AN ANALYSIS OF THE RELATIONSHIP BETWEEN ACCOUNTING INDICATORS AND SHARE PRICE ON THE NAMIBIAN STOCK EXCHANGE

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Abstract

Extensive research has proven the stock market to be a catalyst for economic development, more so in emerging African economies. Over time, finance has established several methods used to evaluate performance of stock markets. One of these is the return model which describes the relationship between stock returns and accounting earnings, this model has roots in behavioral finance and is the reference point for this study. Other models have proven to be too complex for most small and developing stock markets, which generally suffer from low liquidity and low market capitalization. The major issue with the more sophisticated models is the set of assumptions which are not achievable by a market such as the Namibian Stock Exchange (NSX). In this study, the researcher has used panel regression analysis to propose a model that relates fundamental accounting indicators to the movement in stock prices of companies traded on the NSX. In doing so, the researcher found a number of statistically significant relationships between the latter and the former. Sales, earnings per share, dividend per share, market value and return on assets all showed positive relationships with the share price. However, the coefficient corresponding to return on assets was statistically insignificant while earnings per share showed the strongest significant relationship to the share price. Additionally, the results for net profit were unexpected as they indicate an inverse relationship with the share price. Ultimately, these findings allowed the researcher to draw conclusions about value relevance of accounting information presented by companies listed on the NSX. Such conclusion is that these statements produce information that is relevant to investors on this stock market and that explains why the study found positive relationships between the share price and accounting indicators that are calculated from these financial statements. The inferences drawn from the findings and the model produced by this study bring together the fields of accounting and finance and points to a pivotal interconnection of these disciplines on the NSX and that is peculiar to this study and is its main contribution to literature on these vital subjects.

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Dedication

This thesis and all the effort it took to finish it is dedicated to my baby girl, she served as a constant source of motivation and encouragement especially when it all seemed futile. Being her mother is a precious gift as it catapults me to achieve more than I thought I was ever capable of. And to my late brother Bjorn, for raising, loving and always being there for me.

Declaration

I, Sharon V Tjiueza, hereby declare that this study is my own work and is a true reflection of my research, and that this work, or any part thereof has not been submitted for a degree at any other institution.

Sharon Verora Tjiueza 31 May 2018

…… …… ……

Name of Student **Signature** **Date**

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List of Acronyms

APT: Arbitrage Pricing Theory

BON: Bank of Namibia

CAPM: Capital Asset Pricing Model

CSD: Central Securities Depository

EMH: Efficient Market Hypothesis

IFRS: International Financial Reporting Standards

JSE: Johannesburg Stock Exchange

NFSS: National Financial System Strategy

MOF: Ministry of Finance

NPC: National Planning Commission

NSX: Namibian Stock Exchange

ROA: Return on Assets

UNAM: University of Namibia

VIF: Variance Inflation Factor

CHAPTER ONE INTRODUCTION

1.1 Background to the study

Research has proven the stock market to be a catalyst for economic development the world over, for developed and emerging economies. Hermes and Lensink (2013) indicate that efficient operation and deepening of stock markets is a challenge for most countries (developed and developing alike) and so it is the subject of much academic debate. Namibia as a developing nation and emerging economy is facing similar challenges as evidenced by the country's objective to craft a robust and efficient financial sector, as it recognizes the link between financial sector development and economic growth (Ministry of Finance, 2011).

Financial markets play a critical role as a tool for investment growth in Africa (Adjasi & Biekpe, 2009) as they are a platform used to channel savings to investment and thus foster economic growth. In Namibia, the stock market has shown significant growth and has become a key component of the country's financial sector (Eita, 2012). The general need for accountability and evaluation of overall performance of investments directly signals for research to help measure and improve performance of stock markets. This need is more apparent in African markets whose economies and financial markets are usually plagued by corruption and mismanagement at all levels, Namibia is no less affected as Hearn and Piesse (2013) found in their study.

Additionally, accountability and transparency serve as important elements for functional financial sectors and markets (Tsalavoutas & Dionysiou, 2014). Especially with regard to prescribed and more so, voluntary disclosure (Uyar, Kılıc & Bayyurt 2013) of information by companies which are traded publicly on an exchange. The Namibian Stock Exchange (NSX), keeping with international practice, subjects listed companies to a set of requirements. These include financial statements prepared according to International Financial Reporting Stands (IFRS) (NSX, 2016).

The operation of financial markets involves the trading of financial assets (shares/stocks) which inevitably means; the ownership of firms is separate from its management. This split then leads what is known as the agency problem (Denis, 2016), the agency problem is a conflict of self or owner interest that arises within the management of an organization. This has led to erosion in the faith that investors and shareholders have in stock markets (Ongore, 2011). This makes it necessary to put strategies in place which measure and relate performance to disclosure and thereby help evaluate such management and firm performance. Performance is measured in terms of profitability and value addition, which are critical measures of return for investors/shareholders.

These measures are used as a yardstick to evaluate firm and subsequently, management performance, the share price is a reflection by the market, of the value attached to the firm and its operations. Hence, this share price remains a key indicator of wealth created, value addition and an implied reduction in the agency problem (Bodie, Kane & Marcus, 2014).

Over time, several methods have been developed in finance which guide investors in their choice between different investment opportunities. The focal methods for this study are the Capital Asset Pricing Model (CAPM) and technical and fundamental analysis.

The latter method describes the intertwined relationship between stock returns and accounting earnings (Bettman, Sault & Schultz, 2009). The CAPM as developed by William Sharpe (1964), Jack Treynor (1962), John Lintner (1965) and Jan Mossin (1966). It is based on assumptions of the Efficient Market Hypothesis (EMH) which also assumes a rational investor who acquires and uses all the information at his disposal to inform investment decisions (Lai & Stohs, 2015).

The CAPM is regarded superior to technical and fundamental analysis as it uses a measure of risk to explain the variation in stock prices. Risk has been proven to have a positive linear relationship with the return expected from an investment (Bodie et al., 2014). This model is mostly applied in more developed and sophisticated economies with advanced markets which meet the conditions necessary to apply a model of such complexity. However, requirements of the model are extreme and in some cases unrealistic (Fama & French, 2004). Therefore, the model is not universally applicable; more so in developing economies with young teething stock markets. These juvenile markets suffer from low liquidity and low capitalization (Okeahalam & Afful, 2006; Ntim, Opong, Danbolt & Dewotor, 2011).

The Namibian Stock Exchange was originally established in 1904 following the diamond rush. The stock market was later re-launched in 1992 by an act of parliament to help create a conducive environment for investment and financial sector development (NSX, 2015). The Namibian stock market falls squarely into a category of young teething stock markets which suffer from low liquidity and low capitalization. This is due to its relatively recent resumption in 1992 and an unstable or otherwise declining market capitalization. The likes of such is a far cry from the larger, more developed Johannesburg Stock Exchange (JSE) (Hearn & Piesse, 2013), a benchmark stock market on the African continent.

This difference in market size and liquidity calls for the use of alternative methods and models, one such alternative is the return model, founded on theories in fundamental and technical analysis. This model explores the significance of the relationship between fundamental accounting indicators and the movement in stock prices (Delen, Kuzey & Uyar, 2013). The agency problem added to political factors unique to Africa, have increased the need for accountability and reliability of information available to investors and other stakeholders.

Thus, the importance of accounting information cannot be emphasized enough as this information reflects the results from operations as directed by firm management as well as the earning ability of a firm given its economic and political environment (Nyabundi, 2013). The reports thereby produced will show how well a firm has employed its earning ability up to a certain point in time. The capacity of these accounting numbers to show such earning abilities and summarize the information underlying the stock prices is what Alali and Foote (2012) define as the value relevance of accounting information.

Consequently, researchers have applied the theory of value relevance to help them emphasize the important role of financial reporting in the investment decision process (Magena, Kimman & Citron, 2008; Hussainey & Mouselli, 2010; Nyabundi, 2013). It is expected that a significant positive relationship between accounting indicators and the share price will show that the agents of the firm actually pursue the interests of shareholders. This is evidenced by wealth maximization and value addition as indicated in the share price. Moreover, such an outcome encourages participation on the market as it instills investor confidence. This participation enhances financial sector performance in the economy which inevitably edges economic growth forward.

1.2 Problem statement

The use of statistical analysis to determine the relationship between various accounting indicators and a company's stock price has been explored by several researchers such as Oppong (1993), Ohlson (1995), Abekah (2005) and Paliwal (2011). The objective was to avoid reliance on the CAPM since the conditions for the application of the model often do not exist in emerging African markets. The NSX lags behind in terms of trading volume, liquidity and the level of sophistication expected to support advanced models which measure the performance of stocks and portfolios on the market (Ntim et al., 2011). This shortfall is evident from the small number of primary listings vis-a-vi secondary listings. The implication of these shortcomings is that the potential for economic expansion which comes with a healthy financial sector is diminished.

The impracticality of using a sophisticated model requires the use of alternative measures as a remedy or substitute. The resulting effect is a boost in investor confidence and participation in the stock market, and consequently, the financial sector of the economy (Denis, 2016). Disclosure of company information on an annual or semi-annual basis in the form of financial statements, which prescribe to a specified set of accounting standards, is a world-wide practice. Such statements are deemed to provide invaluable information to stakeholders in general and investors in particular; accounting records are used widely by investors for decision making. And, according to Alali & Foote (2012) the primary purpose of financial reporting is prescribed as the provision of key information to help such investors make rational decisions.

These decisions have an ultimate underlying influence on stock prices and establishing a relationship between stock prices and key accounting indicators will further legitimize the continued reliance by the investor plowing funds into Namibia, on accounting information. The NSX presents ideal characteristics as a testing ground for such a model and it is yet to be discovered whether the value relevance of accounting information is strong enough to explain the movement in stock prices on the exchange.

1.3 Research questions

The above problem informs the following research questions:

- What is the nature of the relationship between specified accounting fundamental indicators and share prices, in stocks listed on the Namibian Stock Exchange over a ten-year period, 2004 – 2013?
- Is there an alternative model obtainable that will be used to explain the relationship between specified accounting fundamental indicators and share price in stocks listed on the Namibian Stock Exchange?
- Do the records of companies listed on the Namibian Stock Exchange indicate value relevance of accounting information?

1.4 Research objectives

This study has the following objectives:

- to understand the nature of the relationship between specified accounting fundamental indicators and share price over a ten-year period (2004 – 2013), in stocks listed on the Namibian Stock Exchange.

- to develop an alternative model that will be used to explain the relationship between specified accounting fundamental indicators and share price in stocks listed on the Namibian Stock Exchange
- to ascertain the value relevance of accounting information recorded by companies listed on the Namibian Stock Exchange.

1.5 Significance of the study

The stock market is an important part of the financial system of a country, related to mobilization of capital and the level of investment and saving (Yartey & Adjasi, 2007). The financial sector is an important part of the economy through households, the business/corporate sector and government. These players combine in different roles as regulators, clients and intermediaries; and so they are all subject to the how well the stock market performs. This study explores possible solutions to real concerns of these key players such as local capital formation, diversification by foreign investors and improved disclosure requirements. These concerns are directly related to market performance and the level of reliability on information provided by the market in question. The study will address these concerns for investors, financial intermediaries and other players in the Namibian financial sector, by developing an alternative model used to gauge their stock and portfolio performance.

The study sets precedence for the use of fundamental analysis in Namibia and comparable emerging economies. Additionally, the results disclose the value relevance of accounting information in reports of firms listed on the NSX. This disclosure encourages investors to continue their reliance on these reports. It also reminds the accounting profession of the important role they play which stresses the need for objectivity, consistency and accuracy in their reports.

1.6 Research methodology

The study followed a quantitative approach and employed secondary financial statement data used to calculate accounting indicators. These indicators act as the independent variables used to explain variation in the dependent variable which is the share price of selected companies over a ten year period 2004 – 2013. Ethical considerations in data validity, reliability and integrity were adhered to. Consideration was also given to additional mandatory ethical concerns prescribed by the University of Namibia through its policy on research ethics, UNAM (2013).

1.7 Limitations of the study

Although it justifies the approach used for the study, the small size of the NSX and the thin trading volume that comes with small exchanges poses a challenge to the researcher during data collection; in that the number of data values available is small. This hurdle was also encountered while choosing the sample as the number of listed companies is relatively small and delisting occurs occasionally. Some financial reports were inconsistent as they reported consolidated statements in some years and company and group separately in others. Also, monthly company data as proposed originally was not readily available and this forced the use of annual figures.

Finally, the majority of companies listed on the NSX are not Namibian firms and this does not give a purely Namibian context although such firms have set up large operations in Namibia. Missing data from several companies which were part of the original sample caused some companies to fall out of the study completely and others to be analyzed with missing figures.

Many companies listed on the NSX are multinationals and some of these reported in other currency other than the Namibian dollar which brought about translation problems. This was exacerbated by the fact that financial statements were not consistently prepared in a format that allowed for foreign currency translation. Dealing with multinationals for a ten year period also meant that the standards followed for reporting in some years were different for different firms. This is because harmonizing accounting standards of reporting at an international level was and is still ongoing.

1.8 Structure of the remaining part of the thesis

The rest of the report reads as follows; Chapter two presents a review of the literature through a theoretical framework. Chapter three is the methodology which outlines how the study was conducted, while Chapter four presents and discusses the findings of the data analysis. The report is then concluded in Chapter five, with practical implications of findings as well as recommendations for possibilities of future research.

1.9 Conclusion

This chapter gave a background, a justification and clear objectives for the study given a number of limitations. Armed with an understanding of why the researcher chose this study specifically, the next chapter is an extensive review of literature on the subject, showing the theoretical background for the study while it captures the works of other researchers which helps to contextualize, synthesize and further justify this study and its chosen objectives.

CHAPTER TWO LITERATURE REVIEW

2.1 Introduction

A survey of the literature shows similar studies from different perspectives using different methodologies and styles. This consequently informs of gaps in literature to be filled or even new ones created by this current study using its own methodologies and styles. This chapter starts with definitions of terms, followed by a theoretical framework and then the relevant literature is divided into 4 categories being the role of stock markets in Africa, followed by stock price behavior in emerging markets. This section is trailed by a description of models which explain movements in stock prices, such models are subdivided into the CAPM and the alternative models similar to that adopted in this study. Before the conclusion to this chapter, accounting relevance is conceptualized and then a conceptual framework is outlined.

2.2 Definition of concepts

For the purpose of this study, the following terms are defined as follows:

2.2.1 CAPM (Capital Asset Pricing Model)–is defined by Moosa (2013) as a model used to estimate the cost of capital, evaluate portfolio performance and for investment purposes. This is almost a replica of the Fama and French (2004) definition which says the model is used for estimation of cost of capital and evaluating managed portfolios. This study defines the model as one developed to estimate stock prices on a market using risk based concepts as alluded to in Fama and French (2004). The model relies on the assumptions of the random walk theory and the efficient market hypothesis which are both cornerstones of the model.

2.2.2 Accounting indicators - also referred to as accounting variables/parameters are said to be performance indicators and are defined as measures of value added to shareholder's wealth by the firm, Gupta (2014). Here, they are defined as ratios and other key accounting based performance indicators.

2.2.3 Accounting relevance – also referred to as value relevance of accounting information is defined as the link between corporate disclosure of accounting information and firm value (Bokpin, 2013). In this study, in keeping with this definition, it simply refers to the ability of accounting indicators to explain movement in the stock price.

2.2.4 Stock/share prices – is defined by the NSX as a good indicator of performance (NSX, 2015), it may also be defined as the closing value/price at the end of a period under review (Marr, 2012). For the purpose of this study it is the market value per share of shares of a company listed and trading on the NSX for the period under review.

2.2.5 Stock exchange – as defined by the NSX (2015), the stock exchange is a marketplace for the trading of financial securities such as equities and bonds. Similarly, Bodie et al. (2014) define stock exchanges as secondary markets where issued securities are bought and sold by members. For this study, a stock exchange is a capital market in a country's financial system that is used to channel funds from investors (shareholders) to lucrative investment opportunities (listed firms).

2.2.6 Investor (shareholder) – defined by the Bank of Namibia as one who avails funds for investment (BON, 2016). For this study, an investor or shareholder is an individual or institution which makes funds available as equity for investment.

2.3 Theoretical framework

A theoretical framework is the basis or perspective from which researchers conduct a study (Sitwala, 2014). This study is informed by a theoretical framework grounded in theories of financial modeling, specifically those theories on returns and capital market performance. The risk associated with an investment is fundamental to expected returns; investors thus attempt to set risk off against the return generated by an investment as they choose among alternative investments. The risk versus return concept is linked to value generated by a firm and its agents; such value is measured using the stock price as an indicator of return or reward to the investor. And so, a model using risk as a yardstick to gauge expected return may seem superior to one that does not (Sala, Nebot & Alquezar, 2012).

The choice of such model and the factors which are considered in choosing between models are both concepts embedded in the financial modelling construct, which forms the basis for this study. The development of these concepts further, leads to an election of either fundamental or technical analysis (Wafi, Hassan & Mabronk, 2015). The former being the use of financial statement information to explain movement in the share price and the latter as the use of past share price behavior to explain future movement in the share price (Chen, Lee & Shih, 2011). Arguments have been made for both sides, it should be noted however, that hybrid methods which combine fundamental and technical analysis are being explored as well (Bettman, et al., 2009; Chen, et al., 2011).

2.4 The critical role of stock markets in Africa

Africa has seen rapid development in its stock markets in past years as alluded to by Yartey (2007), in a study of several African stock markets over a ten year period (1991 – 2001). During that time, most African stock markets saw significant growth and doubled their market capitalization. This significant growth does not mean that African stock markets are mature; on the contrary, they suffer from low liquidity. And, in most markets trading only occurs in a few stocks which account for a substantial part of the market capitalization (Ntim et al., 2011). Although some are still small and underdeveloped based on their market capitalization (Okeahalam & Afful, 2006), this is not the case for all as the Johannesburg stock exchange for example, is the largest and most advanced in Africa.

This stock market showed a total market capitalization exceeding 50% of all stock exchanges in Africa (Yartey & Adjasi, 2007). The stock market is and will continue to be a catalyst for economic development in Africa and the world over. This has been pointed to in various studies, one being on two emerging Asian markets, by Ahmad, Khan and Tariq (2012) in a comparative study between Pakistan and Bangladesh. The researchers used charts and tables of market capitalization, liquidity and volume as independent variables against GDP per capita as the dependent variable for the period 1990 to 2009. They employed regression analysis and found that market capitalization was associated with economic growth in Pakistan. For Bangladesh however, economic growth is influenced by volume of trading on the stock market, these differences can be explained by sectoral dynamics in each country's economy.

Another is a broad study by Ngare, Nyamongo, and Misati (2014) covering a panel of 36 countries in Africa, of that number, 18 countries had stock markets. The researchers used panel data analysis techniques to uncover the relationship between stock market development and economic growth. The study covered the period 1980 to 2010 and found that stock market development has a positive effect on economic growth during that time. This is in keeping with what was found in another study with a smaller scope, covering three countries namely, Nigeria, Ghana and Kenya. This study employed a Ganger Causality test using data from 1989 to 2009 and found a two way relationship between stock market development and economic growth in Kenya (Osamwonyi & Kasimu, 2013).

The link between the stock market and economic development in African and other emerging economies has been established. African countries are focused on strengthening their stock markets in a region plagued by risk, illiquidity and underdeveloped institutional environments (Asogu, 2013). The lack of sophistication in African stock markets is a problem mentioned in earlier works by Abekah (2005) as the reason why calculated beta may not capture the appropriate risk or volatility of stocks. This study was done on the Ghanaian stock exchange and used accounting indicators as an alternative to beta and emphasized further that: "Accounting reports are intended to provide information that is useful to those making investment and credit decisions and thus helps to ensure the efficient allocation of financial resources" (Abekah, 2005, p. 19).

Another study employing this alternative technique used a panel analysis on 47 firms and accounting ratios in the emerging Greek stock exchange (Alexakis, Patra & Poshakwale, 2010). It found the important role of accounting information in reports, with the effect of improved investor confidence and enhanced investor participation. Appropriate and full adoption of accounting standards also enhances the credibility of the emerging stock market which then leads to economic growth. Such growth results from additional investment brought by the stability apparent in the financial system; as the stock market develops. This relationship is reported by Othman and Kossentini (2015) in a study that employs a panel model over 50 stock markets in developing countries and covers the period 2001 to 2007.

These results present a lifeline to Namibia as the country attempts to develop and deepen its financial system. As part of this process, the Namibian government through the Ministry of Finance (MOF) and other key players have devised a National Financial System Strategy (NFSS) which is a blueprint for an efficient, effective and stable financial system which makes a meaningful contribution to the national economy (MOF, 2011). As a part of that financial system, the stock market is expected to reach a high turnover, greater liquidity and a market capitalization of up to 75% of GDP. Currently that figure stands at 20% and although it has shown steady growth up to this point, it is a reflection of the local capital market in Namibia is shallow and illiquid (BON, 2015).

In response to these expectations, the NSX has put expansion plans in place, embarking upon initiatives to diversify the market, increase volumes traded, increase market capitalization and liquidity. This is being pursued by creating additional trading platforms and variations in the number and type of financial instruments available on the stock exchange (NSX, 2015). As Namibia aims to deepen its financial system through a robust stock market, a look at the factors affecting stock prices will contribute to this national objective. Additionally, modelling and subsequent understanding of the relationships that exist, if any, will enhance the analysis and results of this study.

2.5 Factors related to stock market returns

Studies in emerging and developing markets which include some on Namibia have discovered relationships between stock prices and a multitude of factors. Most of the research is focused on the relationship between stock prices and economic indicators, thus adopting models and theories grounded in economics. In a 2006 study of seven African countries, Adjasi and Biekpe (2006) highlighted the co-integrated relationship between interest rates and market returns. This relationship according to their analysis exists due to competition between interest bearing debt securities and stocks on the stock exchange, this was analyzed using co-integration tests.

Eita (2011) using Arbitrage Pricing Theory (APT) as an alternative to the CAPM to model stock price behavior found an inverse relationship between stock market returns and inflation as well as interest rates in Namibia for the period 1998 to 2009. This paper places more emphasis on the significance of the relationship between the stock market, its returns and economic indicators. The same study also discovered real GDP to be useful for predicting stock market returns. This finding is similar to what Akosah (2016) reported on the Ghana stock exchange in the short and long term using econometric models for the period 2000 to 2014, except the relationship to inflation which in that study was contrary to that found in Namibia.

Ghana was the subject of another study on stock market development and economic growth which in this case included both Kenya and Nigeria. The study by Osamwonyi & Kasimu (2013) uses the Granger Causality test to investigate the existence of and direction of causality between the two variables; various stock market indicators and GDP were used over the period 1989 – 2009. Findings of the research show that a causal relationship is found in Kenya and not in Ghana and Nigeria. Aregbeshola (2016) continues to investigate the relationship between financial markets and economic growth in a study of three African regions using a panel environment. It gave results that show a stronger relationship between the two variables in North and West Africa than the relationship in Southern Africa. This study encourages these economies to further develop their financial markets and so foster economic growth.

Another study of micro and macro-economic variables and their effect on stock market returns was done on the Nairobi Stock Exchange (NSE) in Kenya using monthly data of 20 firms spanning the period 2006 to 2010 (Ondiek & Ongoro, 2016). The study adopted a regression model applied to market return, risk-free rate, exchange rate, industrial growth opportunity and inflation as independent variables which showed varying relations to the company's individual return (the dependent variable). These findings would have implications for government, regulators and investors. In all, these studies concur to what Bodie et al. (2014) mentioned when they pointed to the fact that fundamental analysis on its own is not sufficient to explain stock price movement, in essence. A researcher should consider other factors (size, information, industry, national and even the global economy) all of which have a substantial effect on firm and stock value.

Having acquired a clearer idea of the important role of the stock market and the two-way relationship it shares with economic growth. It warrants further investigation into the way finance explains movement in stock prices, more so in developing economies.

2.6 Modelling share prices: The Capital Asset Pricing Model

In the continued quest to understand the financial market and specifically the movement of share prices on a stock exchange, finance research has produced several models. Chief among them is the CAPM which subscribes to the construct of technical analysis in application. This model has been used for decades in finance to model stock prices behavior inter alia, and its continued use has come under heavy criticism for its so called unrealistic assumptions.

In an overview of the Capital Asset Pricing Model, Fama and French (2004) presented theory and empirical evidence regarding the strengths and weaknesses prevalent in this model. According to that study, weaknesses of the model may be in theory or in its empirical implementation (failures in empirical tests). This then implies that most applications of the model are invalid. Primarily, this model assumes all variations (differences) in expected returns are explained by beta. But, later empirical studies have challenged this notion such as Lai and Stohs (2015) who did it through a review of the theories and mathematics of the CAPM and recommend that the short comings of the CAPM pose concerns to be explained by alternative models with alternative variables.

As an antidote to the flaws inherent in the CAPM, researchers attempt to modify the model by exploring relationships between stock prices and accounting based variables. Alternatively, they used modified versions of the model as was done by Delen et al. (2013) in Turkey, Kajola, Adewumi and Oworu (2015) in Nigeria and Paliwal (2011) in Namibia. The CAPM, although found to be wanting in some cases, is a useful tool when the conditions required to apply the model are present, Levy (2008). This researcher advocates for the model by using empirical tests to show that the model holds with actual parameters as the study attempts to answer to some of the major criticisms of the model.

In yet another critique of the CAPM, Moosa (2013) stipulates how the model, its variations and underlying theories such as the EMH have failed. This failure is exacerbated by the use of econometrics to treat finance as a science rather than trying to learn from financial history and other social sciences. Alternative theories grounded in behavioral finance persist as they attempt to explain the decisions made by the investor which do not follow the rationality principle.

A discussion of the roles different methods play in explanation of financial behavior and an outline of the origins of behavioral finance by Muradoglu and Harvey (2012), sets the tone for these theories. This concept has its roots in economics as Keynes (1936, 1937 as cited in Baddeley, 2013) and combines economics, psychology and finance to help explain irrational investor behavior. Such behavior may fall outside the norms of an efficient market hypothesis and the random walk theory both of which are cornerstones of the CAPM.

In a study on the Johannesburg stock exchange, researchers found that statistical techniques, specifically multivariate factor analysis (Chimanga & Kotze, 2009) give a better forecast of returns generated on the exchange, than would be using the CAPM. In another study of the same market using a non-parametric approach, Mwamba (2011) discovered that this approach yields results superior to a random walk model which is an underlying assumption of the CAPM. In an analysis of profitability, seasonality and reversibility of stock prices in the NSE by Lishenga (2012), this was done by combining stocks into portfolios and tracking them for a given trading period. This study pointed out that future stock prices are in some way related to past patterns, events and behaviors which implies a level of predictability.

As part of an investigation of trading strategies on the Nairobi stock exchange, Lishenga (2012) discovered momentum and seasonality of returns which are contrary to the efficient market hypothesis - a pre-requisite of the CAPM. By advocating for these concepts rooted in behavioral finance, these studies identify with the successful application of alternative models some based on accounting information and its influence on investor decisions.

2.7 Modelling share prices: An alternative model

In pursuit of the best performing investments, investors use performance indicators as a basis for stock evaluation and portfolio selection. Accounting information and related disclosures are thus gaining more relevance as the financial statements are a historical reflection of how the firm is performing and an indicator of how they are likely to perform Marr (2012).

The APT is a model that was proposed as an alternative to the CAPM and is founded on the assumptions of a perfectly competitive capital market which is also without friction. This was referred to in a review of the conceptual framework of asset pricing models done by Javed (2010) and it is apparent that its assumptions do not apply to a developing stock market.

As a better fit, for small, developing and emerging stock markets, accounting based models are proposed as they may be more suited due to their simplified application and readily available information. This was demonstrated in a study of two Latin American stock markets which analyzed stock price reactions to accounting information using multivariate regression analysis (Melgarejo, Montiel & Sanz, 2016).

Studies have documented earnings price ratios, size, debt equity ratio and book to market ratio (Rao & Sungandhi, 2011), as factors which explain returns in the share price that are not captured by beta (measure of risk). Thus, the literature concludes that unrealistic and even inapplicable assumptions and requirements cause empirical flaws in the CAPM. This gives evidence confirming that factors other than beta are important in explaining market returns (Oppong, 1993 as cited in Rao & Sungandhi, 2011).

As such, accounting statements and indicators calculated from financial statements of companies are a good proxy as measures of firm performance and risk in underlying assets. This was pointed to by Pennman in a 2016 paper that explains the risk- reward relationship in lieu of accounting indicators, the focus was on earrings recognition in a theoretical review of the concept. The use of accounting based values to measure performance was not only explored by researchers in Africa but also in other emerging markets specifically, it was done by Delen et al. (2013) in a study of Turkish companies listed on the Istanbul Stock Exchange. These researchers used decision tree analysis to relate financial performance (measured by stock prices) of firms to accounting ratios. They conclude that net profit margin is one of the most important relational variables.

In a study of a single company trading on the NSX, Paliwal (2011) established a positive relationship between Economic Value Added and the stock price of Namibia Breweries Limited. In that study, using multiple regression, the researcher also found an association between stock price and other accounting fundamental indicators such as earnings per share and net profit after tax. Another study by Kajola et.al (2015) employed a panel regression model and used the dividend payout ratio as the indicator of firm performance while Return on Assets (ROA) served as a substitute for firm value. The study found that there is a significant relationship between firm performance (change in value) and the dividend payout policy in Nigeria.

These studies show the value added by alternative models and more so those based on accounting information especially to stock markets with characteristics similar to the NSX.

2.8 Accounting relevance

Accounting information in financial statements is not only essential as per the requirements of the standards but it also serves the role of informing the current and future investor as they endeavor to make informed rational decisions. This was the assumption made and conclusion gathered by Magena et al. (2008) as they surveyed investors, using a questionnaire in the United Kingdom (UK). On the Abu Dhabi stock exchange, an emerging market, a study by Alali and Foote (2012) employed a three variable Ohlson return model. The researchers found that firms with quality accounting have a stronger association between stock prices and earnings and book values, this is because as the study reported, higher earnings quality has a positive effect on a firm's economic condition.

In another study based on the Athens stock exchange, using the same Ohlson model, a study found that the explanatory power of book values increased over time. For the period 1996 to 2008 the explanatory power of earnings appears to diminish over the last of those years. By presenting these findings, Glezakos, Mylonakis and Kafouros (2012) affirm what similar studies have concluded. Comparably, it is what this study hopes to conclude regarding the relationship between stock prices and accounting parameters/indicators, allowing for conclusion about value relevance of accounting performance measures.

Although this theory seems more suited to emerging markets, this is not entirely the case that it is only applied there as shown by Hussainey and Mouselli (2010). They used a three-factor Fama and French model on UK listed shares, to offer evidence of the usefulness of financial statement information to investors and they expand the model by adding disclosure quality as a factor of risk. Similarly, Habib (2010) also found value relevance of accounting performance measures in Australia using least squares regression. The study found the explanatory power of revenue was declining over the sample period which was 1992 to 2005 as it placed firms into large and small groupings for the analysis.

Another study in China used vast amounts of data covering the period 1999 to 2012 and panel regression to determine value relevance for a segmented emerging market, here, earnings per share and book values as the independent variables. Elshandidy (2014) found value relevance in the different segments of the Chinese market and more so in later years for those shares reporting under the International Financial Reporting Standards (IFRS). This shows further the reliance on accounting values regardless of the standards used to report these values.

In a study of the Ghana Stock exchange, Bokpin (2013) also uses the Fama and French model on 27 firms from 2003 to 2008 to determine the value relevance of accounting numbers produced by corporate reports on that market. The study found some positive relationships although some were not statistically significant. Similarly, Nyabundi (2013) conducted a study in Kenya for the period 2005 to 2011 spanning across firms listed on the NSE. The researcher used panel regression analysis and found significant proportional relationships between the share price and earnings, dividends and book value. These findings led to conclusions about the value relevance of accounting information on that market, although, it was concluded from the information asymmetry perspective.

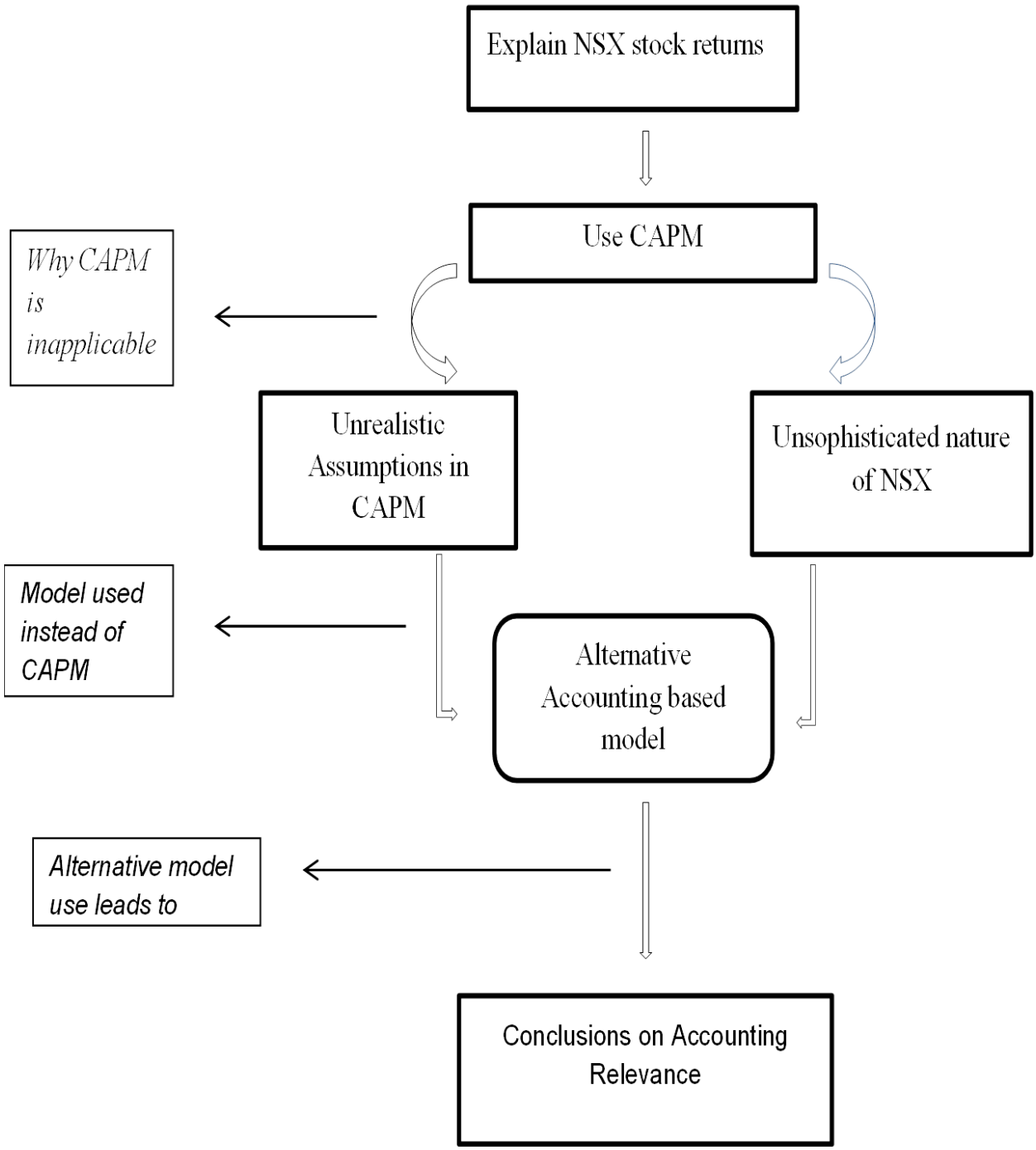
The determination of the relationship between share price and accounting indicators, the model it yields and the subsequent conclusions about accounting relevance on the NSX are in themselves all unique contributions to the body of knowledge in accounting and finance. Together these features form a peculiar empirical thought process for current and future research in this field, most particularly for small markets in developing economies.

2.9 Conceptual framework for the study

In understanding the problem for the study, it came to light that the problem could not be explained by one theory and that triggered the need for a conceptual framework as defined by (Sitwala, 2014). In this study, the CAPM is criticized and an alternative model is suggested and developed to suit a developing capital market.

The NSX is small, underdeveloped and illiquid as mentioned by Hearn and Piesse (2013) hence the application of an alternative accounting based model for evaluation of stock performance. Moreover, investors in emerging and developing markets have very little information and thus. It is expected that publicly available accounting information is value relevant to them given their limited options. This value relevance of accounting information will be proven by the existence of a positive relationship between the share price and accounting indicators on the NSX.

Figure 1: A diagrammatic display of the conceptual framework



2.10 Conclusion

The literature has made the case for more research on stock markets, more so in developing/emerging economies. Due to their unique features, African economies present market anomalies which in turn require an approach in line with behavioral finance more than an efficient market hypothesis. This study essentially contributes to literature in two ways, firstly it estimates the relationship between accounting indicators and stock prices and in doing so, it continues on to make a proposition about the value relevance of accounting information on the NSX.

The review of the literature gave a comprehensive understanding of the need for a study of this nature in a Namibian context, the next chapter presents the methodology used to achieve the objectives of the study as outlined in Chapter one. This study requires a quantitative approach and panel regression is used to analyze data which entails stock prices as the dependent variable and accounting indicators as the independent variable.

CHAPTER THREE METHODOLOGY

3.1 Introduction

This chapter is a description of the methods and instruments used to conduct the study. It presents the philosophical assumptions which served as a basis to the researcher in a quest for knowledge. The different sections outline the methodologies and models employed in an attempt to achieve the objectives of the study.

3.2 Research design

The research design is informed by underlying assumptions about truth and how knowledge is created, this view-of-the-world assumption is the paradigm or philosophy within which the researcher conducts the research. A research design as Creswell (2014) defines it is a form of inquiry within the specific research approach that suits the nature of the study.

In this regard, the study adopts a post-positivist paradigm which does not view truth and the ability to measure it as absolutes Mackenzie and Knipe (2006). This becomes apparent as the researcher attempts to determine the nature of an existing relationship among variables through a quantitative approach.

A non-experimental quantitative design is adopted, this is suitable because the researcher observed the subjects in the study and not treat them in any way, Creswell (2014). Such observation followed a correlation design as the study sought to measure the relationship between share price (the dependent variable) and six independent variables, which are sales, net profit, return on assets, market value, earnings per share and dividends per share.

3.3 Research philosophy

The philosophical standing in terms of what is truth and how it is determined is a simplified way to define what a research philosophy is.

In social sciences the philosophical paradigm is divided into three main categories of world views, these are constructivism, positivism and post-positivism (Aliyu, Bello, Kasim and Martin, 2014). As stated by Aliyu et al. (2014) positivist paradigm is a research paradigm that is rooted on the assumption that reality and truth are objective and quantifiable. This study leans itself towards a post-positivist worldview, which is a modified positivist paradigm and assumes a critical objectivity and measurability of truth.

In following this paradigm, the researcher did not assume the object of inquiry to be measurable with complete accuracy due to the interplay of several factors. Although, the variables are recorded quantities, the relationship between them which is the subject of research/inquiry could not be assumed or measured absolutely (Mackenzie & Knipe, 2006).

3.4 Research strategies

In business, strategy is referred to as the adaptation of plans to a specified objective. In business research, strategy is the planned approach deployed by the researcher in collecting and analyzing data in order to meet the research objectives or answer the research questions (Sharma, 2008).

The strategy adopted for this study was an initial survey of literature on financial markets in emerging economies and was prompted by the researcher's interest in a topical issue that combines theories in accounting and in finance. This survey unveiled the possibilities for alternative model development and the value relevance of accounting information which could be ascertained from a study of this nature.

This study was pegged on a study done in Ghana by Abekah (2005) that stressed the need for accounting based models to help explain variations in share prices in that country's stock market given the inapplicability of other models. In addition, another study done in Kenya by Nyabundi (2013) used a panel to determine accounting relevance on the NSE employing dividends, earnings and book values to explain the share price on that market. These main studies among others; helped the researcher synthesize the theoretical framework for this study. There were few studies which fit into the objectives of this study and as a remedy, the researcher developed a conceptual framework to help resolve the limited theoretical backing from existing literature. Such framework was to combine the main objectives of these two studies and add to them the development of a model that could be applied to the NSX.

3.5 Research population

The population of the study is a complete set of all participants which meets the definition as per the research conducted, which definition relates to a set of characteristics found in all participants (Zikmund, Babin, Carr & Griffin, 2013).

The population for this study entails 32 companies listed on the NSX up to 2013, which trade in five industries namely, Basic Materials, Industrials, Consumer Goods, Consumer Services and Financials. Data was collected for 10 years, and is expected to provide sufficient data values and strong empirical evidence which can then be generalized over the population.

The definition of the population is construed by new listings and delisting during the term of the study but for any firm trading on the Namibian stock market, such activity is sufficient connection to the results to allow for generalization. This is supported by the fact that companies on the NSX will adhere to the same regulations relating to reporting of accounting information.

3.6 Sampling Procedure

A sample is a subset of the population which indicates those participants who part take in the actual research (Zikmund et.al, 2013) and the sampling procedure is the process adapted when choosing the actual sample.

Non-probability sampling is a sampling method where the participants of the study are selected in a manner that is not random (Dudovskiy, 2013). Quota sampling method, which allows the researcher to set a criterion for selection was used as the study had a specific requirement that the companies included are listed for 10 years. This requirement was necessary to ensure sufficient data values and a trend that could be analyzed for observation and generalization onto the population.

The sample is drawn from a sampling frame of 18 companies which were listed for the duration of the period proposed for the study (2004 to 2013). This period was purposely chosen as it represents a period with a good number of listings on the NSX. This will escalate available data and enhance the analysis. Out of the 18 firms listed during that time, only a sample of 13 could be used as some financial statements were not readily available or companies would not release them.

The following table shows the companies selected:

Table 1: NSX companies which qualified for the sample

COMPANY NAME	CODE	LISTING DATE	DUAL LISTING
1. NICTUS	NCT	19-Oct-92	JSE
2. STANDARD BANK GROUP	SNB	9-Dec-92	JSE
3. AFROX	AFX	28-Feb-95	JSE
4. NAMIBIA BREWERIES	NBS	2-May-96	NO
5. BARLOWORLD	BWL	11-Sep-96	JSE
6. FNB NAMIBIA	FNB	27-Mar-97	NO
7. FIRSTRAND	FST	26-May-98	JSE
8. NAM. HARVEST INVESTMENTS (Namibia Asset Management limited)	NHT	22-Jul-98	NO
9. TRUWORTHS	TRW	6-Oct-98	JSE
10. SANTAM	SNM	16-Nov-98	JSE
11. ANGLO-AMERICAN	ANM	4-Jun-01	JSE
12. SHOPRITE HOLDINGS	SRH	25-Oct-02	JSE
13. ORYX PROPERTIES	ORY	4-Dec-02	NO

3.7 The research instrument

The research instrument is the tool that is used to measure the behavior of research subjects, from this tool the researcher collects scores which lead to conclusions about the theories presented for analysis (Creswell, 2014). Due to the nature of the study and the characteristics of the data, this is a desktop study with data being obtained from published sources on the NSX database. Additionally, data was obtained from annual reports published on company websites or hard copies of listed companies selected for the sample. After such data is edited and coded into the appropriate format using Microsoft Excel, the data was imported into Stata®, an analysis software which serves as the research instrument for this study.

The following model was used to test the relationship between the dependent variable and several independent variables and the panel regression model and model specifications are as follows:

$$Share\ Price_{it} = \beta_0 + \beta_1 Sales_{it} + \beta_2 NP_{it} + \beta_3 ROA_{it} + \beta_5 MV_{it} + \beta_6 EPS_{it} + \beta_7 DPS_{it} + \varepsilon_{it}$$

Where,

it = are the indices for individual and time

$Share\ Price_{it}$ = the dependent variable

β_0 and β_1 = coefficients

The independent variables are

Sales (Turnover) = $\beta_1 Sales_{it}$, Net profit = $\beta_2 NP_{it}$, Return on assets = $\beta_3 ROA_{it}$, Market value = $\beta_4 MV_{it}$, Earnings per share = $\beta_5 EP_{it}$, Dividend per share =$\beta_6 DP_{it}$ and

ε_{it}= Error term, which captures the variation in the dependent variable that is not explained by the independent variables.

The accounting indicators used were selected based on their popularity as measures of profitability (Sales and Net profit) asset turnover (Return on assets), firm size (Market value) and return to shareholders (Earnings and Dividends per share). These being key performance indicator categories, which represent value to shareholders and firm value (Marr, 2012).

The investigation was on the effect of accounting indicators (independent variables) on the share price (dependent variable) and the following procedure was adopted to determine values for the various accounting indicators:

Sales (Turnover): The Namibian dollar amount reported in the financial statements.

Net Profit (Earnings): Reported in the financial statements as the difference between gross profit and operating expenses (including interest and tax).

Return on assets: Calculated as Net profit divided by average assets.

Market value: Calculated as the share price multiplied by ordinary shares outstanding, this was used as a proxy for firm size. (A proxy was required as book values gave extreme values for some firms and market value showed more consistency).

Earnings per share: Calculated as Net profit divided by ordinary shares outstanding at year- end.

Dividends per share: Reported in the financial statements or calculated as ordinary dividend paid or payable at year end divided by ordinary shares outstanding.

The share price used was the closing price at the end of the period as this represents the best value placed per share on the company by the market at that point in time. The figures produced from these calculations were fed into the software and from there the researcher could collect the results necessary to make conclusions on the objectives of the study.

3.8 Procedure

After proposal approval and ethical approval, the process of data collection started with the acquisition of share prices and historical data on listings and delisting's of companies traded on the NSX. This was followed by selecting a sample and study period based on listings that had survived a 10-year period which combination would avail the largest number of observations. A higher a number would lead to greater reliability and thereby enhance the results, the period so selected was 2004 to 2013 and this yields a sample of 13 companies, as seen in Table 1 above.

The next step was to collect financial statements of companies in the sample, this proved to be the biggest part of the data collection process. Some financial statements were readily available online and others where only hard copies with others still being unavailable at all. This reduced the number of companies eventually taking part in the study from the 18 in the sampling frame to only 13. There was some missing data among those, producing only 118 observations instead of the 130 expected. Data was then captured, edited and coded into a format and a program that was conducive for its analysis, all this was done using Microsoft Excel.

3.9 Data analysis

Data analysis is the application of a suitable tool of analysis to raw data in order to deduce meaning from it in the form of results which allow statistical inference and produce empirical evidence to proof or dispute a theory or hypothesis (Van Zyl, 2014).

In this study, the researcher organized and transformed raw data into a format that allowed computation of the accounting indicators using Microsoft Excel. The panel was then analyzed using Stata® to complete the regression which then produced, descriptive statistics, variance inflation factors, coefficients and p-values for the variables, inter alia. These are related to the objectives and a discussion of how they may be generalized ensues.

3.10 Validity and reliability

In order to ensure the credibility of the research process and the results obtained from it, the concepts of validity and reliability hold testament to the ability of any researcher to reproduce the same results under similar conditions. These concepts encapsulate the need to follow the scientific research method as the researcher conducts the process that will yield results and subsequent conclusion (Dudovskiy, 2013).

Some other studies of this nature have employed multiple regression analysis and used the Coefficient of Determination (R^2) to investigate the relationship between specific accounting indicators and stock prices of firms traded on a stock market. For the purpose of this study however, a panel model was employed. Characteristics of the objects under inquiry were such that the data was longitudinal, and the panel model yields the most useful results. The unit root test and a test for goodness of fit between the data and the model used were conducted to enhance the validity and reliability of the results from analysis.

3.11 Limitations of the study

In conducting research, there are shortcomings in the design, procedure and process; these flaws need to be reported as they may influence the validity and or reliability of findings. The researcher should also then indicate how validity and reliability is not affected by these drawbacks (Cooper & Schindler, 2011).

In this study, a significant drawback of the NSX was that most listed companies were not local and did not report separately on their Namibian operations, this made it generally difficult to conduct and conclude a study from a truly Namibian perspective. However, the significant role played by these multinationals on local industry and the economy at large was enough to warrant their inclusion.

The study originally planned to assess eight independent variables as follows: sales, net profit, return on assets, market value, book value, earnings per share, dividends per share and finally economic value added. However, due to limited data available, specifically required for the computation of cost of capital used to estimate economic value added, this variable fell out of the study. Another variable; book value gave extreme values for some firms which would distort the results, it then had to fall out of the study also, this reduced the independent variables for regression to six.

The limitations encountered in data collection as far as availability of financial statements, meant the panel was unbalanced in that the number of groups did not match the data available for the number of periods given, fortunately Stata® could still analyze the data even with these missing figures. Another daunting restriction was the availability of relevant literature that speaks to the specific objectives of the study. This limitation was overcome with a dedication through persistence to the best possible outcome by the researcher, while acknowledging the humbling scope of the study given its application of previously unfamiliar concepts and models in econometrics.

3.12 Elimination of bias

Bias in research is defined as a systematic error introduced into the study by prejudice from the researcher at any point from sample selection to interpretation of findings, bias needs to be eliminated as it causes inherent error in the study as a whole (Sharma, 2008). The quantitative nature of the study and the pre-existing data values which are generated by companies and institutions required little interference and influence from the researcher. Data analysis was done using the most appropriate tools which present dependable results. This was sufficient to ensure little to no bias in the study.

3.13 Ethical considerations

Ethics are acceptable norms and standards of behavior which administer the way members of a society interact with one another (Cooper & Schindler, 2011). In research, the emphasis of research is to ensure that no harm comes to participants and the credibility of findings is maintained. The researcher maintained integrity, respect, beneficence and non-maleficence, throughout the research process.

Recognition of the researcher's responsibility toward scientific validity and peer review as set out in the University of Namibia's research ethics policy was given. This was done through consultation with qualified superiors and peers (UNAM, 2013).

The need to adhere to moral standards, transparency and internationally acceptable ethical guidelines in business research was recognized and upheld. The researcher did not fabricate or falsify data and or results that might infringe on any intellectual property rights. All sources used were cited and referenced appropriately.

3.14 Conclusion

In all, this chapter broadly described the methods and processes adopted in order to carry out the study in its entirety from the research philosophy down to ethical considerations, capturing everything else in between. Chapter four presents and discusses the results from the analysis described here in lieu of the objectives of the study which were presented in Chapter one and affirmed in Chapter two.

CHAPTER FOUR PRESENTATION AND DISCUSSION OF FINDINGS

4.1 Introduction

The results produced by the methodology employed for the study as described in the previous chapter are discussed in this chapter. The chapter is segmented into the following sections, 4.2 gives a description of the characteristics of the NSX and of companies which were sampled from it, for the study. Section 4.3 presents findings as per the objectives of the study, 4.4 is a discussion of these findings, also in lieu of said objectives and the last section which is 4.5 concludes the chapter.

4.2 Demographics of selected companies and variables

The NSX is the only stock exchange in Namibia, it was founded in 1992 and is registered as a non-profit organization under Section 21 of the Companies Act 28 of 2004. The exchange trades on a primary and secondary platform as well as an over-the-counter market which hosts smaller firms who are unable to list on the main/primary platform raise capital. This main exchanges focus of this study as it offered more data and a greater population for generalization of findings.

As of December 2013, the last year of this study, the stock exchange had a total listing of 32 companies trading across six industries, the market has seen a good amount of growth as the volume of shares more than doubled between 2012 and 2015 (NSX, 2015). The NSX is a diverse market in that it trades various types of financial instruments, namely, shares, bonds (public and private sector) and has in recent times created a Central Securities Depository (CSD), the first of its kind in Namibia to allow the trading of more sophisticated instruments such as derivatives and to formalize the current market for bonds.

The demographics of companies selected for the study are presented in the table below:

Table 2: Demographics of listed companies

COMPANY NAME	CODE	LISTING DATE	DUAL LISTING	INDUSTRY
1. NICTUS	NCT	19-Oct-92	JSE	GENERAL RETAIL
2. STANDARD BANK GROUP	SNB	9-Dec-92	JSE	BANKING
3. AFROX	AFX	28-Feb-95	JSE	CHEMICALS
4. NAMIBIA BREWERIES	NBS	2-May-96	NO	BEVERAGES
5. BARLOWORLD	BWL	11-Sep-96	JSE	SUPPORT SERVICES
6. FNB NAMIBIA	FNB	27-Mar-97	NO	BANKING
7. FIRSTRAND	FST	26-May-98	JSE	FINANCIAL SERVICES
8. NAM. HARVEST INVESTMENTS (Namibia Asset Management limited)	NHT	22-Jul-98	NO	FINANCIAL SERVICES
9. TRUWORTHS	TRW	6-Oct-98	JSE	GENERAL RETAIL
10. SANTAM	SNM	16-Nov-98	JSE	INSURANCE
11. ANGLO-AMERICAN	ANM	4-Jun-01	JSE	MINING
12. SHOPRITE HOLDINGS	SRH	25-Oct-02	JSE	FOOD & DRUG RETAILERS
13. ORYX PROPERTIES	ORY	4-Dec-02	NO	REAL ESTATE

The first column is the name of the company, the second is the code used as shorthand by the NSX, and the third column shows the date the company was listed on the stock exchange. The mode of listing (dual or single; the company is listed on the NSX as well as the JSE) is shown in column four and finally the industry within which the company trades is in the last column.

The first criterion for selection was the length of time the company has been listed (whether it fell in the ten-year period of the study: 2004 - 2013). The second criterion was the availability of financial statement data during that period; this was an important criterion as it determined the amount of missing data in the panel. The share price, although an important variable, was not a criterion as those were readily available from the NSX.

Financial statement data was used to compute the values of the accounting indicators, which were the independent variables and these, along with the share price, showed the following statistical characteristics:

Table 3: Descriptive statistics of variables

Variable	**Observations**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Share price	118	52.04051	67.65161	0.17	345.43
Sales	118	1.75e+10	2.11e+10	2.35e+07	9.27e+10
Net profit	118	2.49e+10	4.05e+09	-1.51e+09	2.15e+10
ROA	118	0.0722627	0.932431	-0.012	0.736
Market value	118	3.03e+10	7.11e+10	3.40e+07	4.17e+11
Earnings per share	117	3.887991	4.872406	-5.25	19.874
Dividend per share	118	3.271398	6.643543	0	35.002

Based on the number of companies selected for the sample, the study was meant to have 130 observations (13 subjects over 10 periods). This is clearly not the case, the average number of observations id 118 from Table 5 above, pointing then to (130 – 118) 12 missing observations on average, this is a result of some missing financial statement data and did not affect the credibility of the analysis.

As for the descriptive statistics, the mean shows the average value of the variable in question, the standard deviation is a measure of dispersion which shows how much values differ from the mean. The minimum and maximum show the lowest and highest value observed, respectively, these statistics from the data are within acceptable ranges.

Additionally, a unit root test was carried out on the data to test the stationarity of the panel data, which tests how the data responds to shocks and represents stability in the data. For the study, there were no unit roots; which means the data is stable. Given the acceptable statistics and stable data, the regression that ensued produced findings which are now presented according to the objectives of the study.

4.3 Presentation of findings

4.3.1 Findings on objective 1

The first objective of this study was to understand the nature of the relationship between specified accounting fundamental indicators and share price over a ten-year period, in stocks listed on the Namibian Stock Exchange. This ten-year period was 2004 to 2013 and during that time, the following relation emerged from an analysis of the relationship between share prices and financial key financial indicators of the 13 companies selected for the study.

The results of the panel data regression using Stata® produced coefficients for each of the independent variables which measure the change effected on the dependent variable by a change in each of the predictor variables, the coefficients produced and their corresponding p-values were as follows:

Table 4: Coefficients of independent variables and p-values

Independent Variable	**Coefficient**	**P Values**
Sales (Turnover):	0.000000000605	0.000
Net Profit (Earnings):	-0.000000000804	0.000
Return on assets:	1.19	0.969
Market value:	0.0000000009	0.000
Earnings per share:	6.503085	0.000
Dividends per share:	1.925207	0.001

The coefficients of independent variables are reproduced in the preceding table, Table 4, along with their corresponding p-values; the p-values illustrate the significance of the coefficient produced from the regression. A p-value of less than 0.005 indicates that the variable and its corresponding coefficient have a statistically significant relationship with the dependent variable at a 95% confidence level.

The results show that an increase of 0.000000000605 in sales, there is a resultant increase in one unit in the share price, with everything else held constant.

This is apparent from the coefficient produced in the analysis for sales and the corresponding p value which is less than 0.005 indicating a statistically significant relationship between these two variables and the independent variable can be used to explain some variation in the dependent variable.

The results for net profit are unexpected, it shows an inverse relationship to share price in that an increase of 0.000000000804 in net profit will result in a decrease of one unit in the share price, with a p-value of 0.000. The expectation is that, net profit follows the trend set by sales as the net profit results from sales, this did not happen here however although the coefficient is also statistically significant.

Return on assets shows a larger coefficient of 1.19 which would imply a greater ability to explain variation if it were not for the p-value associated with the coefficient of 0.969 making it statistically insignificant.

Market value has given a coefficient of 0.0000000009 which means a change of this much in market value causes a unit increase in share price, ceteris paribus. This is confirmed by the corresponding p-value of 0.000.

Earnings and dividends per share yield the highest coefficients of 6.503085 and 1.925207, both with statistical significance affirmed by p-values of 0.000 and 0.001 respectively. These variables have the highest abilities to explain variation in the share price and that could be a result of their close relation in that they are values per share.

Given the findings confirming the existence of a significant relationship between the share price and the explanatory variables, the researcher is now equipped to model this association in a useful way.

4.3.2 Findings on objective 2

The second objective was to develop an alternative model that will be used to explain the relationship between specified accounting fundamental indicators and share price in stocks listed on the Namibian Stock Exchange.

The data collected had longitudinal or two-dimensional characteristics; this means it was both cross sectional and time series data, thus yielding an econometric panel. The panel required the use of specialized software which is appropriate to analyze data of this nature, also a choice is granted in the analysis of panel data between a random effects and a fixed effects model. The choice between a random effects and a fixed effects model is made using the Hausman specification test, in this study, the test pointed towards a random effects model which is consistent with the assumption of individuality among variables and their effects based on the sample selected.

The relationship among the independent variables is measured to see the effect on the model in terms of its ability to explain relationships and to estimate the coefficients of the model. The VIF (Variance Inflation Factor) measures the relationship independent variables have with one another, this association among explanatory variables is known as multicollinearity (Zikmund et.al, 2013). From the data for this study, the table below shows the VIF and the tolerance factor denoted by (1/VIF) which is the inverse of the VIF.

Table 5: Variance inflation factor for independent variables

Variable	VIF	1/VIF	P- value
Earnings per share	3.6	0.277785	0.000
Net profit	2.97	0.336695	0.000
Dividends per share	2.73	0.366251	0.997
Sales	2.09	0.479580	0.000
Market value	1.77	0.565358	0.000
Return on assets	1.15	0.868382	0.336

The general rule of thumb is that a value of 10 for the VIF is considered too high and the correlation between the independent variable and the error term would be too high, (Joseph, William, Berry & Rolph, 2010). In the case of this study, the VIF was at an acceptable level and the model produced by these variables will be viable.

The p-values show whether the value and the variable associated with it are statistically significant; this value becomes more useful if there are values which exceed the given threshold which are not present in these results.

Additionally, the within R^2 (coefficient of determination) is used to measure goodness of fit of the model and the data, Moorad and Wade (2013). A value of .4 was deemed acceptable as the data was marred with high values and some missing data. A unit root test was also conducted for the share price and the result showed that the were no unit roots and the therefore the data was stationary, this means the data is consistent and not vulnerable to shocks, which allows continued reliance on the results and models produced from its analysis. The regression of the dependent variable against all independent variables gave the following output:

Table 6: Coefficients of variables with acceptable p -values

Independent Variable	**Coefficient**
Sales (Turnover):	0.000000000605
Net Profit (Earnings):	-0.000000000804
Market value:	0.0000000009
Earnings per share:	6.503085
Dividends per share:	1.925207

The output of the regression leads to the following model for the NSX:

Share Price $= 3.28 + 6.05e^{-10}Sales - 8.04e^{-09}NP + 9.00e^{-10}\text{MV} + 6.503\text{EPS} + 1.925DPS$

Where,

Share price = stock price (the dependent variable)

The following denotations refer to the independent variables shown with their coefficients in the model:

Sales = Revenue/Turnover, NP = Net profit, MV = Market value, EPS = Earnings per share. DPS = Dividends per share. 3.28 is the value for the constant which represents the estimated share price without contributions from any of the independent variables or when these variables are 0.

The model shows that the variables with the strongest positive relationship to that share price are earnings per share, dividends per share, market value and sales in that order from the strongest explanatory power to the weakest. Net profit on the other hand indicates an inverse relationship to the share price, which means a change in net profit causes a change in the share price in the opposite direction.

The model proposed for this study shows the ability of five accounting indicators to explain movement in the share price on the NSX; return on assets fell out of the model because its relationship with the share price was not statistically significant. These results still helped the researcher in ascertaining the value relevance of accounting information of companies listed on the NSX.

4.3.3 Findings on objective 3

The third and final objective of the study was to ascertain the value relevance of accounting information recorded by companies listed on the Namibian Stock Exchange. The value relevance of accounting information although a somewhat dependent finding; is still a very significant one and for the data that was analyzed on the NSX. The results show a positive relationship between the share price and five out of the six independent variables selected for the study, this positive relationship is suggestive of the accounting relevance of financial statement information for companies traded on the NSX.

Table 7: Correlation among variables

	Share price	**Sales**	**Net profit**	**ROA**	**Market value**	**Earnings per share**	**Dividends per share**
Share price	1.0000						
Sales	0.4445	1.0000					
Net profit	0.2399	0.4323	1.0000				
ROA	-0.0993	-0.2211	-0.2198	1.0000			
Market value	0.6767	0.3494	0.4522	-0.0697	1.0000		
Earnings per share	0.3912	0.2571	0.3591	-0.1434	-0.1170	1.0000	
Dividend per share	0.2978	0.1059	0.3475	-0.1725	-0.1025	0.7140	1.0000

The correlation that is important for the purpose of this study is that of the share price and each of the independent variables. A high correlation coefficient is an indication of a strong relationship between the said variables. The direction of such correlation is determined by whether the coefficient is positive or negative, the latter indicating an inverse relationship which the former shows a proportional association.

From Table 7 above, 5 (five) out of the 6 (six) variables show a positive correlation to the share price with the highest correlation being with the market value at 68%, this is followed by sales with a correlation of 44%. Earnings per share, dividends per share and net profit follow with 39%, 30% and 24%. Return on assets shows a negative correlation to the share price. These values are a more simplified explanation of the relationship between our dependent and independent variables. The coefficients used in the model give a more sophisticated explanation to that relationship by attaching actual values to the independent variables can be used to estimate the dependent variable.

The p-values as presented in Table 4 confirm the significance of the positive relationship between the share price and sales, market value, earnings per share and dividends per share as explanatory variables and thereby affirm the accounting relevance of the financial statements of companies selected for the study, this result allows for a generalization to the population of companies listed on the NSX.

The results of the correlation are a further indication of the positive associations between the accounting indicators and the share price, differences between these results and those of the regression are merely due to a one-dimensional analysis of the former and a two-dimensional analysis of the latter. The findings presented so far are in tow with the objectives of the study, the ensuing discussion of these findings places the study squarely into and next to existing literature on the subject matter(s).

4.4 Discussion of findings

4.4.1 Discussion on objective 1

The results of the data analysis show the relationship between the share price and the selected accounting indicators, the nature and strength of that relationship is different for each variable and a comparison is drawn among the various variables with what was found in the literature.

Measures of profitability

Measures of profitability are indicators of the firm's ability to generate returns in its quest for wealth creation for investors and in the interest of various stakeholders.

Sales (Turnover) produced a small but statistically significant positive coefficient which is an indication of a positive relationship between the share price and sales. This is consistent with the findings in Australia by Habib (2010) who found a positive but declining association there. These two relationships are comparable in terms of direction although the markets analyzed have stark differences.

Net profit is a very important accounting measure in that many stakeholders including investors rely heavily on it for inferences and decisions on the firm and its various components (Marr, 2012). The negative relationship seen in this study is not encouraging and it is consistent with findings in other studies such as those done by Delen et al. (2013) in Turkey, Nyabundi (2013) in Kenya and Paliwal (2011) in Namibia who all found positive associations.

Earnings per share is a measure of profitability which averages the firm's profit over the number of ordinary shares, in this study this relation was the strongest and is statistically significant.

This could be a result of the relative value to the number of shares which earnings per share and the price per share both are, this could explain why the significant relationship between the two variables was the strongest. A positive relationship was also found by Elshandidy (2014) in China and again by Paliwal (2011) in Namibia.

Measure of asset turnover

Measuring asset turnover indicates efficiency in the ability of the firm to transform total assets into real returns in the form of sales generated for assets invested in the firm (Du Toit, Erasmus, Kotze, Ngwenya, Thomas and Viviers, 2010). Return on assets measures asset turnover in this study and produced a positive coefficient although the relationship with the share price was insignificant. Although there is no specific study modelling the relationship between ROA and the share price, it is an important measure of firm value and it was used as such in a study by Kajola et al. (2015) in Nigeria.

Measure of firm size

Measuring firm size against the share price gives an indication of whether a greater investment in the firm is a prerequisite to growth in the firm shown in a growing share price. The results show a significant positive relation between the share price and market value which serves as a proxy for firm size in the place of book value. Studies mostly studied the relationship to book value and also found positive relationships found in China by Elshandidy (2014) and by Alali and Foote (2012) in Dubai.

Measures of shareholder return

Dividends per share

The real returns to shareholders are in the form of dividends which are paid to investors at given intervals and this payout is an important measure of value to investors and other stakeholders (Du Toit et al, 2010). For this study the relationship between the share price and the dividend paid to shareholders was a positive and significant one. This is not unexpected as it was witnessed by another study in Kenya by Nyabundi (2013).

The positive relationships found in this study are an endorsement to the essential role of accounting information as was discovered in a UK study by Magena et al. (2008) and this clearer understanding of the relationship between the share price and the specified accounting indicators, creates an opportunity for modelling that relationship in a useful way.

4.4.2 Discussion on objective 2

The product of the regression is a set of coefficients which translate into a model which may be used to calculate the value of the share price given a number of independent variables. The output of the regression leads to the following linear model for the NSX:

$$\text{Share Price} = 3.28 + 6.05e^{-10}Sales - 8.04e^{-09}NP + 9.00e^{-10}\text{MV} + 6.503\text{EPS} + 1.925DPS$$

The value of this model is in its simplified approach to a somewhat complex concept in financial modelling. The model employs regular accounting numbers in explaining share price behavior to various stakeholders who may appreciate the ease in understanding the model. This model is a contrast to the CAPM as described by Fama and French (2004) and Levy (2008) but serves as an alternative and may remedy some of its shortfalls as pointed to by Lai and Stohs (2015) and Paliwal (2011).

Confidence in the model is strengthened by the sophisticated tools used in its development and this helps the study draw a parallel between the related yet distinct fields of accounting and finance in a Namibian context.

As a caveat to using this model as is the case with many models and the limitations that come with their application to actual results, it should be noted that the model is a theoretical one developed from a limited, unbalanced dataset and the results may be affected by these characteristics in the data (Flannery and Hankins, 2012).

These limitations do not render the model futile but serve as a pre-requisite to the extent of its application and it is best applied with careful consideration of these limitations and assumptions including the consideration of other non-financial factors. Such a model sets the basis for other conclusions to be drawn regarding the relationship between accounting indicators and the share price, the conclusion of accounting relevance specifically.

4.4.3 Discussion on objective 3

This study set out to understand, model and thereby ascertain the relationship between the share price and accounting indicators. The relationship was explored to help make conclusions about the accounting relevance of information found in financial statements of companies traded on the NSX.

The positive association between accounting indicators and the share price is a reflection of the ability of accounting numbers to explain the share price, which in essence represents value creation for the shareholder and therein lays the importance of this relationship.

Researchers have had similar results in developed markets as seen in studies by Hussainey and Mouselli (2010) in the UK and Habib (2010) in Australia as well as others in emerging markets as found by Alali and Foote (2012) in Dubai, Glezakos et al. (2012) in Greece, Bokpin (2013) in Ghana and Nyabundi (2013) in Kenya, these discoveries lead to a verbatim believe in the continued reliance on accounting numbers.

For smaller less developed markets such as the NSX, discoveries of this nature create new systems which can be used for investment appraisal and portfolio allocation, concepts which relate to the decision making process of the seasoned or new investor.

The relationship discovered between the share price and accounting indicators is an indication of accounting relevance and that in turn shows an elevated level of sophistication and development in the NSX, the kind that Yartey & Adjasi (2007) referred to as a necessity to aid the growth of the African stock market.

Given the significant role of the stock market in the economy, the trickle-down effect into the Namibian economy of this development in the stock market cannot be ignored. Additionally, it can be seen that perhaps the NSX and its stakeholders have made strides in their continued quest to diversify and deepen the Namibian financial system as implied by the credibility associated with the stock market from the results of this study.

4.5 Conclusion

In Chapter four the findings of the data analysis were presented along with a mirror discussion of such findings as all were shown and discussed in relation to the study objectives they relate to. This gave a coherent sum of what the study brought forth and sets the tone for a summary of the study in its entirety. The next chapter explores the practical implications of findings presented here, makes recommendations for future research on this subject and draws final conclusions on the study as a whole.

CHAPTER FIVE IMPLICATIONS OF FINDINGS AND CONCLUSION

5.1 Introduction

After presenting and deliberating on the results of the analysis, this chapter outlines the implications of these findings and recommends areas for additional research. The chapter is divided into three (3) sections, 5.1 is a summary of the practical implications of findings in relation to each of the study's objectives, section 5.2 proposes areas for future research and the last section, 5.3 concludes the chapter and with it the entire study as well.

5.2 Practical applications and implications of findings

5.2.1 Practical applications and implications of findings for objective 1

The results of this study point to a relationship between the share price and accounting indicators and this creates enthusiasm about the practical implications of such a finding. It directly implies that accounting information of firms trade on the NSX is relevant and can be relied upon, although the question of how such information is reported (historic cost, fair value) and how such indicators are then calculated is still a topic of academic debate (Penman, 2016).

5.2.2 Practical applications and implications of findings for objective 2

The model developed from the results of the data analysis for this study is an example of how business research can be used to address practical questions for investors and other stakeholders on the NSX in this case.

A caveat is essential in the application of the model as it is not directly applicable on its own, as is the case with most models, but should be used to support decision making along with a variety of numerical and non-numerical sources of information.

The results seen from this study have regulatory implications as they point out the important role of accounting numbers on the local stock market and go on to proof that role with an explanatory model followed by accounting relevance. This means, regulators need to emphasize the timely, consistent and reliable release of accounting information on accessible platforms to current and potential investors on the NSX to ensure the market benefits from the accounting relevance of such information.

5.2.3 Practical applications and implications of findings for objective 3

This study immediately begs the question of how reliable (and relevant) accounting information presented in the financial statements of listed companies on the NSX is? There have been studies in other emerging markets with specific focus on such a determination and the findings of this study affirm reliability and relevance as proven by the ability of accounting indicators to explain variation in the share price.

This finding has the implication of encouraging current and future investors to trade on the NSX as they are now presented with a tool unavailable to them before. This tool is the addition of an accounting based model which they can use for investment appraisal and portfolio allocation.

Thus, the study by comparing accounting data and share prices inadvertently leads to results which allow the researcher to make an educated conclusion about the accounting relevance of information provided by companies listed on the NSX.

This conclusion of accounting relevance is an indication of some degree of growth and sophistication in the NSX. This shows development of the financial market and with it the country's financial sector; financial sector development has been linked to economic growth in Namibia (Mushendami, 2007).

Development and deepening of the stock market as a key component of Namibia's financial system cannot be emphasized enough, such emphasis is apparent in the stock exchanges' own vision and expansion plans (NSX, 2016)). The ministry of finance placed more emphasis on this with its blueprint for an efficient and effective financial system (Ministry of Finance, 2011). More recently, the country has shown a drive towards a resilient and robust financial sector in its latest National Development Plan (National Planning Commission (NPC), 2017). It is only befitting that academia makes its own contribution to this list in the form of applicable empirical research.

5.3 Recommendations and suggestions for further research

The historical nature of accounting financial statements may cause the information to have a limited long run application and this shortcoming signals the need for hybrid methods. Such which combine technical and fundamental analysis to be developed for small underdeveloped capital markets. Accounting based models should explore a myriad of variables which include different performance measures to create a continuous stream of empirical findings. Any empirical findings may support or dispute existing literature and thereby enhance contemporary theories in this field.

Studies can expand the literature on which accounting indicators hold the closest relationship to the share price and thereby increase the scope of possibilities for decision makers. This and future models should continue to test existing models in finance. Thereby ensuring a continued quest towards an adoptive and contemporary attitude among academics, regulators and all key stakeholders.

Also, there is little research done on the Namibian stock market and studies can segment the market to dissect accounting, finance and closely related subjects from different perspectives. The range of angles may include types of disclosures, market regulation, types of investors and types of listings; possibly segmented further by industry. This will not only serve to inform us about the NSX but will focus government and regulators to high performance sectors of the economy.

Academia, regulators, accounting and finance professionals, government and other stakeholders only stand to benefit from such research endeavors. Such benefits include improved regulation, policy enhanced by empirical findings and investor confidence, among other.

5.4 Conclusion

The results of the data analysis show that there are strong and significant relationships between certain accounting based variables and the share price on the NSX. These results are indicative of the possibilities and opportunities available in finance regarding the forecasting power of financial statements. Therefore, the significance of accounting statements and the indicators therein should not be ignored given their influence on the share price. This influence has a bearing on one of the most important indicators of value and wealth for shareholders. That in itself is enough to make accounting statements a formidable force in the decision making process for shareholders and all other stakeholders. This is can be said for small markets in developing economies such as the NSX and perhaps for others with characteristics similar to those of the NSX.

The Namibian stock market is steadily expanding, and this expansion is an indication of increased investor confidence and participation, both locally and internationally. The critical role of the stock market in the financial sector and the economy at large is continually emphasized in literature. This role is highlighted for the NSX specifically, in this report as academic research supports this role by finding empirical evidence which continues to justify and strengthen such role. This is done by pointing to practical implications for various stakeholders and regulators who only stand to benefit if they heed the call for developing and deepening the stock market and financial sector.

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