serial correlation			
Durbin-Watson d-statistic (8, 11) = 2.303079			

3.3.2.2 Individual regression output

The individual regression results are displayed below. The highlighted values indicate those parameter estimations that were found to be significant at either a 1, 5 or 10% level. These are indicated with stars next to the estimation. Here one star (*) indicates that $p<0.05$, and as such the coefficient is significant at a 5% level of significance. Two stars (**) indicate $p<0.01$, a 10% level of significance and at three stars (***), $p<0.001$, a 1% level of significance.

Table 3.8: Individual regression output: Absa, Capitec and Nedbank

	Absa		Capitec		Nedbank	
Variable	**log average share price**	**log year end share price**	**log average share price**	**log year end share price**	**log average share price**	**log year end share price**
Log group operating assets	-.70023766*	-0.47636021	-11.607816	-3.0525689	0.93746698	0.88272557
Log price/earnings per share	1.3278948**	1.1613652*	6.405345	2.8191326	0.75420806	0.53037183
Economic value added	2.33E-08	9.50E-09	-0.00014804	-0.00004158	3.04E-08	2.14E-08
Log net operating profit	0.69873818	1.3231845	-1.174521	-0.25270221	4.5485434	3.6906615
Cash flow return on investments	-2.7771393**	-2.070236	-3.2100646	-1.1170125	7.6858225	6.3811161
Shareholder value added	-2.74E-09	-1.05E-08	0.00024266	0.00006967	-2.13E-07	-1.71E-07
Economic profit	-3.063e-07*	-2.71E-07	-0.00001426	-4.16E-06	4.53E-07	4.16E-07
Intercept	4.9247684	-8.3818708	143.57894	39.276645	-80.181896	-65.027276
N	11	11	8	8	11	11

From the output displayed in Table 3.8 it is seen that for data on Absa bank, the coefficient estimations that were rendered significant in explaining the "log of average share price" were those of variables: "log group operating assets", the "log of price/earnings per share", "cash flow return on investments" and "economic profit", although the effect of "economic profit" is zero. From the coefficients it is evident that a 1% increase in "group operating assets" would lead to a 0.7% decrease in the average share price, whereas a 1% increase in the price/earnings per share would lead to a 1.3% increase in the average share price. An increase in the "cash flow returns on investment" would have a negative impact on the average share price. In determining the effect of the variables on the "log of year end share prices" the only significant parameter is the "log of price/earnings per share".

Table 3.9: Individual regression output: First National Bank and Standard Bank

	FNB		Standard Bank	
Variable	**log average share price**	**log year end share price**	**log average share price**	**log year end share price**
Log group operating assets	-0.22027812	-0.16909449	0.27848182	0.42811822
Log Price/earnings per share	0.28721486	0.88083494	0.57870112	0.88072122
Economic value added	1.63E-08	1.15E-08	-5.22E-09	3.66E-09
Log net operating profit	-0.8461111	-0.859543	0.01669687	0.29806952
Cash flow return on investments	0.29172444	0.45226555	0.01001174	-0.70966866
Shareholder value added	6.43E-08	7.29E-08	2.53E-08	7.80E-10
Economic profit	-2.43E-07	-2.788e-07*	-9.70E-08	-4.86E-08
Intercept	22.516068	20.369972	1.1101151	-6.4655806
N	11	11	11	11

FNB has two significant estimation parameters, one for each respective dependent variable. The only VBM variable, "economic profit", significant in explaining the "log of year end share price", however, shows a coefficient of zero. This is similar to that of the first regression of Absa.

Considering the other banks, Capitec, Nedbank and Standard Bank failed to have any significant coefficient estimations. The reason could definitely be ascribed to the use of small data sets and the problem of linearity previously discussed.

3.3.2.3 Pooled regression

After running the individual regressions, a pooled panel data model was run for both dependent variables. Data from all the previously mentioned banks were included.

Testing for outliers

Outliers were found among the observations, by predicting the studentised residuals. As indicated before, a residual value higher than the absolute value of two is indicative of an outlier and attention should be paid to determine that it is not due to a collection error. These values have been highlighted below in table 3.10.

Table 3.10: Five highest and lowest studentized residuals for pooled model

Pooled model

residual log average share price		**residual log year end share price**	
HIGH		**HIGH**	
-2.091777	NEDBANK	-2.53465	NEDBANK
-2.035086	CAPITEC	-2.160169	CAPITEC
-1.763153	FIRSTRAND	-1.775787	FIRSTRAND
-1.762076	CAPITEC	-1.636161	FIRSTRAND
-1.64234	FIRSTRAND	-1.583785	CAPITEC
-1.539893	FIRSTRAND	-1.550146	FIRSTRAND
-1.487395	FIRSTRAND	-1.537302	FIRSTRAND
-1.485474	FIRSTRAND	-1.519591	FIRSTRAND
-1.481786	FIRSTRAND	-1.456305	FIRSTRAND
-1.334171	FIRSTRAND	-1.325995	FIRSTRAND
residual log average share price		**residual log year end share price**	
LOW		**LOW**	
.9661856	CAPITEC	.9845364	NEDBANK
.9913383	NEDBANK	1.012853	CAPITEC
1.090904	NEDBANK	1.043156	ABSA
1.215408	NEDBANK	1.134835	NEDBANK
1.216493	CAPITEC	1.172392	NEDBANK
1.314103	NEDBANK	1.242333	CAPITEC
1.362632	CAPITEC	1.271226	NEDBANK
1.645234	NEDBANK	1.43601	NEDBANK
1.755186	NEDBANK	1.74449	NEDBANK
3.042421	STANBANK	3.145998	STANBANK

Upon careful consideration it was decided not to exclude any of these observations, as the exclusion of these outliers might further harm the reliability of the output.

Testing for the normality of residuals

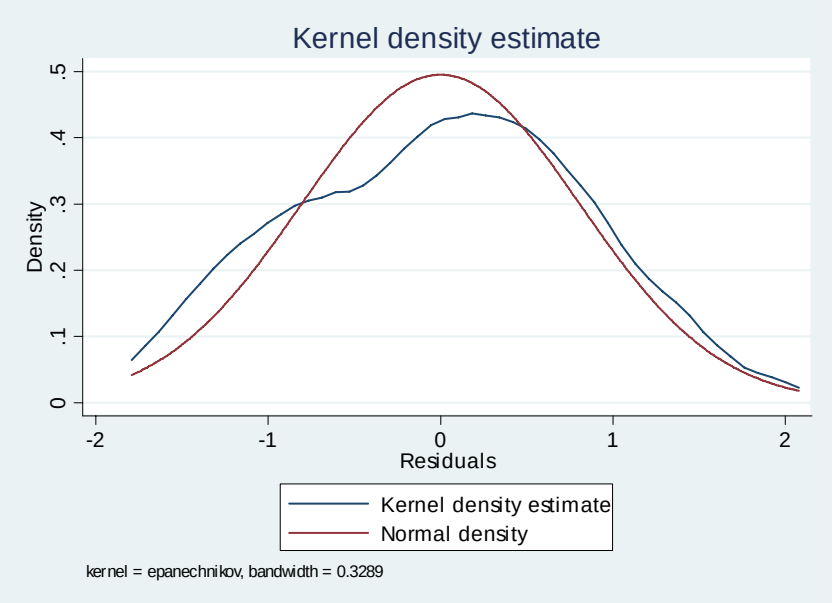

Figure 3.8: Pooled model: Kernel density estimate - Log average share price

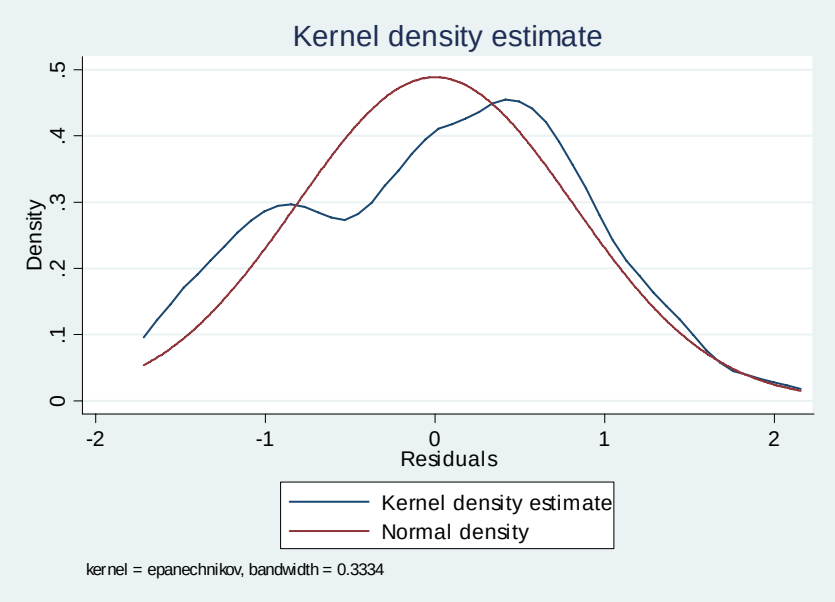

Figure 3.9: Pooled model: Kernel density estimate - Log year end share price

The above graphs in Figure 3.8 and Figure 3.9 are representative of the respective normal distribution of the errors when the log of the average share price and the log of the year end share price are modelled for the pooled model.

The Shapiro-Wilk test indicated that both regressions with dependent variables, the log of average share price and the log of year end share price have residuals that are normally distributed. This conclusion could be drawn, after a hypothesis test with a null hypothesis of normally distributed errors could not be rejected with the calculated test statistic. Thus the errors are normally distributed.

One Shapiro Wilk test for the pooled model is shown in Table 3.11.

Table 3.11: Shapiro-Wilk test for normal data (pooled model)

Variable	Observations	W	V	z	Probability > z
Residual log year end share price	52	0.96329	1.781	1.233	0.10871
H0: Data normally distributed					

Testing for heteroscedasticity

No constant variance in the distribution of the error terms (Wooldridge, 2009:264).

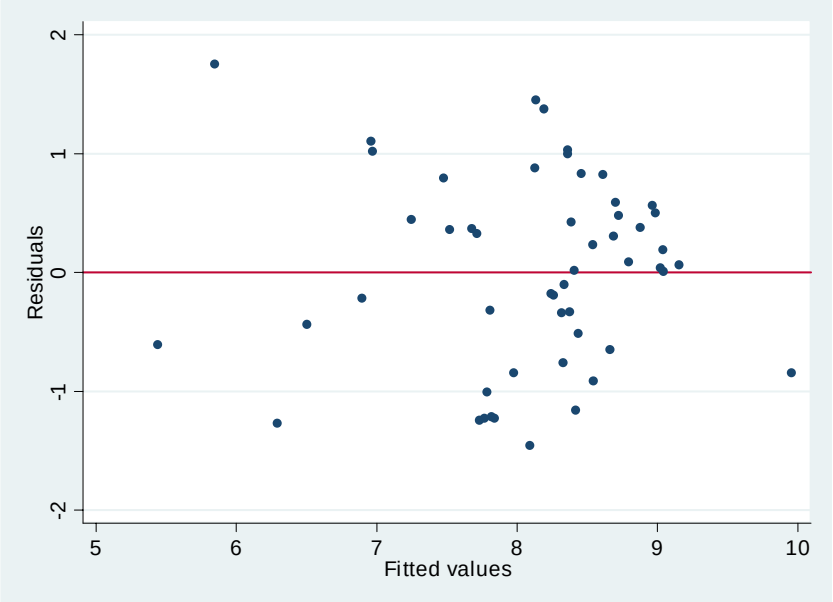

Figure 3.10: Pooled model: Residuals versus fitted values - Log average share price

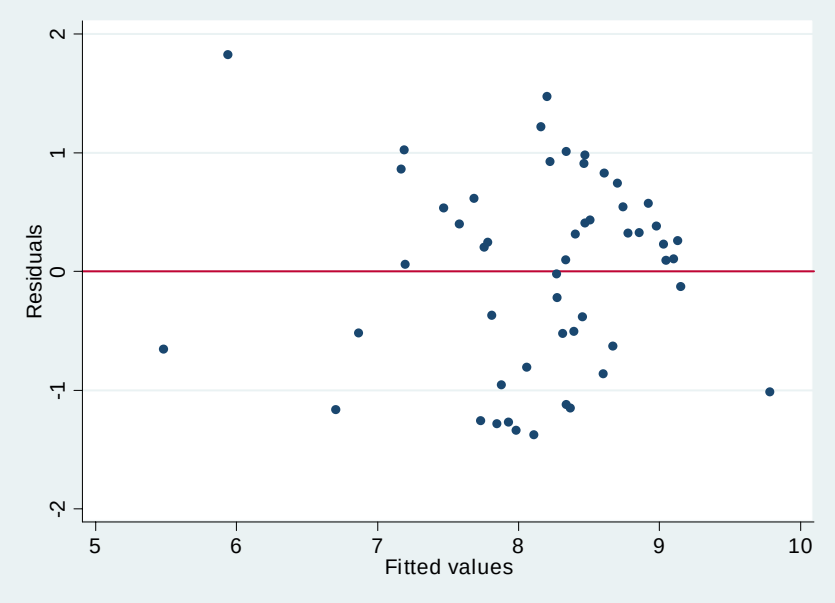

Figure 3.11: Pooled model: Residuals versus fitted values - Log year end share price

The above graphs in Figure 3.10 and Figure 3.11 show plots of the residual versus the fitted (predicted) values of the two respective regressions of the pooled model.

The Breusch-Pagan/Cook-Weisberg test for heteroscedasticity was employed. The test, however, proved that the first regression suffers from heteroscedasticity, and the model should thus be adjusted to control for the problem.

The test results for the pooled model with dependent variable log of average share price are shown in Table 3.12, with p = 0.0518 the null is not rejected and it is found that the errors have a constant variance.

Table 3.12: Breusch-Pagan/Cook-Weisberg test for heteroscedasticity (pooled model)

Ho: Constant variance
Variables: fitted values of log average share price
chi2(1) = 3.78
Probability > chi2 = 0.0518

Testing for multi-collinearity

For the purpose of testing for multi-collinearity, the respective variance inflation factors (VIF) of the independent variables were calculated. A VIF equal to ten and higher is a definite cause of concern which is the case in all regressions. In the pooled model no VIFs are above ten, thus the model does not seem to suffer multi-collinearity.

Table 3.13: Variance inflation factors for pooled model

Variable	VIF
NOPAT	9.71
GOA	9.66
SVA	9.22
EVA	7.19
EP	2.17
CFROI	1.21
P/E	1.1
Mean VIF	5.75

Considering the correlation matrix of the specified variables, as an alternative to check for multi-collinearity, it can be seen from the matrix below, that the variables that seem to be correlating are fewer than in some of the individual regressions. All the variables are subsequently kept in the regression.

Table 3.14: Correlation matrix of explanatory variables for pooled model

Pooled model	GOA	P/E	EVA	NOPAT	CFROI	SVA	EP
Group operating assets	1.000						
Price/earnings	0.100	1.000					
Economic value added	0.456	-0.054	1.000				
Net operating profit	0.889	0.126	0.607	1.000			
Cash flow return on investments	0.309	0.237	0.060	0.298	1.000		
Shareholder value added	0.441	-0.041	0.922	0.653	0.067	1.000	
Economic profit	-0.506	0.006	0.104	-0.227	-0.051	0.181	1.000

Testing for linearity

When an OLS regression is done it is assumed that the relationship between the dependent and independent variables are linear. Should this not be the case, the regression will try to fit a straight line to data that does not follow a straight line (Wooldridge, 2009:167).

For the purpose of checking this assumption, acrplot graphs were created as in the case of the individual regressions.

The acrplots for the log of average share prices and log of year end share prices for the pooled model is presented in Figure 3.12 and Figure 3.13. It is clear that the linearity of several variables is a cause for concern.

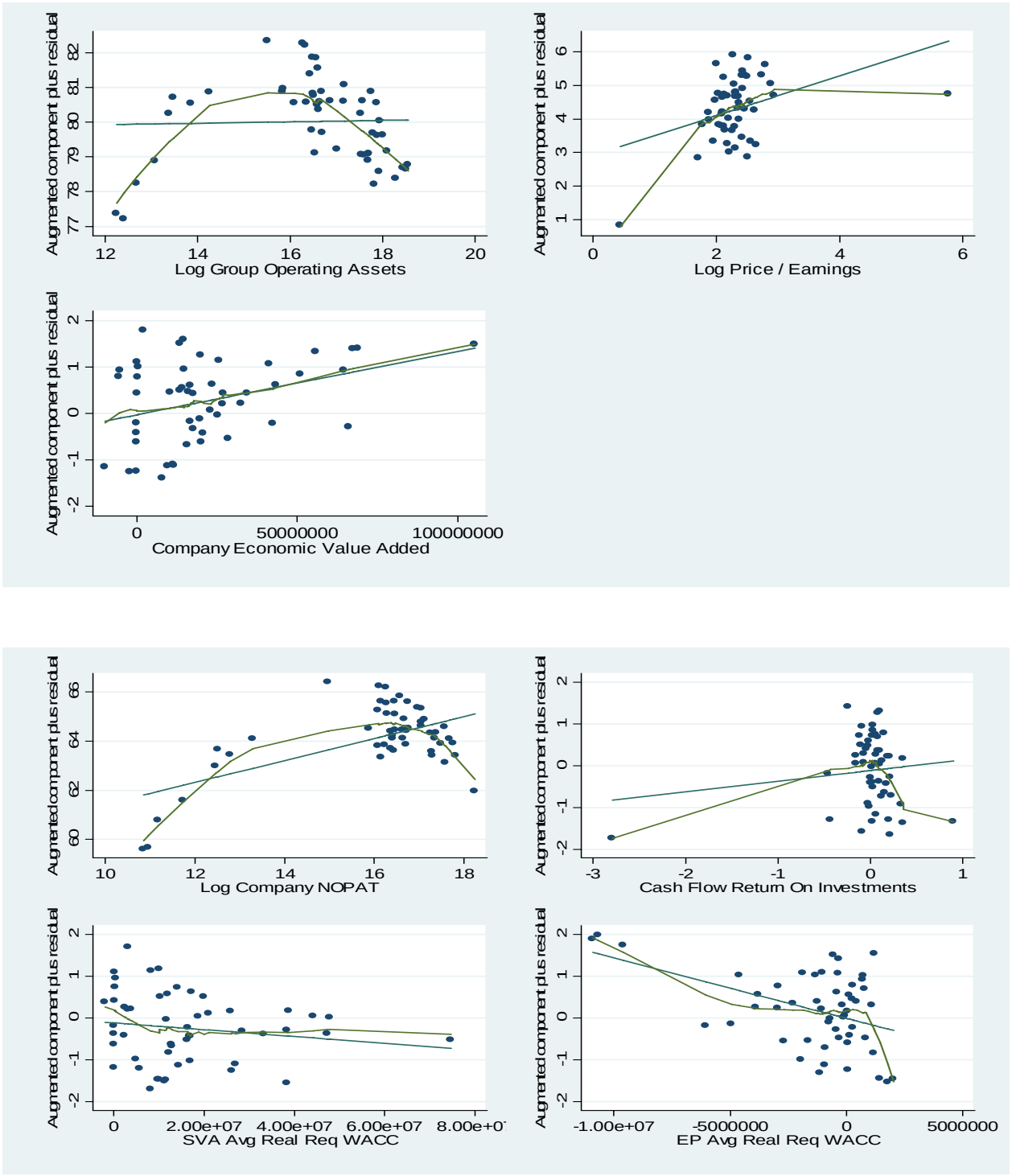

Figure 3.12: Log average share price - augmented component plus residual versus explanatory variables

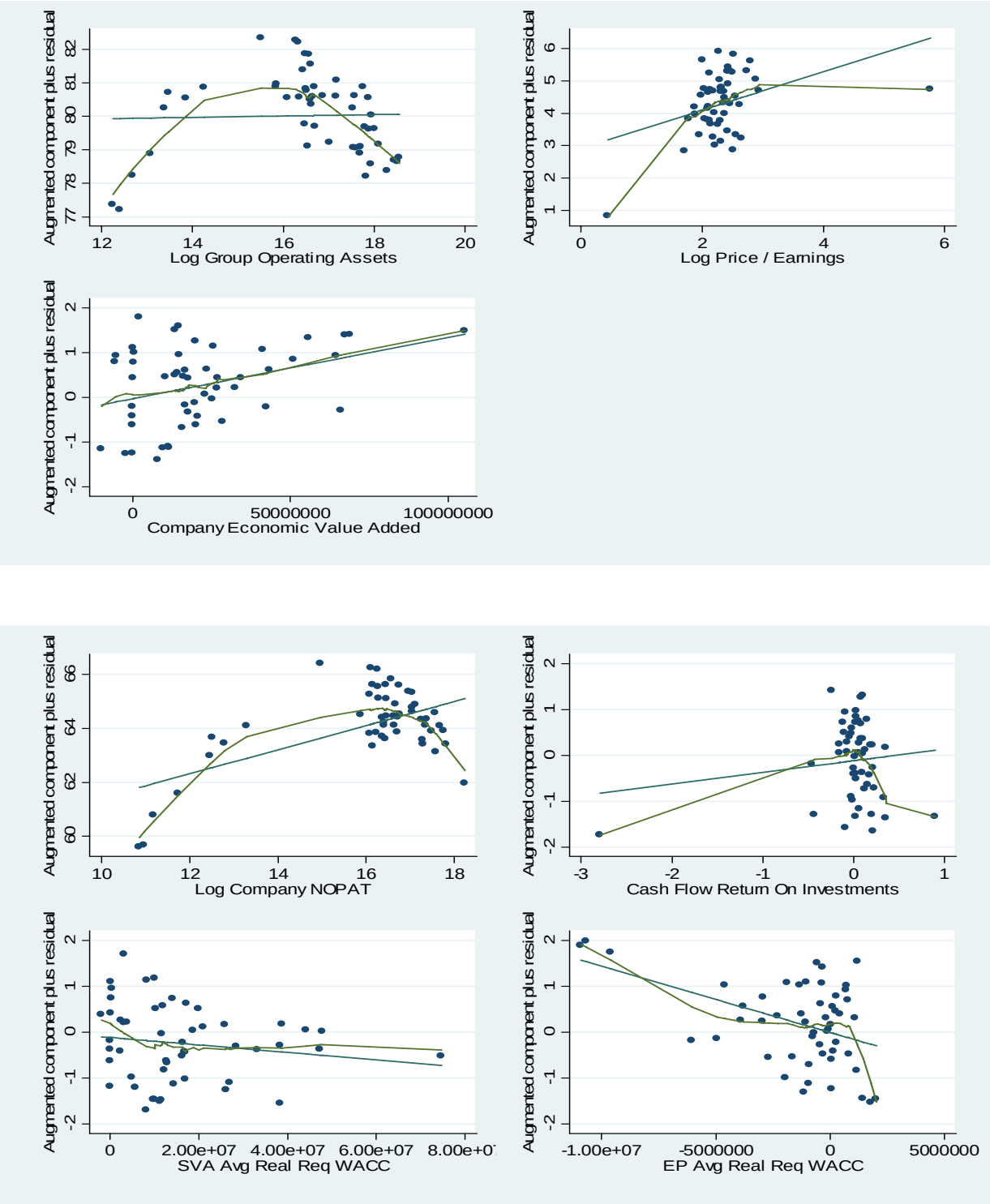

Figure 3.13: Log year end share price - augmented component plus residual versus explanatory variables

Testing for autocorrelation

For the purpose of detecting autocorrelation, otherwise known as serial correlation, a Wooldridge test for autocorrelation in panel data was performed on the dataset. The null hypothesis states that there is no serial correlation present in the regression. The p-value=0.0958, larger than 0.05 which leads to the null hypothesis not being rejected.

As such it was found that there is very little serial correlation present in the pooled regression model.

Table 3.15: Pooled model – Test for serial correlation

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
F (1, 4) = 4.711
Prob > F = 0.0958

3.3.2.4 Pooled regression output

The pooled model's regression output is presented in Table 3.16. From the output in Table 3.16 it can be seen that the respective regressions both have relatively low adjusted R-squared (R^2). In the regression modelling of the average share price, approximately 45% of the variation is explained by the explanatory variables employed in the model. In turn, approximately 40% of the variation in the year end share price is explained. The F-value indicates that the variables are jointly significant in explaining the model, in both instances.

Table 3.16: Pooled model regression output

VARIABLES	Log average share price	Log year end share price
Cash flow return on investments	0.15073	0.28351
	(0.314)	(0.305)
Log group operating assets	-0.67427*	-0.65024***
	(0.355)	(0.233)
Economic value added	0.00000	0.00000
	(0.000)	(0.000)
Log price/earnings	0.46862**	0.43469**
	(0.212)	(0.211)
Log net operating profit after tax	0.75957***	0.66849***
	(0.265)	(0.205)
Shareholder value added	-0.00000	0.00000
	(0.000)	(0.000)
Economic profit	-0.00000*	-0.00000**
	(0.000)	(0.000)
Intercept	5.59530**	6.72935***
	(2.437)	(1.860)
Observations	52	52
R-squared	0.52937	0.48392
Adj. R-squared	0.45450	0.40182
Model Sum of Squares	37.21396	31.86905
Residual Sum of Squares	33.08398	33.98691
F-test	7.30175	5.89403
Prob>F	0.00001	0.00007
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

The regressions are as follows:

(i) $$lasp = 5.59530 + 0.15073cfroi - 0.67427lgoa + 0.00000eva + 0.46862lpte + 0.75957lnopat + -0.00000sva - 0.00000ep + u$$

(ii) $$lysp = 6.72935 + 0.28351cfroi - 0.65024lgoa + 0.00000eva + 0.43469lpte + 0.66849lnopat + 0.00000sva - 0.00000ep + u$$

From the output results it is seen that in both regressions the same parameter coefficients are significant in explaining the dependent variables. These variables include "log operating assets", the "log of price earnings per share", the "log of net operating profits after tax and "economic profit".

In interpreting the results, it is recognised that a 1% increase in group operating assets would lead to a 0.67% decrease in the average share price. A 1% increase in the price earnings per share would lead to a 0.47% increase in the average share price. A 1% increase in the net operating profits of a bank would lead to a 0.76% increase of the average share price. It is, however, evident that even though the coefficients of "economic profits" are significant, the effect of a change is zero on the respective dependent variables.

In the second regression the results indicate that a 1% increase in group operating assets would lead to a 0.65% decrease in the year end share price. A 1% increase in the price earnings per share would lead to a 0.43% increase in the year end share price. A 1% increase in the net operating profits of a bank would lead to a 0.67% increase of the year end share price.

3.4 SUMMARY

The multiple regression models displayed three very significant results. These results were found in the individual models as well as the pooled model. The first was that NOPAT and P/E were shown to be the only independent variables of any importance in all of the models. CFROI proved to have some form of relevance in the tested banks. Secondly it was seen that group operating assets (GOA) had an inverse effect in the models. An increase in GOA will lead to a decrease in the share price. Thirdly, the statistical insignificance of EVA, SVA and EP as predictors of either average price per share or year end share price was illustrated.

It can thus be concluded that those variables known as the VBM metrics are inadequate in explaining the average and year end share prices, and that other variables do seem to have a significant yet small effect on the respective share prices.

CHAPTER 4
CONCLUSIONS AND RECOMMENDATIONS

4.1 INTRODUCTION

In this chapter, the research findings are explored and interpreted with regard to the research done. The evaluation of the findings will be correlated with the literature study. Through the evaluation, the research attempts to develop an understanding of whether VBM and its more recent driving metrics EVA, SVA, EP and CFROI influence the share price in the same trend as the company's financial performance.

The primary goal of the study was to determine whether VBM and its component metrics can be used as indicators for share price movement for banking companies listed on the Johannesburg Securities Exchange.

The secondary research goals were:

- To investigate and determine to what extent VBM is responsible for share price movement.
- To determine whether other measurements can be used as indicator of share price movement.

4.2 RESULTS AND CONCLUSION OF THE MAIN GOAL

4.2.1 Results

The main goal of this analysis was to investigate and determine whether investors and shareholders can use the value-based management approach to determine share price movement in South African banks listed on the Johannesburg Securities Exchange. The value-based management approach include metrics such as shareholder value analysis (SVA), economic value added (EVA), cash flow return on investment (CFROI) and economic profit (EP).

The empirical model presented in chapter three included five South African banks, and information collected, where available, on each individual bank between the years 1999 and 2009.

For the purpose of determining the movement of the share price, two separate regressions were run, each with a new dependent variable. The first dependent variable used was the "log average share price" and the second, the "log year end share price". Initially individual regressions were run to determine whether the value management approach could be applied to the individual banks in the dataset; however a lack of data (very few observations) indicated that no valid conclusions could be drawn. Subsequently a pooled model was created, running over the years 1999 to 2009, for the five JSE-listed banks.

Interestingly, when considering the two regression outputs for the pooled model, it is found that the variables included in the model are jointly significant in explaining the share price movements. However, the adjusted R^2 for both models indicate that between 40% and 45% of the variation in the respective share prices are explained by the explanatory variables. This indicates that there are definite other factors or metrics that should be used to explain the variation in the respective share price movements.

4.2.2 Conclusions

The regression results, presented in chapter three allows us to conclude that value-based management, which include metrics such as shareholder value analysis (SVA), economic value added (EVA), cash flow return on investment (CFROI) and economic profit (EP) are ineffective in explaining share price movements. Although economic profit provided significant results in both regression models, the parameter coefficient was equal to zero. It should however be noted that those variables other than the value-based metrics were overall more significant at levels varying between one, five and 10%. These financial measures include the "log operating assets", the "log of price earnings per share" and the "log of net operating profits", which are significant in both regressions.

Noteworthy is that even though these variables are significant, the impact of a change in them, respectively, are relatively diminutive as a 1% change in any of these measures leads to a change of between a 0.67% decrease and a 0.76% increase in the share price movements, well below a 1% change. The problem of the clear lack of impact of these variables could possibly be ascribed to the problem of endogeneity and the definite effect of the high correlation between the explanatory variables, caused by these variables containing similar factors in their calculations.

As such the conclusion could be drawn that alternative explanations and additional measures should definitely be considered when aiming to explain share price movements, and that VBM and its component metrics cannot independently be used as indicators thereof.

4.3 RESULTS AND CONCLUSION OF SUB-OBJECTIVES

4.3.1 Results

Interpreting the results of other financial measurements tested, it is recognised that a 1% increase in group operating assets (GOA) would lead to a 0.67% decrease in the average share price. A 1% increase in the price earnings per share (P/E) would lead to a 0.47% increase in the average share price. A 1% increase in the net operating profits (NOPAT) of a bank would lead to a 0.76% increase of the average share price.

4.3.2 Conclusions

In the proposed models, to calculate the respective average share price and year-end share price, P/E, NOPAT and GOA are the most dominant elements. In the models some of the dependent variables are negative, which can make business sense, especially in terms of GOA. This suggests that these value creation measurements should decrease, should an increase in share price be predicted. It might therefore be more prudent to use only the P/E or NOPAT as a predictor of share price movement.

4.4 RECOMMENDATIONS

4.4.1 Investment criteria

Value-based management is a structured approach to measure the performance of a firm's unit managers or products in terms of the net benefit they provide to shareholders. It is seen as a moderator together with other tools, such as the balanced scorecard for creating wealth for a company's shareholders.

Investors must also consider other important indicators and measurement tools when deciding upon investing in a certain company. An important indicator for the equity market is the gross domestic product (GDP). This is the value of all goods and services produced in a specific country. The percentage change in the GDP, after adjusting for inflation, is considered an important indicator of the condition of the economy. The higher the number, the faster the economy is growing. Another consideration in buying

equity is dividends and their yields. This important indicator is the percentage rate of return that is currently realized. It is calculated by dividing the dividend by the stock price. The higher the price of the stock, the lower the yield will be. Most stocks that pay a dividend have a more stable price and may not increase in value as quickly as a growth stock. However, the cash dividend increases the value of the stock. These dividends can be taken as cash or they can be automatically reinvested into more shares. Utilities are a good example of stable stock that pay a good dividend.

The price/earnings (P/E) ratio is an important indicator to consider when buying equity. Dividing the price of the stock by the company's annual earnings per share easily arrives at this ratio. The P/E ratio is commonly used to calculate how many years it will take to cover the initial investment.

Another common indicator to consider when buying stocks is the price-to-book ratio. This measuring stick compares the price of the stock to the company's book value. This can be derived from the total assets, minus liabilities, divided by the number of outstanding shares.

Investors should also consider the long-term sustainability of a company's performance and competitive advantage. In this regard, it would be prudent to evaluate the company's ability to generate economic profit, as it is an indication that the company can invest capital at returns higher than the cost of capital.

4.5 SUGGESTIONS FOR FURTHER STUDIES

In the course of the current study, a number of areas were identified where further research could be beneficial:

Additional consideration for further studies:

- Repeat the exercise for companies in different sectors listed on the JSE that use VBM. Recalculate the model to see if VBM metrics are still such insignificant explanatory variables.
- Test all other financial and non-financial measurements in the balance sheet to see if they will not have a better explanatory effect on the companies' share price.

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