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Separating the winners from the losers:

a model for stock selection

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ABSTRACT

Through a multiple regression analysis on a number of financial and non-financial variables with the actual share growth over a period of 36 months, it was found that no correlation or relationship exists between share growth and almost all variables commonly used as screens for purposed of identifying stocks to potentially invest in for the longer term.

The four commonly selected value investing ratios explored in this study are the price-earnings ratio, dividend yield, price-to-sales ratio and book-to-sales ratio. Only two of these ratios were found to have a relationship to the growth in stock prices, albeit, very weak. If anything, this study has shown the importance of length historical data when trying to determine relationships and trends in order to determine whether a company is has investment potential.

The non-financial information used consisted of the environmental, social and governance scores or ratings as evaluated by independent analysts across companies in the industry. This is a relative new measure and therefore lacks sufficient history to enable credible conclusion of its impact on the growth of a share or the return investors over the short to medium term.

Keywords: Value investing, stock markets, Price-earnings, Dividend Yield, Price-to-book, Price-to-sales, ESG ratings, stock selection, environmental, social, corporate governance

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements of the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted for any other degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Keshni Morar   10 November 2014

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CHAPTER 1:   INTRODUCTION

The question any potential investor should ask is "can the past performance of a company provide a view of its future?" The cliché "hindsight is always 20/20" rings true when it comes to investing – this as a result of the fact that investors and academics alike have focused on historical data to find ways to beat the market to secure a high return on investments. Harold, Spitzer, & Emerson (2007) posit that in order to consistently beat the market, an investor needs to look beyond the numbers to generate alpha, that is, to achieve returns above the risk-adjusted performance of the overall market.

Since the advent of capital market investment sector, various 'investment gurus' have developed several theories on investment management – albeit, the theories are all premised off a common understanding – analysing the past, present and future by understanding the business and its sector, its operating results and financial performances, projections based on strengths, weaknesses, opportunities and risks, and a comparative analysis of various companies or a single company over different life cycles. In the testing of the efficient market hypothesis, Fama (1970) states that a company's share price "fully reflects" all available information, resulting in an "efficient" market, therefore making it impossible for investors to consistently beat the market. This is based on the understanding that knowing the past allows one to have a more informed view of the future. The view is further supported by the random walk theory which states that "the future path of the price level of a security is no more predictable than the path of a series of cumulated random numbers" (Fama, 1965). In citing the conclusion of a study done by Al-Khazali et al. (2007), Kearney (2012) notes that even though some of the Middle Eastern and Northern African (MENA) markets do not follow the random walk theory, the study failed to reject the theory out right.

An alternative view theorised by Harold, Spitzer, & Emerson (2007) is that through the technical analysis of the market itself, investors would look for trends in collective behaviour rather than looking at the fundamentals in isolation, in order to determine

the market value. Graham and Dodd (1934) however explored alternate ways to identifying hidden gems, which they deemed to be under-priced securities with potential to derive value. In other words, they look for stocks that are trading well below its intrinsic value to determine if a company is expected to have on average a high dividend yield and lower price-earnings, price-to-book, price-to-sales and price-to-cash flow ratios. Valuation is therefore based on fundamental analysis which involves the evaluation of both historic financial and non-financial information available. The drawback of this is that the intrinsic value is determined by forecasting future cash flows and then discounting them to the present. This is largely speculative and can vary which could negatively impact the perceived value.

In high risk markets, a company's financials may not be the only indicator of potential performance, hence a further review and consideration of the non-financial information may be required to determine investment potential (Healy & Palepu, 2001; Schiereck & Königs, 2008). Investors acknowledge the complex relationships between a company and its stakeholders, both internal and external. Investors looking to invest in emerging country companies need to not only understand the economics of the business, but go beyond to understand the broader environment in which the company operates (Chakrabarti, Gupta-Mukherjee, & Jayaraman, 2009; Faccio, 2006; Harrison, Lin, & Xu, 2014; Hubbard, 2009; Kearney, 2012).

The Social Investment Forum Foundation (2009) presented a paper arguing that by identifying the qualitative non-financial factors which materially impact long-term profitability and performance of the business, an investor could grow their investment yield competitive returns. This position in recent years has been adopted by various markets in terms of setting reporting requirements to be satisfied by listed companies in such markets. An example to this is in countries such as South Africa where listed entities are mandated to publish integrated reports incorporating financial results, social impact, environmental impact and corporate governance matters. Disclosure of this information provides investors with a view of various aspects within the business, including the company's strategy and its ability to mitigate pressures from the environment in which it operates.

Therefore whilst financial measures are considered to be a primary indicator of the effectiveness of its policies to generate a return to its investors, the non-financial factors provide insight into the company's current and future competitive positions.

1. Problem statement

It is becoming more evident within the evolution of capital markets globally, and in light of the recent economic downturn, that in order to instil confidence among investors with a keen eye on emerging markets, a mere understanding of the financial performance, past and present, is insufficient on its own in determining impacts on future earnings or returns. Based on these trends, one can assume that a well-informed investor is one who couples financial performance information with the company's social, environmental and corporate governance ratings, to determine the investment potential within a company.

However, due to the infancy of environmental, social and corporate governance requirements on listed companies, empirical studies to demonstrate the impact of these ratings on share price are currently limited. Within emerging economies this approach remains largely unexplored due to there being no consistent or mandatory requirement to report on these factors across stock exchanges. In addition, very few studies have been undertaken to test the combination of financial ratios with non-financial information for purposes of identifying undervalued stocks.

Thus, this research aims to explore this gap by attempting to build a simple valuation model which can be used to quickly assess a company, using financial and non-financial measures, in order to determine whether it is a good investment.

2. Research Scope

The scope of the research is limited to companies listed on emerging country stock exchanges, namely India and South Africa, as a result of these two markets being the

only emerging markets with available environmental, social and corporate governance ratings. Companies which do not report on environmental, social and corporate governance have been excluded from the study in order not to obscure final results, thus reducing the overall sample size and period over which study can be applied.

CHAPTER 2:   LITERATURE REVIEW

1. Overview

The aim of this study is to examine the various financial ratios and non-financial ratings in relation to ESG in order to establish an appropriate model which investors can adopt in the selection process of stocks in emerging markets.

The aim of any company is to increase its market value in the long run (Kocmanova & Docekalova, 2012) and the aim of any investor is to get a return on investment which compensates or exceeds the risk taken by the investor. By investing in stocks, the investor holds a percentage ownership in the company which entitles him to a share in the profits in the form of dividends and a return on investment in the form of an increase in the value of a stock over a period of time. The return received should outweigh and compensate the risks taken.

This chapter therefore provides an insight into the empirical studies undertaken over the past three decades with the view of extrapolating the most efficient mechanism to enable investors to glean investment opportunities within emerging markets.

2. A case for emerging markets

Emerging economies are broadly described as "those countries which have started to grow but have yet to reach a mature stage of development and/or where there is significant potential for economic or political instability" (ICEF Monitor, 2014).

A study by Kargin (2002), using sample company data for period between January 1976 and October 2000, showed that returns in emerging economies [Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela, India, Sri-Lanka, Indonesia, Korea, Malaysia, Pakistan, Philippines, Taiwan, Thailand, China, Greece, Turkey, Hungary, Poland, Czech Republic, Romania, Russia, Slovakia, Israel, Egypt, Morocco, South Africa and

Zimbabwe], despite high market volatility, remained attractive in comparison to developed markets such as the United States. One cited reason is that an optimal share of undervalued emerging markets was found to be higher than the optimal share of the portfolio of all emerging markets. This lends itself to the position that investment in a temporarily undervalued market was found to be more attractive. In addition, the price-earnings ratio; the book-to-price ratios and the historic changes in share price provide investors with the ability to predict returns in these markets (Kargin, 2002).

Over the past decade, emerging economies have drawn the attention of global investors due to its high economic growth and higher returns on investments in comparison to developed countries, thus providing investors with the option to diversify their portfolios (Gambhir & Bhandari, 2011). By exploring the risks between emerging markets and various benchmarks [IFC Global Return Index, MS Emerging Markets Gross Return Index, MS Developed Markets World Index Gross Returns Index and the S&P 500 Price Returns index], Kargin (2002) concluded that there are no significant differences in the levels of risk. In some cases, the level of risk in emerging markets was lower than risks associated with the benchmarks, and as such made emerging markets more attractive to investors.

According to Kearney (2012) in the past two decades there has been a focus of sustained research into emerging markets primarily due to the fact that such markets comprises the greater of the global population and land mass and more importantly that they have the tendency to grow faster than the developed world. Whilst emerging markets are diverse in culture, language, religion and politics, they do present well-developed physical financial infrastructure on the one hand and at the same time, less developed processes and systems monitoring governance, regulations, efficiency and liquidity on the other hand. Kearney (2012) posits that whilst this is often considered a deterrent for investors, there is significant and rapid changes being made, leading to quicker growth of such markets. The study further illustrates the potential benefits for investing in emerging markets by citing the fact that based on results between

emerging and developed markets all indication is that emerging markets do still yield higher returns albeit amidst higher market volatility.

3. Fundamental analysis

An investor can diversify their portfolio in various ways. From acquiring a company, to joint ventures, or basically investing in shares listed on a stock exchange, each of which comes with its pros and cons and minimal level of investment required. For the average investor, stock options are a way to gain access to the piece of a company without having to go into major debt or acquire controlling ownership in a company. Individuals and organisations invest in the expectation that their investment will grow to a sufficient amount that would reward them for the risk they have taken (Koller, Goedhart, & Wessels, 2010).

It is well understood that a number of financial models exists such as the discounted cashflow model (DCF) which is currently used to evaluate a company's net present value (NPV) based on projected cash flows over a period of time (Firer, Ross, Westerfield, & Jordan, 2012). However, this requires the knowledge of corporate finance and takes time to evaluate. These models allow investors to determine the market related value of a company. For purposes of this study, simpler measures, both financial and non-financial will be explored to predict which companies have potential for growth and whether or not the stock should be invested in.

Based on the empirical studies reviewed, contributors such as Contreras, Hidalgo, & Núñez-Letamendia (2012) hold the position that two general techniques exist for the prediction of stock market pricing, namely *technical analysis* and *fundamental or intrinsic value analysis*. Whilst technical analysis involves among others, forecasting of asset prices based on the visual observation and examination of historical price movement, fundamental analysis evaluates stocks by attempting to measure its intrinsic value. This is done in order to identify undervalued stock (Contreras et al., 2012). To reiterate, this study focuses only on the application of the fundamental analysis of stocks.

Fundamental analysis is the evaluation of both financial and non-financial data available on a company with the aim of identifying potential investments. It focuses on identifying potential investment opportunities based on expected future returns. Investors who rely on fundamental analysis attempt to identify "mispriced" stocks through rigorous valuation of each company's financial statements and other company reports. According to (Chou & Liao, 1996; Li & Mohanram, 2014), by identifying and investing in these "mispriced" stocks, investors hold onto them until the market "corrects" itself, thereby pushing up the value of the stock.

The alternative view to the above is demonstrated by Piotroski (2000) who has shown that investors can use relevant historical financial information to identify and eliminate poor performing companies from a generic portfolio with high book-to-market values. In addition, Bird, Gerlach, & Hall (2001) replicated the study by Ou and Penman (1989) which concluded that accounting information can be used for forecasting the direction of the company's future earnings.

Contreras, Hidalgo and Núñez-Letamendia (2012) strengthened this argument by concluding that company specific factors, both financial and non-financial play an important role in stock price forecasting in the long term. Samaras, Matsatsinis, & Zopounidis (2008) hold the position that by gaining an insight into the company's financial health through the use of various financial ratios and a number of qualitative factors, investors are able to determine whether or not a stock is undervalued or overvalued

The application of fundamental analysis is characterised by two distinct approaches: (1) the intrinsic value approach which requires the use of analyst forecasts in conjunction with an accounting based valuation model; and (2) financial statement analysis, which relates to the review of the company's income statement, balance sheet, cash flow statement (Li & Mohanram, 2014). Financial data is therefore the first source of information into the performance of the business in the past, and projecting its future growth ability.

Kheradyar, Ibrahim, & Nor (2011) have found that the dividend yield (DY), earning yield (EY) and book-to-market (B/M) ratios, when applied to stocks listed on the Malaysian stock exchange for the period 2000 to 2009, were able to predict future stock returns. They go on to state that by combining these financial ratios, the predictive power of these increases as a result of the fact that the ratios are unique and complimentary due to each ratio providing specific information which is used by investors to determine stock returns. Despite the econometric shortcomings of predictive regression models, valuation ratios based on fundamental values have been proven over time to forecast stock prices (Fama & French, 1988; Gupta & Modise, 2012).

4. Value investing

Value investing – an investment methodology first established in the early 1930's by Graham and Dodd (Graham & Dodd, 1934) – is based on the identification of under-priced shares which has been widely researched and which is continually being stretched. (Sareewiwatthana, (2012); Shen, Yan, & Tzeng, (2010) and Yan & Zhao (2010) posits that value investing involves the valuation of companies based on their financial data through the application of various financial ratios related to the market value of the company. They argue further that value investing strategies have been proven to generate superior returns in comparison to the market.

A number of studies, as far back as the 1960s, using price-earnings ratio, book-to-market ratio, price-to-cash flow ratio and the dividend yield to identify undervalued companies had been undertaken using data from different markets around the world, in the United States (Ball, 1978, 1992; Basu, 1975, 1977; Jaffe, Keim, & Westerfield, 1989; Lakonishok, Shleifer, & Vishny, 1994; Nicholson, 1960, 1968), Taiwan (Shen et al., 2010), Thailand (Sareewiwatthana, 2011, 2012, 2013), North America, Europe, Japan, and Asia Pacific (Fama & French, 2012).

According to Athanassakos (2012) value investors are contrarian in that they are wary to pay too much for a stock or share and alternatively pick stock for long term investment periods. They generally follow three basic steps: (1) identify stocks which

could be deemed as undervalued by the market based on ratios such as a low price-to-earnings (P/E) ratio, high price-to earnings growth (PEG) ratio, or some other identified financial ratio; (2) determine the intrinsic value of the identified stock and finally; (3) make the decision to buy specific stocks which stock price is below its intrinsic value. Whilst this three-step process sounds simple enough, the background work and understanding of the stocks and the market in which it trades is substantial.

Damodaran (2012) on the other hand, stated that once the first filter is applied, that is, identification of stocks with low P/E ratio and other financial ratios, the stocks selected from the refined list should be the stock which other investors would deem as untouchable based on market perception. The aim would be to invest in these stocks with the ability to use one's position of power to drive positive change in the organisation, thereby unlocking value. Kargin (2002) concluded that returns can be predicted in emerging markets using the price-earnings ratio, book-to-price ratio and past change in the stock price.

In his review of Warren Buffet's investment philosophy and practice, Rajablu (2011) presents an enhancing position to the above in that he notes that Warren Buffet holds the belief that an investment decision should be made on economic reality and not solely on accounting reality. He further recommends the review and inclusion of other factors of the business such as the company brand, the strength of their management team and other valuable tangible assets.

Moving away from company specific analysis to a broader view for positive returns, Yan and Zhao (2010) presents an analytic approach based on returns on a country's index funds. Their position, based on "delta strategies", argues that value investing on a national level in an emerging economy has positive returns in excess of 14.25% to 16.89%. In understanding this concept, delta strategies entails taking into account the country's delta weight. This is achieved by calculating the difference of a country's weight based on value of its gross domestic product (GDP), earning-price (EP) or dividend yield (DY) against it capitalisation weight. According to Yan and Zhao (2010), a country's index fund is considered undervalued where the delta weight is calculated in

the positive. In this instance, the strategy would be to buy the delta shares of that country's equity. On the other hand, a negative delta weight would place the country's index fund in a deemed overvalued position and the strategy is to lower (sell off) the delta shares of the country's equity. Simply put, this strategy is no different to the approach which should be applied when reviewing stock options of a company for the purpose of investment.

Seasoned investor know that there is no single methodology or model which is capable of accurately predicting or uncovering under-priced or over-priced stocks, however, it is important to have some sort of consistent methodology with which to valuate and select shares (Brentani, 2004).

The section below explores the empirical studies to prove that the financial ratios such as price-earnings, dividend yield, price-to-sales and price-to-book ratios can be used for identifying value stocks.

5. Financial ratio indicators

As illustrated above, predicting stock returns is arguably one of the most important issues in financial economics. The studies referenced herein indicate various approaches adopted across the globe, both from a company as well as country index perspective. That being said, the position taken in the reviews above all seem to lead to a similar conclusion, that being, that predictability based on valuation ratios such as price-earnings, dividend yields and the like are fundamentally the primary examination criteria in determining stock investment. In identifying a less complex methodology for investors it is critical to have a concise understanding of the different financial ratio indicators and more importantly price ratio analysis and its effect on stock evaluation with the view to invest. These are further explored in this section.

5.1. Price-to-earning (P/E) ratio

Price-to-earnings, commonly known as the PE ratio, is probably one of the most widely used and most important market ratios in evaluating the company's stock. By definition, this ratio represents the current price per share to earnings per share (Brentani, 2004). For example, if the closing stock price P=ZAR100 and the annual Earning per share (EPS) is ZAR10 the Price to Earnings (P/E) multiple = ZAR100/ZAR10 = ZAR10. The PE ratio is understood to mean that if at 10 then investors would pay ZAR10 per ZAR1 of the company's earnings. Shares trading at low PE ratios have earnings per share at a discount in comparison to its peers (Schatzberg & Vora, 2009) making the share attractive to value investors for further valuation. Thus the lower the P/E, the more its intrinsic value exceeds its price. The reverse of a Price/Earnings ratio is an Earnings/Price ratio, the earning yield indicator (Sareewiwatthana, 2011). This is measured as earnings per share divided by the current stock price resulting in a percentage figure used to evaluate the profitability of the investment.

In the Damodaran (2012) study on the United States for the period 1952 and 2010, it found that using P/E ratios for stocks, divided into ten deciles, companies in the lowest P/E ratio class exceeded stocks in the highest P/E class in excess of 12.21% between 1952 and 1970 and 9.9% more between 1991 and 2010 (Figure 1).

Figure 1: Return on PE ratio classes - 1952-2010 (Damodaran, 2012)
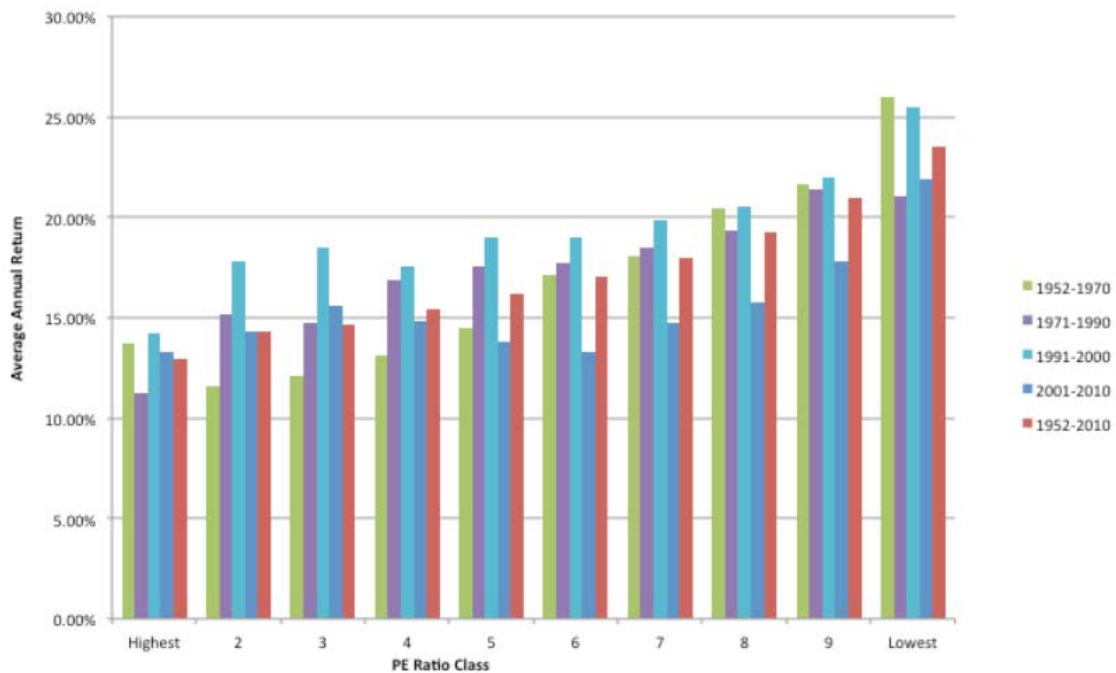
Damodaran (2012) also found that Italian companies with the lowest P/E ratios earned the highest premium over the market between 1989 and 1994 at 14.16% in comparison to Australia, France, Germany, Hong Kong, Japan, Switzerland and the UK (Figure 2).

Figure 2: Excess Returns on Low P/E Ratio Stocks by Country: 1989-1994 (Damodaran, 2012)

Country	Annual Premium earned by lowest P/E Stocks (bottom quintile) over the market
Australia	3.03%
France	6.40%
Germany	1.06%
Hong Kong	6.60%
Italy	14.16%
Japan	7.30%
Switzerland	9.02%
U.K.	2.40%

Annual premium: Premium earned over an index of equally weighted stocks in that market between January 1, 1989 and December 31, 1994. These numbers were obtained from a Merrill Lynch Survey of Proprietary Indices.

The formulae used to calculate the price-earnings ratio is as follows: first, determine the earning-per-share by taking the net income and dividing it by the number of outstanding shares:

Equation 1: Earnings per share
$$EPS = Net\ Income/Number\ of\ outstanding\ shares$$

then take the price per share and divide it by the earnings per share:

Equation 2: Price-to-earnings ratio
$$PE = P/EPS$$

Where :

PE = Price-earnings ratio

P = Price per share

EPS = Earnings per share

The EPS in the PE ratio is a company's net income divided by the weighted average of outstanding shares. Differences in accounting methods adopted across companies introduce inconsistency when comparing companies as it directly affects the PE ratio. A number of variables such as inventory management and tax treatment is strongly and positively correlated to the PE ratio, making it arduous to compare companies to each other, at least on face value (Craig, Johnson, & Joy, 1987).

The denominator of the PE formula, the EPS, relies on a company having a net income as opposed to a net loss. Companies who have negative PE ratios are usually excluded from the selection list. The stock price is based on market perception and therefore relies on market efficiencies for accuracy on the view of the company. Companies could therefore be either undervalued or overvalued based on market perception (Damodaran, 2012).

To a novice investor, the use of the P/E ratio would seem straight-forward. However, using this metric in isolation is potentially dangerous, as the PE ratio can disguise

companies which are in financial distress as undervalued stocks (Damodaran, 2012; Sareewiwatthana, 2012, 2013). According to Schatzberg and Vora (2009), the reasons for undervaluing a stock can include: (1) the stock lies in an undesirable industry; (2) investors have not recognised the company's growth potential; or (3) investors are avoiding the stock due to some unfavourable condition either in the industry or the specific company.

In order to filter out undesirable stocks and control risk, stocks with a low PE and high EPS rate should be selected (Sareewiwatthana, 2012). This prevents or minimises the chance of selecting a stock disguised as an undervalued stock which could lead to poor investment choices in the long run. In other words, a stock with a PE lower than the growth rate of the company, is deemed to be a bargain (Schatzberg & Vora, 2009).

5.2. Dividend yields (DY)

Dividend yield investment strategies fall under a broad category of value investing. Investors are compensated for holding stocks through the pay-out of regular and consistent dividends as well as through an increase in the value of the stock. It is calculated based on the after-tax profits and paid out of retained earnings. Companies are more likely to increase dividends and by greater levels if the dividend premium is high, which tends to lead to inflated stock prices and vice versa (Li & Lie, 2006).

Before investing, an investor should ideally gain a view of the company's dividend policy to gauge its impact on the stock price and the company's ability to consistently pay-out a dividend and the timing of each expected pay-out.

The dividend yield (DY) is an important measure as it provides an investor with a view of future returns and cash flow (Chen, 2012). The DY is an indicator of the rate of return on a long term investment, hence the higher the dividend yield, the higher the return on the long-term investment (Sareewiwatthana, 2011). Therefore, a stock which provides a dividend yield higher than a benchmark such as the FTSE or ALSE Index, or the return on a Government Bond held for the same period of time is desirable.

Damodaran (2012) established that high dividend yields stocks in the US provided a higher return when compared to low yield dividend stocks. However, this only held true for the period 2001 to 2010. Historically though, between 1591 and 2000, high dividend yielding stocks underperformed or were on par with low dividend or non-dividend paying stocks.

Simplistically, the following equation can be applied to calculate the dividend yield:

Equation 3: Dividend Yield

$$DY = DPS/P$$

Where :

DY = Dividend Yield

DPS = Annual dividend per share

P = Price per share

Jiang and Lee (2007) pointed out that a high dividend yield does not always indicate a good stock. Stocks with a low growth potential may offer a high dividend yield while companies with a high growth potential may offer low dividend yield even though the overall result is a higher return through increase in stock price. In addition, dividends are not guaranteed, that is, depending on where in the lifecycle the company is, its strategy and funding requirements, the company may decide to reinvest the money instead of paying out a dividend (Jiang & Lee, 2007). If a company is paying out too much as a dividend, an investor should question its growth plans and achievability thereof, in line with the company's forward-looking strategy. Since a declining stock price with a high DY, is commonly understood as an indicator of a company in distress, it is therefore imperative that this measure not be used in isolation when determining investment probabilities (Damodaran, 2012).

5.3. Price-to-sales (P/S) Ratio

The price-to-sales (P/S) ratio is the perceived value of a stock by the market compared to the revenues of the company within a particular financial period. Chou & Liao (1996) maintain that in the absence of a PE ratio due to negative earnings, the P/S ratio can be used instead to assess a company's performance. This ratio is understood to determine a company's ability to stimulate sales growth. Sun (2012) and Chou and Liao (1996) recognises that this ratio has been proven to show some predictive power in the long term, and like the P/E ratio, allows an investor to identify "value stocks".

A number of studies across the globe have proven that the P/S ratio is an important investment indicator which is closely related to leverage and asset turnover. Leverage is closely linked to the management's strategy while the asset turnover is sensitive to the business cycle (Suzuki, 1998), hence profitability and debt should be monitored as well. Some may regard this as a superior formula over the P/E ratio as earnings can be manipulated or distorted based on adopted accounting practice (Damodaran, 2012).

Chou and Liao (1996) purports that the price-to-sales ratio is superior to the price-to-earnings ratio for several reasons, namely:

1. Earnings can be manipulated based on the adopted accounting practices, whereas sales are not. In addition, the sales figure is more predictable and stable than earnings;

2. The price-to-sales ratio is a meaningful measure even when the company is losing money; and

3. An investor unnecessarily eliminate stocks because the earnings are low (high) and the P/E ratio is temporarily high (low) due to the cyclical nature of the business or a downturn (upswing) in the economy

The price-to-sales ratio is calculated as follows:

Equation 4: Sales per share
$$Sales\ per\ share = Sales_t / Shares_w$$

Where :

$Sales_t$ = *Annual sales for period t*

$Shares_w$ = *Average weighted number of shares for period t*

Equation 5: Price-to-sales ratio
$$PS = P/S$$

Where :

PS = Price-to-sales

P = Price per share

S = Sales per share

No ratio goes without its disadvantages. The price of the share or stock is based on the perception of its value in the market. By using this as the variable in the numerator of the formula, investors should remain cognisant that the stock can either be perceived as an undervalued investment and therefore a good investment or the opposite, a poor investment in comparison to other companies in the same industry (Damodaran, 2012).

5.4. Price-to-Book (P/BV) ratio

Price to Book Value (P/B) is the reciprocal of the book-to-market ratio and shows a ratio of stock price to book value. In other words, it provides a view of how much an investor has paid for dollar of assets owned by the company. The lower the ratio, the better the stock in terms of its intrinsic value compared to its market price (Sareewiwatthana, 2011).

Fama (1992) studied stock returns in the United States between 1963 and 1990 by splitting a number of companies into twelve portfolios using the book-to-price ratio as a basis. He found that companies with the highest book-to-price (lowest price-to-book) portfolio earned an annual average of 24.31%, 20.6% higher than the lowest book-to-price (highest price-to-book) companies.

Damodaran (2012) who based a study on US stocks between the period 1927 and 2010 concurred with Fama's (1992) study in that he found that the lowest price-to-book stocks earned, on an annualised basis, 6.24% more than the high price-to-book stocks (Figure 3).

Figure 3: Price-to-Book classes and returns - 1927-2010 (Damodaran, 2012)
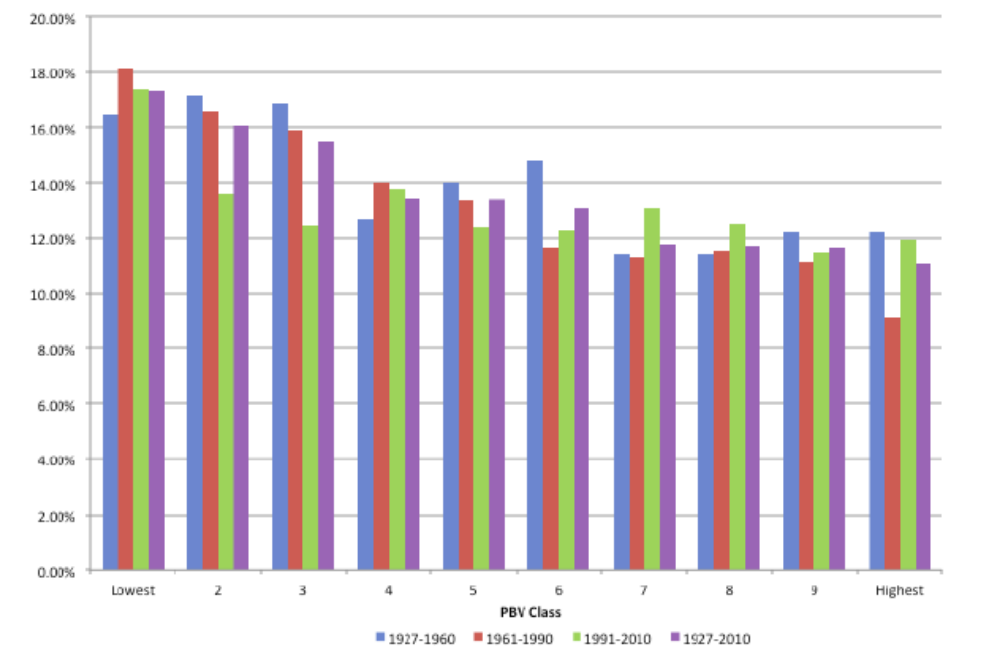
The formula to calculate the price-to-book ratio is:

Equation 6: Price-to-Book ratio

$$PB = P/BV$$

Where :

PB = Price-to-book

P = Price per share

BV = Book Value

Book Value is calculated as follows:

Equation 7: Book Value equation

$$BV = Totat\ assets - \ Intangible\ assets\ and\ liabilities$$

The price-to-book ratio is useful in comparing companies which are asset-intensive. Service related companies with low assets values will trade at high price-to-book ratios, and thus the screening process should take into account the industry and asset requirements in order not to distort the outcome based on comparability across

companies and/or industries. It must be noted that a low price-to-book value may indicate that the company is in financial distress. In this instance, according to Damodaran (2012) if a company has a low price-to-book ratio, the company's risk related to leverage and its return on equity should be considered.

6. Non-financial indicators

Healy and Palepu (2001) argues that in ensuring the efficient functioning of a capital market, corporate disclosures, comprising of financial statements, regulatory filings, management disclosures and the like, are critical. Their position advocates for the incentivising of companies to voluntarily disclose information in order to produce an efficient level of information and confidence for investors in the economy.

This position is supported by Mănescu (2011) who maintains that the incorporation of social, environmental and governance performance – commonly referred to as ESG – is becoming increasing popular and that the major forces behind this surge is the increasing demand for such information from both institutional and individual investors alike. This demand is due to the increasing awareness globally of the impact of climate change, political turmoil which could result in some instances, to market instability and economic down grading.

Claessens & Yurtoglu (2013) pointed out the severe negative repercussions on the entire economy due lack of companies being held to corporate governance standards in countries such as the United States, Russia, Asia and Brazil. With markets opening up, the increased ease in trading and movement of capital across borders, the necessity and importance to reporting on ESG is pivotal in ensuring that the actions of a company is limited so as not to impact the country as a whole (Claessens & Yurtoglu, 2013).

Harold et al. (2007), emphasises the above statement in their position that financial markets are gradually adopting integrated reporting which incorporates financial performance, social and environmental impacts and corporate governance

performances as consideration criterion in market valuations. This change is influenced by the increasing pressures from various key stock pricing stakeholders – for example, investors are demanding more non-financial information, regulators require information in order to determine efficient market mechanism to attain optimal national financial stability goals and consumers are increasingly seeking out ethically defensible products.

In recent years, investment houses and portfolio managers have started incorporating the non-financial indicators such as environmental, social and corporate governance (ESG) into their investment recommendations. ESG ratings cover issues such as emission reduction, use of natural resource, environment related product innovation, employee satisfaction, attraction and retention, product responsibility, separation of chairman and CEO, bribery and corruption, executive remuneration, just to name a few (Thomson Reuters ASSET4, 2011a).

Companies which are deemed to have good corporate governance in place have been found to benefit in a number of ways such as access to lower cost financing, improved stock market performance and favourable treatment from stakeholders (Claessens & Yurtoglu, 2013).

Each of these variables is described in **Table 1** below and is based on the definition provided by Thomson Reuters ASSET4 (2011b):

Table 1: ESG variable definitions

Factor	Aspect	Explanation
E	Environmental	"The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as completes ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalise on environmental opportunities in order to generate long

		term shareholder value."
S	Social	"The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value."
G	Economic	"The corporate governance pillar measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long term shareholder value."

Each company reporting non-financial information, in the form of integrated reporting or similar is compared to all other companies at the same level (scored) in order to underline the competitive advantages of a company. The ESG ratings in the Reuters ASSET4 database are equally weighted assessments of company performance based on the over 250 key performance indicators. These ratings are then normalized to get the score between 0 and 100% (Thomson Reuters ASSET4, 2011b).

The number of studies in this area of specialisation is growing to show the impact on the value of an organisation as well as the longevity of it (Bassen & Kovács, 2008), however, it still remains a largely unexplored field. In practice, Hayat & CFA (n.d.) strongly recommend the incorporation of ESG factors into the evaluation of companies when making investment decisions as it provides a rounded view of the company's performance. The ESG ratings will provide an investor a view of the company's "softer issues" which may be hiding behind a strong share price and may negatively impact the value of the share in the future.

Companies have therefore started actively reporting on the various activities which are not accounted for in the financial performance. The challenge which an investor faces is the non-standardised format in which these vast amounts of information are disseminated in the public domain. This often makes comparing of efforts across companies quite difficult (Bassen & Kovács, 2008; Gillan, Hartzell, Koch, & Starks, 2010).

Gillan, Hartzell, Koch and Starks (2010) studied 21,638 companies across the United States and found that companies with high ESG scores had lower operating expenses and therefore higher earnings, thus suggesting that these companies are operationally more efficient.

Maubane, Prinsloo, & Van Rooyen (2014) found that companies listed on the Johannesburg Stock Exchange generally complied with the JSE Social Responsibility Index (SRI) (Figure 4).

Figure 4: Broad ESG categories across market sectors (Maubane et al., 2014)
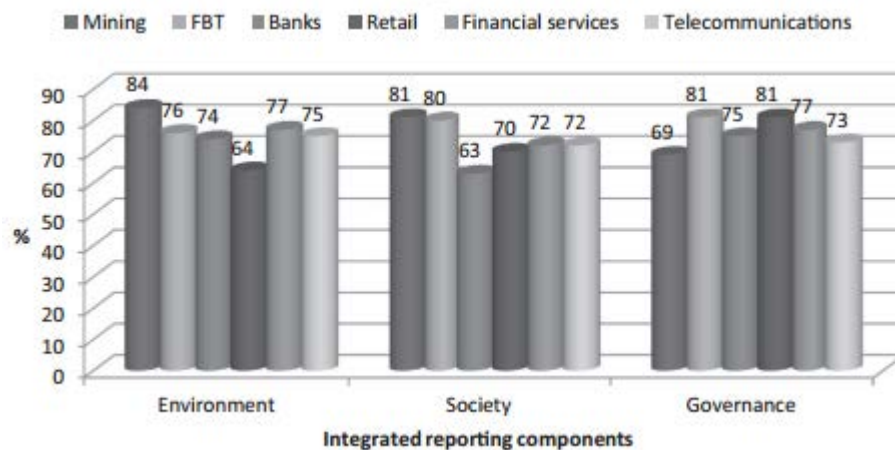
Due to broad definitions, lack of understanding of some criteria and reporting procedure, the process is still imperfect and leaves gaps for companies to decide what they will report and what they won't divulge (Maubane et al., 2014). This in itself

creates bias on part of the company and may have negative impacts on investors consuming this information for valuation purposes.

Manescu (2011) argues that there are costs and benefits related to concerns around environmental, social and corporate governance, however, it is unclear which are higher and in order for stock prices to reflect these costs or benefits, sufficient information should be publically available to incorporate it efficiently. This is in line with the efficient market theory which postulates that all available information is incorporated and reflected in the stocks trading price (Bassen & Kovács, 2008).

Nonetheless, by understanding the environment in which companies operate, investors can get a view of the challenges the company and industry faces as well as what changes are expected to happen in the future which could affect the profitability and longevity of the company (Bassen & Kovács, 2008). Investors should focus on the company's strategy and the integration of its ESG investments to deliver stronger economic results and should therefore reflect the future cash flows (Kocmanova & Docekalova, 2012).

7. Summary of literature review

Based on the literature review, it is well established that a number of financial ratios based on historical data can provide an investor with guidance when it comes to selecting stock. In each instance however, the empirical studies all point to a cautionary when addressing each financial ratio in isolation to the others. It is evident through the studies that in order to have a concise understanding of the viability or sustainability of the stock being considered, past data in excess of a decade is favoured (Damodaran, 2012). When looking for value stocks specifically, the power of "prediction" is also strengthened when these ratios are combined to screen stocks for selection. This is especially true for stock selected for investment in the long term, that is, for a period of ten years or longer.

In addition, the common thread throughout the studies reviewed, emphasised the need for the inclusion of non-financial information as a critical contributor in determining investment potential especially in high-risk markets. The substantiation for this position is that without qualitatively identifying the non-financial factors, investors are unable to have insight into the material impact these factors could have on the ability to forecast both the profitability and long-term performance of the business.

The various empirical studies in highlighting the importance of social, environmental and corporate governance ratings for stock valuation explicitly indicate the insufficiency of research in relation to impact assessment of ESG on stock pricing and returns. The incorporation of the ESG ratings available by data providers such as Reuters Datastream has been largely unexplored, albeit, a growing field of interest. Although the combination of financial and non-financial measures has been explored internationally, studies in Africa (including South Africa) are limiting. This provides the gap for future research to explore further.

CHAPTER 3:   RESEARCH PROPOSITION

1. Aim of research

The aim of this research is to build a simple valuation model which can be used to quickly assess a company's stock, in order to determine whether or not to invest in the stock.

Based on the literature review, the independent variables to be used for developing the model are:

Table 2: Variables to test

Financial	Non-financial
Price-earnings	Environmental score
Dividend yield	Social score
Price-to-sales	Corporate governance score
Price-to-book	

The dependent variable is the compounded annual growth rate (CAGR) of the share price for each company. The CAGR per share was calculated over a 36 month period, which is from 1 January 2011 to 31 December 2013.

1. Research proposition

A model can be developed using selected financial ratios and non-financial ratings to identify stocks in which to invest by comparing the growth potential of a list of stocks to each other thereby aiding the investor in making an investment decision.

CHAPTER 4:   RESEARCH METHODOLOGY

1. Methodology

This study is cross sectional, exploratory study as static data will be used to develop and test the model at a single point in time and this is not based on any pre-existing model (Saunders & Lewis, 2012, p. 113). The financial ratios selected were based on findings in the literature review and are listed in Table 3 below:

Table 3: Financial Ratios

Factor	Ratio	Calculation
PE	Price-earnings	Share price / Earnings per share
DY	Dividend Yield	Annual dividend per share / Price per share
PS	Price-to-sales	Price per share / Sales per share
PB	Price-to-book	Price per share / Book Value

The non-financial information used is based on data extracted from the Thomson Reuters ASSET4 database covering:

Table 4: ESG variables

Factor	Description	Max value
ENVSCORE	Environmental score	100
SOCSCORE	Social score	100
CGVSCORE	Corporate Governance Score	100

The effectiveness of the model will be tested in terms of its ability to identify companies to invest in by applying the final findings to a second sample of companies. For simplicity, in order to determine whether or not a stock is worth investing in, the actual growth of the share in terms of share price between 01 January 2012 and 31 December 2013 was be used. This was determined by calculating the compounded annual growth rates between the selected 36 month period.

A quantitative, inductive study is best suited for this type of study as each variable will be tested in combination with others in order to ascertain the ideal combination (Saunders & Lewis, 2012, p. 109).

2. Population and sampling

The target universe is all companies listed on stock exchanges in the BRICS nations, that is Brazil, India, China, Russia and South Africa. The research was subject to accurate data for the key financial ratios selected and valid ESG ratings. Using probability sampling (Saunders & Lewis, 2012, p. 133), data was retrieved for over 2000 companies across the five exchanges for a period of ten years (2003-2013). The key criteria applied to filter companies to form part of the population are as follows:

1. The asset class is classified as equities;
2. The stock had to be active;
3. The company had to have a full set of data, which is, each company had to have a full set of financial and non-financial data (ESG ratings). The inclusion of companies within both samples is further explained below.

A summary of the universe (active and inactive) is summarised in the Table 5: Population statistics based on Datastream database below:

Table 5: Population statistics based on Datastream database

Country	Stock Exchange	Number of securities on exchange
Brazil	BM&F BOVESPA	2,040
Russia	Russian Trading System	987
India	National Stock Exchange	2,445
China	Shanghai Stock Exchange	1,342
South Africa	Johannesburg Stock Exchange	1,699

Two samples were required for this research, one to develop the model and another to test the model. In order to identify specific companies to include in both samples, purposive sampling (Saunders & Lewis, 2012, p. 138) was applied.

by following the steps below:

1. Based on the literature review, a period of ten years or more is ideal for determining return on investment for value stocks. Data was extracted for the period 2003 to 2013.

2. The maximum and minimum numbers of years of available data per company, financial and non-financial, was ascertained through a basic elimination process by removing any company with errors or where no data was available. For example, a company may have had ten years of financial data, however, only the last two years had ESG ratings (non-financial data), hence the last two years qualified to be a candidate for the final sample.

3. The currency was standardised to South African Rand (ZAR) and calculated by Thomson Reuters Datastream using the presiding exchange rate at that point in time. 2012 represents the largest sample which has a history of a complete set of data.

4. Outliers were removed from the sample to reduce the possibility of obscuring test results. Two South African companies were removed from sample one as their results were extreme outliers and this negatively obscured the tests. In order to keep the sample size of the sample to be used in the development of the model the same, these two companies were therefore replaced by two random companies from second sample, thus reducing the size of the second sample.

5. The number of companies per exchange qualified to form part of the sample are summarised in **Table 6**.

6. Brazil and China were removed as the number of companies available in these markets were insignificant, reducing the sample to 181 companies.

7. Sample 1 which was used to develop the model was made up of 91 companies and sample 2 which was used to test the model contained 90 companies.

Table 6: Companies selected through a process of elimination

Country	Stock Exchange	Number of securities on exchange*	Number of companies which qualify
Brazil	BM&F BOVESPA	2,040	8
Russia	Russian Trading System	987	0
India	National Stock Exchange	2,445	70
China	Shanghai Stock Exchange	1,342	1
South Africa	Johannesburg Stock Exchange	1,699	111
TOTAL		8,513	190

*Securities include all listed investment instruments on the stock exchange.

The companies were extracted alphabetically from the Datastream database. From the final combined list, the split was through systematic sampling (Saunders & Lewis, 2012, p. 136) by selecting every second record to be included in each sample, thus sample one has all even numbered records, whilst sample two has odd numbered records.

3. Unit of analysis

The unit of analysis is the static values of each of the financial ratio, non-financial scores and stock prices as at 1 January 2012. The Indian stocks were converted to South African Rands (ZAR) at the presiding exchange rate as at 1 January 2012 by Thomson Reuters Datastream.

The dependant variable identified is the growth in share prices which is an indicator of return to the investor. Share prices at the 30 December 2013 were extracted at the spot exchange rate for Indian shares which was calculated by Thomson Reuters Datastream.

The return was calculated using the compounded annual growth rate of each share:

Equation 8: Compounded annual growth rate (CAGR) of share price

$$CAGR_X = ((FV_{X2013}/PV_{X2012})\wedge(1/n)) - 1$$

Where

CAGR$_x$ = Compound Annual Growth Rate of share price *x*

FV$_{x2011}$ = Share price on 31 December 2013

PV$_{x2013}$ = Share price on 1 January 2012

n = number of periods in years

4. Data collection

Thomson Reuters has a standardised a system for capturing and analysing financial and non-financial information on listed companies, making comparison of results between companies more meaningful.

The Thomson Reuters Datastream and Thomson Reuters ASSET4 databases were used to retrieve a sample for an eleven year period. Ratios were calculated by Datastream and non-financial data were based on the ESG ratings as reported by Thompson Reuters ASSET4.

5. Data analysis

The following logic was applied to retrieve the data:
1. Data had to be available from a reputable source. Examples of alternative sources which could be used are Bloomberg and McGregor iNet Bridge; and
2. The same model can be applied to any listed company where both financial and non-financial information is available

In determining which variables should be used in the final model, the following process was followed:

1. A regression analysis was done and based on the Pearson correlation; the correlation coefficient was checked to determine direction and strength of the correlation. Where no significant correlation was found between independent variables and the dependent variable, the independent variables were omitted from further tests.

2. Correlations between independent variables were then checked to ensure there is no multicollinearity which could negatively impact the results.

3. The correlated independent variables were then put into a regression model to confirm its fit into the final model.

To further validate the finding, a step wise regression and backward regression analysis was done. All three tests concluded with the same result.

Once the variables to be used were confirmed it was applied to the second sample of data. The following steps were followed to test the model:

1. The Kolmogorov-Smirnov test was used to test for normality in distribution in relation to the three variables (share growth, dividend yield and price-earnings) to determine whether a parametric or non-parametric test for the correlations was required. This test was used as the sample size was greater than 50.

2. As the data was found to be normally distributed, the Pearson's correlation was applied to ascertain the correlation between the predicted values and the actual values.

6. Limitations

There are always a number of limitations when comparing financial and non-financial information for companies. Some of these limitations are outlined in this section.

1.1. Availability of data

Based on studies mentioned in the literature review, ideally a minimum of ten years is required to determine growth in investment on the stock exchange, however, due to

limited data available on the ESG rating across the various exchanges, data from three years ago was used. This resulted in a small sample and therefore may result in obscured results and the introduction of inconsistencies into the model thus rendering the model unreliable.

In recent years, stock exchanges have been a driving force behind sustainability reporting by making the reporting of listed company's environmental, social and corporate governance (ESG) actions part of its listing requirement.

A report developed by The Association of Chartered Certified Accountants (2014), based on ten stock exchanges in Sub-Saharan Africa, provides a view of the information available across the various stock exchanges, based on the listing requirements of each.

The following table outlines the number of companies which have provided sustainability reporting across the different African exchanges:

Table 7: SSA Stock exchanges with companies reporting on sustainability (ACCA, 2014)

Stock exchange	No of companies
Johannesburg Stock Exchange	113
Nairobi Stock Exchange	4
Nigerian Stock Exchange	4
Zimbabwe Stock Exchange	2
Uganda Stock Exchange	1
Botswana Stock Exchange	1
Lusaka Stock Exchange	1

South Africa, as a result of the Johannesburg Stock Exchanges' listing requirement, had the highest level of reporting covering environmental, social and corporate governance aspects (ACCA, 2014; Minney, 2010). This is a clear indicator that emerging economies

are still in the early adoption stages where non-financial reporting is concerned and it would most likely take much longer before drastic changes in this arena is seen.

1.2. Accounting policies

Accounting policies and standards, for example, Generally Accepted Accounting Principles (GAAP), International Financial Reporting Standards (IFRS) and Sarbanes-Oxley (SOX) adopted across countries may differ and therefore using stocks from too many stock exchanges introduces noise and can result in incomparability between companies (Boumphrey & Bevis, 2013).

1.3. Currency conversion

Currency conversions can distort trends especially where there has been a significant devaluation of the currency resulting in a loss on investment (Aguiar, 2005; Claessens, Klingebiel, & Schmukler, 2002). For purposes of this study, currency was standardised to South African Rand (ZAR) and exchange rate used was as at the closing date of the share price.

1.4. Other factors

Other factors which are not taken into account in this study are transaction fees, taxes and management fees, which an investor would need to consider when investing on the stock market (Busse, Goyal, & Wahal, 2014).

CHAPTER 5:   RESULTS

Revisiting the aim of this research to build a simple valuation model which can be used to quickly assess a company's stock, using financial and non-financial measures, to determine whether it is a good investment, a number of correlations and regressions were run on each financial and non-financial measure to determine which one had an impact on the return of the stock. The return on the stock was determined by calculating its compound annual growth rate from 2011 to 2013 – a 36 month period.

This chapter is divided into two main sections. The first section covers a summary of the two datasets used, the first to develop the model and the second to test the model. The second section covers the statistical results from tests run on both samples.

1. Data selection

Two samples were required for this research, one to develop the model and another to test the model. In order to identify specific companies to include in both samples, purposive sampling (Saunders & Lewis, 2012, p. 138) was applied by following the steps below:

1. Based on the literature review, a period of ten years or more is ideal for determining return on investment for value stocks. Data was extracted for the period 2003 to 2013.

2. The maximum and minimum numbers of years of available data per company, financial and non-financial, was ascertained through a basic elimination process by removing any company with errors or where no data was available. For example, a company may have had 11 years of financial data, however, only the last two years had ESG ratings (non-financial data), hence the last two years qualified to be a candidate for the final sample.

3. The currency was standardised to South African Rand (ZAR) and calculated by Thomson Reuters Datastream using the presiding exchange rate at that point in

time. 2012 represents the largest sample which has a history of a complete set of data.

4. Outliers were removed from the sample to reduce the possibility of obscuring test results. Two South African companies were removed from sample one as their results were extreme outliers and this negatively obscured the tests. These two companies were replaced by two random companies from second sample to ensure the sample size remains consistent and larger than the test sample.

5. The number of companies per exchange qualified to form part of the sample is summarised in **Table 8**.

Table 8: Companies selected through a process of elimination

Country	Stock Exchange	No of companies
Brazil	BM&F BOVESPA	8
Russia	Russian Trading System	0
India	National Stock Exchange	70
China	Shanghai Stock Exchange	1
South Africa	Johannesburg Stock Exchange	111
TOTAL		190

6. Brazil and China were removed as the number of companies available in these markets were insignificant, reducing the sample to 181 companies.

7. The first sample, which contained 91 companies, was used to develop the model and second sample, which contained 90 companies, was used to test the sample.

The companies were extracted alphabetically from the Datastream database. From the final combined list, the split was through systematic sampling (Saunders & Lewis, 2012, p. 136) by selecting every second record to be included in each sample, thus sample one has all even numbered records, whilst sample two has odd numbered records.

2. Selecting the variables for the model

2.1. Frequencies and descriptives

A total of 91 companies were selected as part of the first sample to develop the model (hereafter referred to the "model sample"), 36 of which were listed on the National Stock Exchange (India) and 55 from the Johannesburg Stock Exchange (South Africa).

Average returns as measured by the growth in share price, was 23% and ranged between 0 and 45%. 45% of the shares in sample had shown return over 23% between 01 January 2012 and 31 December 2013. The average P/E ratio was relatively high at 17.1, whilst the average DY, P/B and P/S ratio were relatively low. The P/E ratio ranged between 8.2 and 26; DY between 0.9 and 4.4; P/B between 0 and 6.6; and P/S between 0 and 6.5.

The average ESG score were low, however the range for each was rather broad. Environmental scores ranged from 18.9 and 78.9; social scores ranged between 33 and 91.7; and corporate governance score between 18.7 and 72. Considering that reporting on the non-financial items is only mandatory in South Africa, one would expect some scores to be low in comparison to each company's competitors.

An overview of the descriptive statistics can be seen in Figure 5.

**Figure 5: Descriptive summary of data used for developing the model**

Statistics

	N		Mean	Median	Mode	Std. Deviation	Minimum	Maximum
	Valid	Missing						
ShPrice Share Price (ZAR)	91	0	72.027	42.530	1.000[a]	87.244	1.00	500.00
ShGrowth Share Growth (ZAR)	91	0	.209	.199	-.227[a]	.196	-.22655	.76158
PriceEarn Price Earning Ratio	91	0	17.108	15.000	10.600	8.942	2.9	43.2
DivYield Dividend Yield	91	0	2.665	2.400	.000	1.816	.00	7.59
PriceBook Price to Book Value	91	0	3.196	1.930	1.620	3.457	.31	23.63
PrSalShare Price/Sales per Share Ratio	91	0	2.543	1.560	.530	3.969	.23	34.19
EnvScore Environmental Score	91	0	48.761	44.700	10.220[a]	30.310	9.35	93.81
SocScore Social Score	91	0	61.786	72.070	77.220[a]	29.580	4.21	96.36
CorGScore Corporate Governance	91	0	44.826	49.690	50.870	27.170	1.9	93.4

a. Multiple modes exist. The smallest value is shown

2.2. Distribution of values

Due the sample size being larger than 50 cases, the Kolmogorov-Smirnov test was run to determine whether each of the three variables, PE, DY and returns, are normally distributed or not. Based on the histogram in Figure 6, all three variables were found to have a p-value > 0.05 and are therefore normally distributed and therefore a parametric test was used to develop the model using the Pearson correlation.

Figure 6: Histogram to determine normality

Dependent Variable: Share Growth (Return)(%)

Mean = -4.25E-16
Std. Dev. = 0.989
N = 91
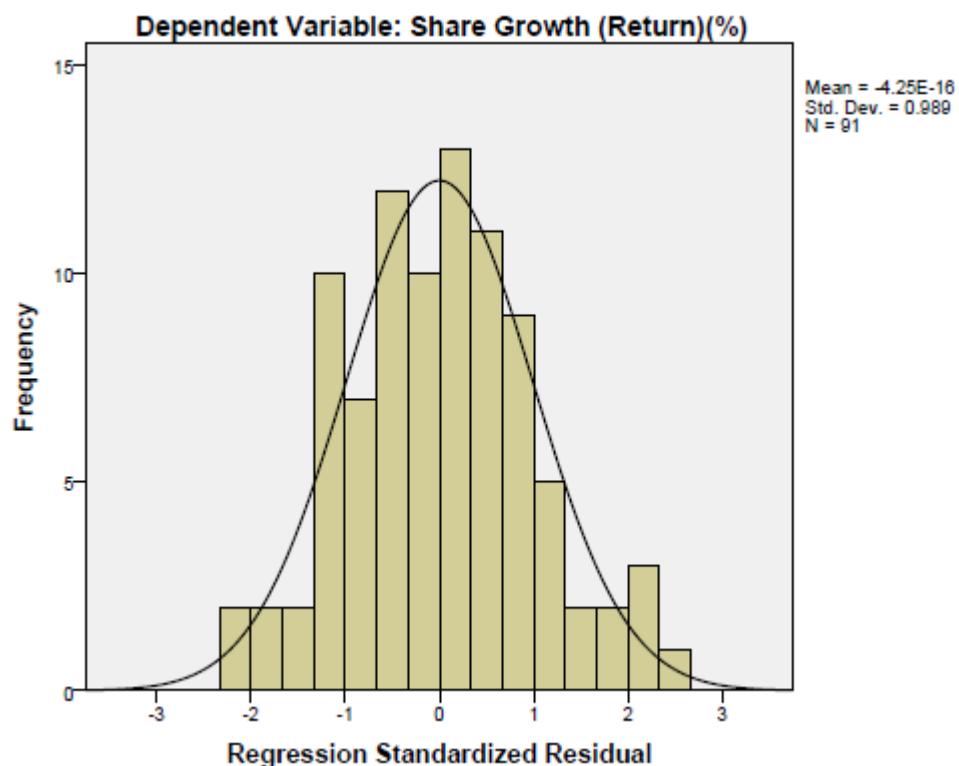
2.3. Correlations between independent and dependent variables

The relationship between returns (as measured by the growth in share price) and each financial ratios (as measured by P/E, DY, B/B and P/S ratios) and non-financial scores (as measured by the environmental, social and corporate governance rating) was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Figure 7 below provides a view of the results.

Figure 7: Correlation result between return (growth in share price) each variable listed to develop the model

		ShGrowth	Exchange	PriceEarn	DivYield	PriceBook	PrSalShare	EnvScore	SocScore	CorGScore
Correlations										
Pearson Correlation	ShGrowth	1.000	-.130	.229	-.237	.070	.089	.006	-.078	-.114
	Exchange	-.130	1.000	.022	.469	-.073	.037	.044	.279	.582
	PriceEarn	.229	.022	1.000	-.267	.657	.121	.011	.031	-.040
	DivYield	-.237	.469	-.267	1.000	-.052	.012	.053	.101	.282
	PriceBook	.070	-.073	.657	-.052	1.000	.042	.225	.209	.051
	PrSalShare	.089	.037	.121	.012	.042	1.000	-.249	-.383	-.304
	EnvScore	.006	.044	.011	.053	.225	-.249	1.000	.780	.495
	SocScore	-.078	.279	.031	.101	.209	-.383	.780	1.000	.631
	CorGScore	-.114	.582	-.040	.282	.051	-.304	.495	.631	1.000
Sig. (1-tailed)	ShGrowth		.110	.014	.012	.254	.201	.478	.231	.142
	Exchange	.110		.417	.000	.246	.363	.340	.004	.000
	PriceEarn	.014	.417		.005	.000	.126	.459	.384	.352
	DivYield	.012	.000	.005		.314	.457	.308	.171	.003
	PriceBook	.254	.246	.000	.314		.346	.016	.024	.316
	PrSalShare	.201	.363	.126	.457	.346		.009	.000	.002
	EnvScore	.478	.340	.459	.308	.016	.009		.000	.000
	SocScore	.231	.004	.384	.171	.024	.000	.000		.000
	CorGScore	.142	.000	.352	.003	.316	.002	.000	.000	

Based on a 95% confidence interval, there was a weak negative correlation between DY and returns, $p = 0.012$ (<0.05), $r = -0.237$ and $n = 91$ implying an inverse relationship between the variables (Figure 8). There is a weak positive correlation between the PE and returns, $p = 0.014$, $r = 0.229$ and $n = 91$.

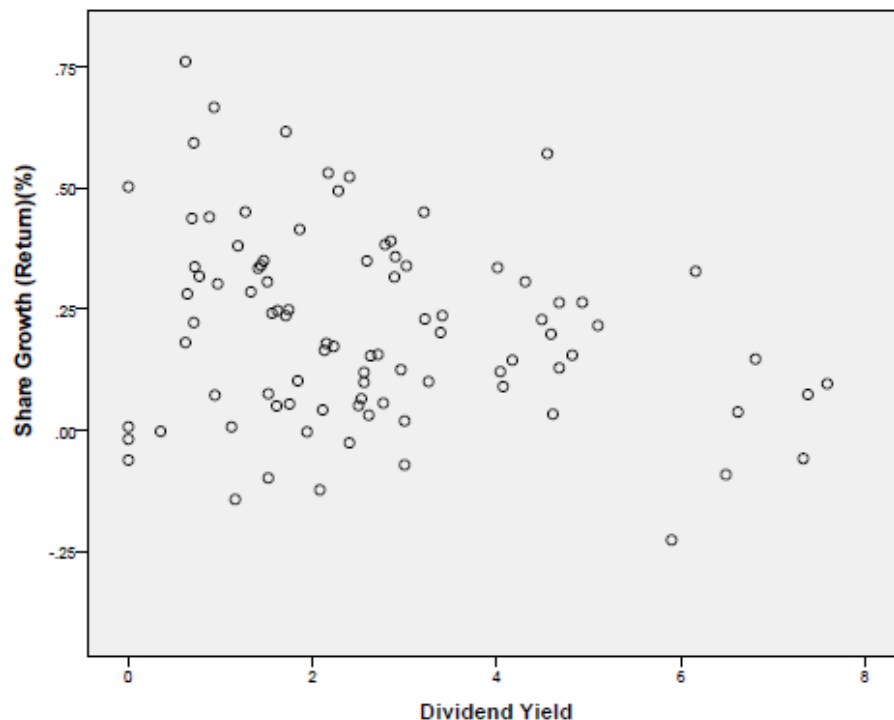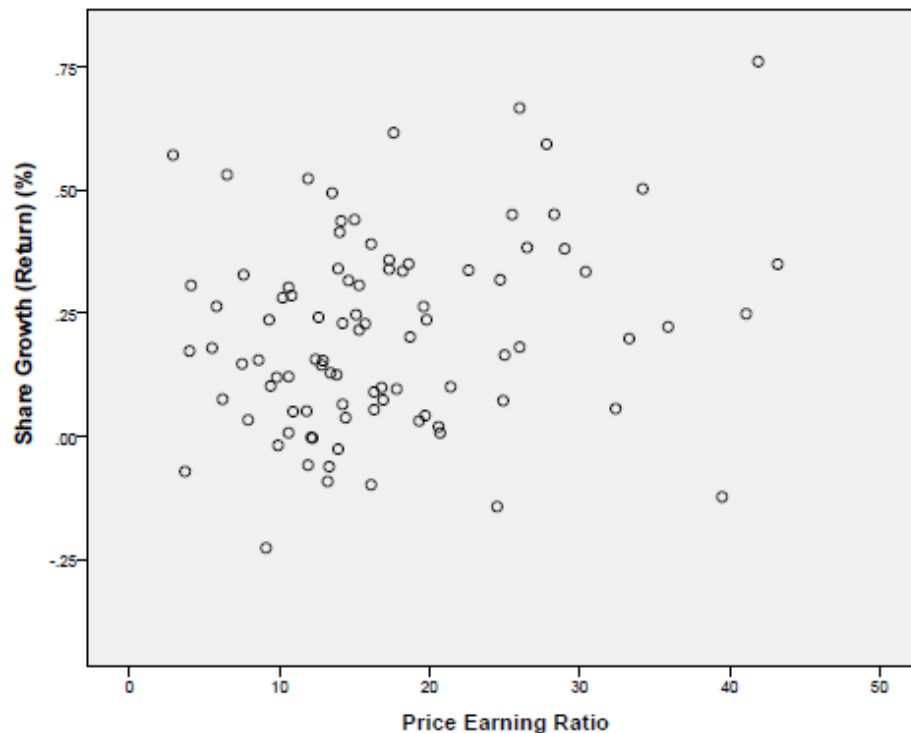**Figure 8: Scatter plot showing correlation between returns and DY**

Figure 9: Scatter plot showing correlation between returns and P/E ratio

None of the non-financial variables are shown to be statistically correlated to the return as the p-value > 0.05 for all these variables and are therefore omitted from the model.

There is no evidence of multicollinearity between the qualifying ratios as seen in Figure 7, with p < 0.05 for both variables.

A number of scatter plots were developed to visually decipher the correlation between the return and each independent variable, both financial and non-financial. The results are visually displayed in the graphs below. Based on the correlations, these variables have been omitted from the model.

2.4. Correlation between returns and remaining variables which do not qualify for inclusion into the model

A test was run to see if a relationship existed between the returns and the exchange on which the share traded. From Figure 10, it can be concluded that there is no

correlation as the returns on both exchanges are in approximately the same range. This factor will therefore be discounted from the model. This is validated in Figure 7 where p = 0.110 and r = -0.13.

Figure 10: Scatter plot showing correlation result between return and Stock exchange
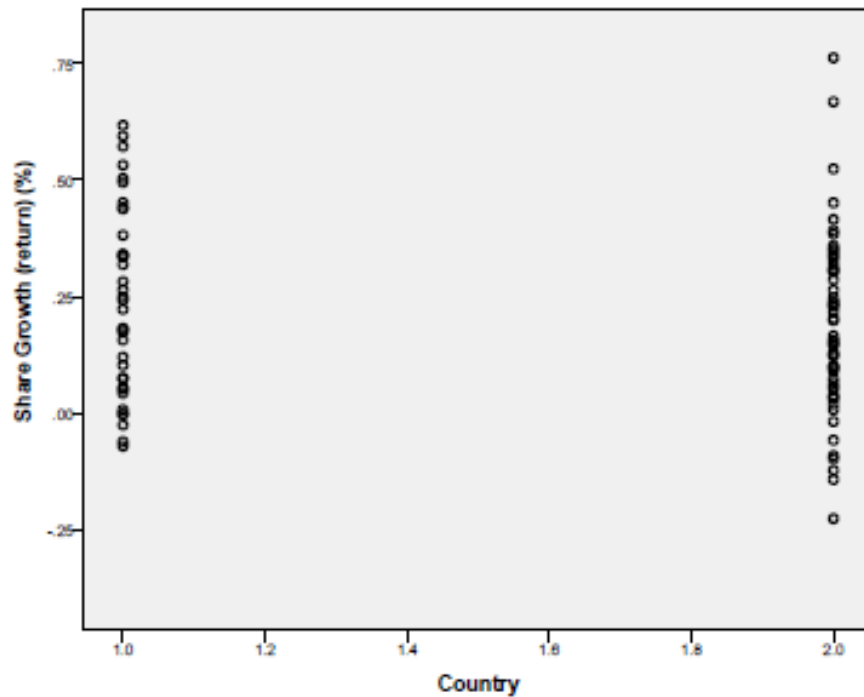
From the scatter plot in Figure 11, it is apparent the there is no correlation between the return and PB ratio. P-value = 0.254 and r = 0.7. The one outlier could be an indication of a mispriced or overvalued share based only on it PB ratio.

Figure 11: Scatter plot showing correlation between return and PB
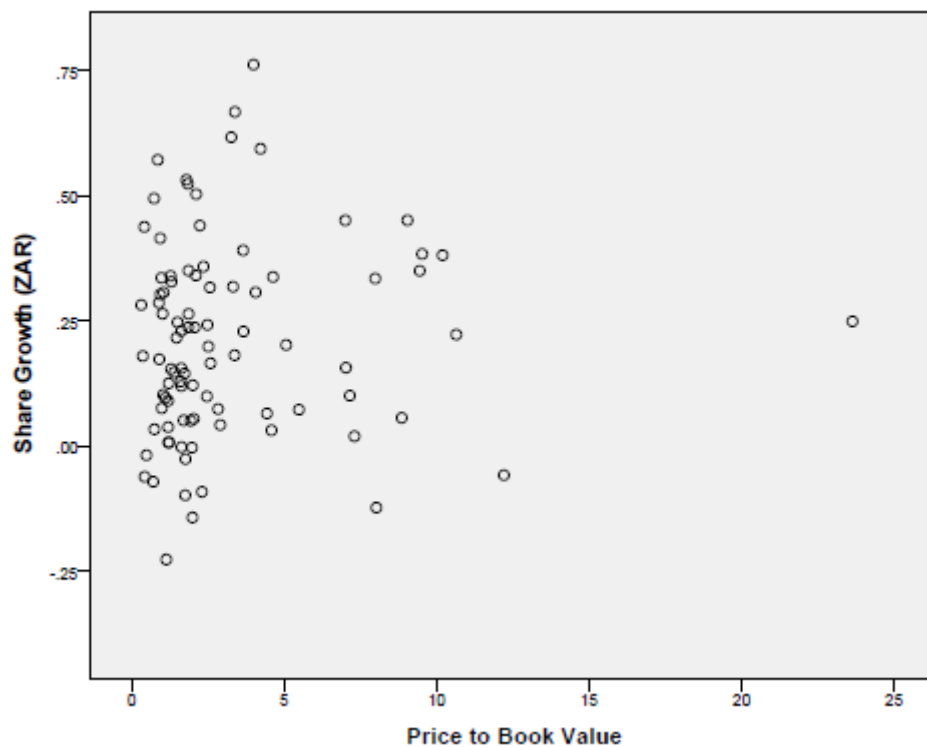

Figure 12 shows no correlation between the return and PS ratio as p = 0.201 and r = 0.089. The outlier, a South African company, seems to be an overvalued stock.

Figure 12: Scatter plot showing correlation between return and PS
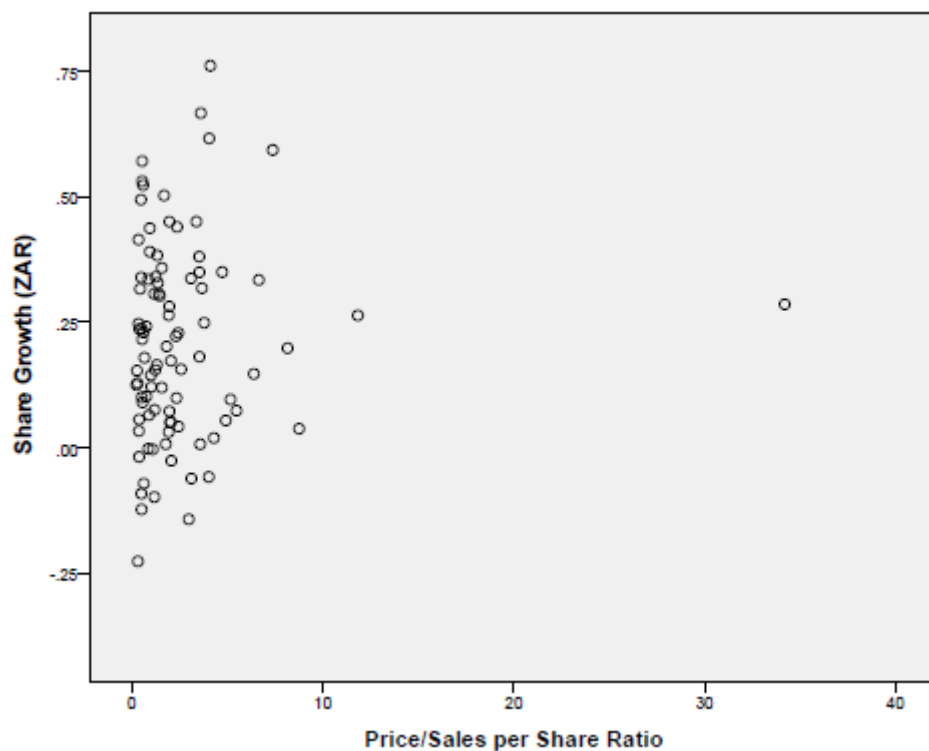
Figure 13 to Figure 15 shows that irrespective of the number of companies reporting on its non-financial information relating to environment, social and corporate governance requirements, the impact on return is not seen in the form of correlation. Environmental score: p-value = 0.478 and r = 0.006; Social score: p-value = 0.231, r = -0.78; and Corporate Governance score: p-value = 0.142 and r = -0.114.

Figure 13: Scatter plot showing correlation between return and environmental score

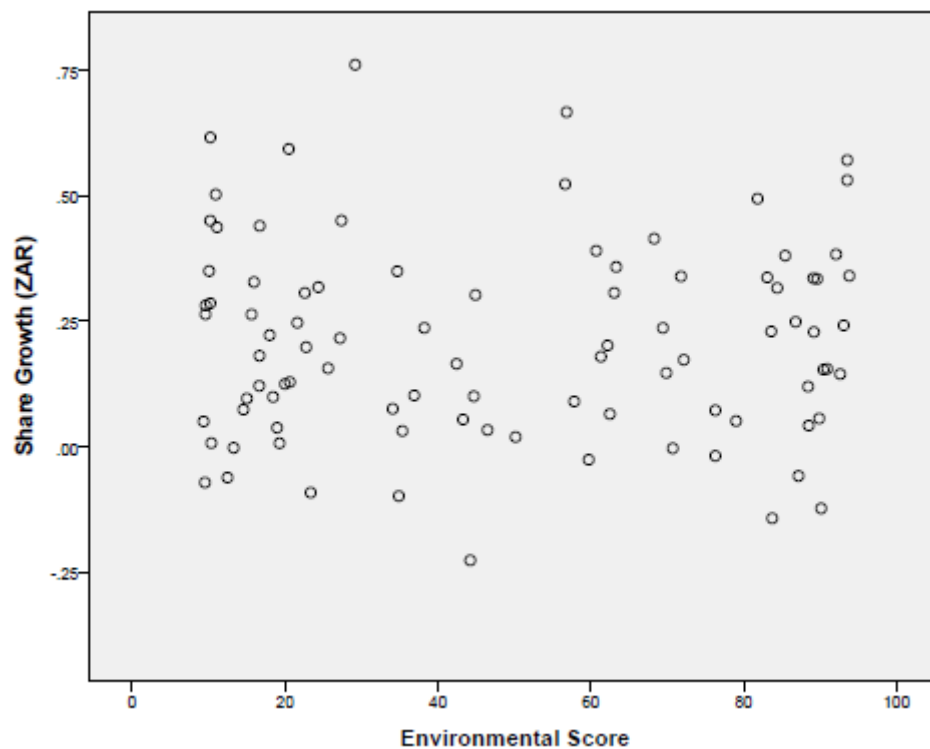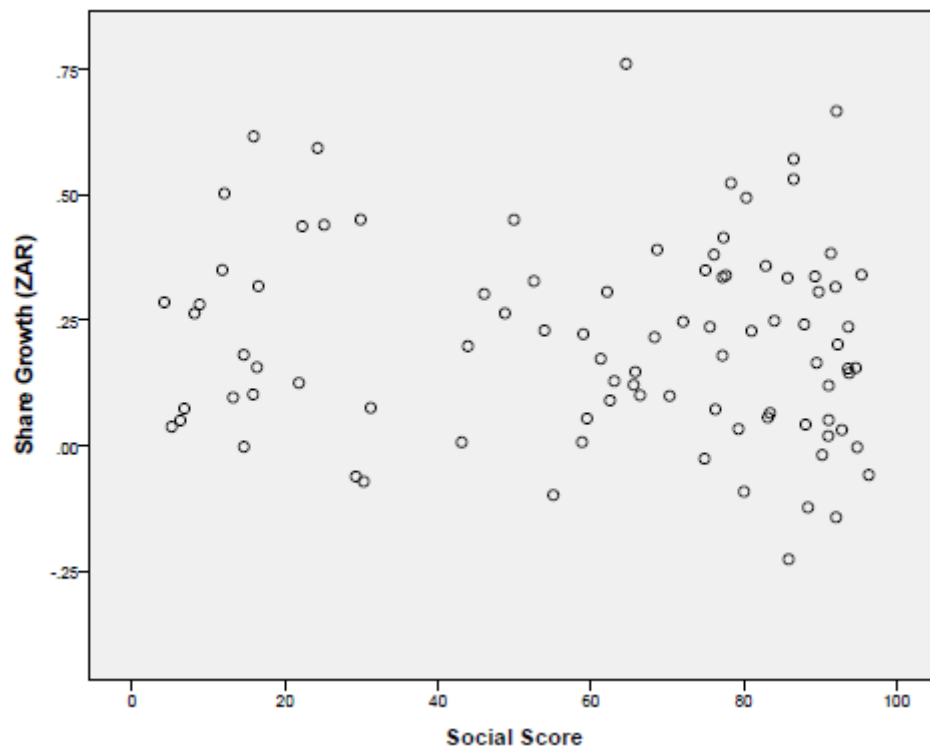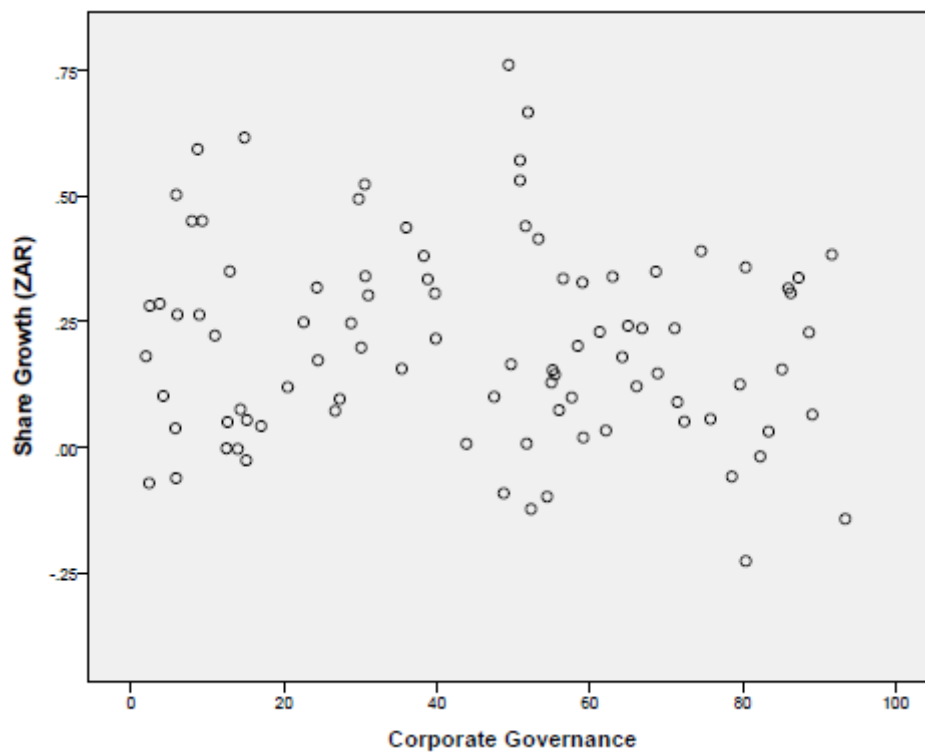**Figure 14: Scatter plot showing correlation between return and social score**

Figure 15: Scatter plot showing correlation between return and corporate governance score

2.5. Results from the multiple regression of the qualifying variables

Standard multiple regression was used to assess the ability of the price-earnings ratio and dividend yield to identify undervalued shares to invest in. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. The total variance explained by the model as a whole was 8.6%, $F(2, 4.139) = 4.139$, $p< .05$. Based on the collinearity statistics (VIF and tolerance) in Figure 18, there is low possibility of multicollinearity.

Figure 16: Model summary with qualifying variables

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.293[a]	.086	.065	.190
a. Predictors: (Constant), DivYield, PriceEarn				
b. Dependent Variable: Share Growth (Return)				

Figure 17: ANOVA test based on PE and DY ratio

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.299	2	.149	4.139	.019[b]
	Residual	3.176	88	.036		
	Total	3.475	90			
a. Dependent Variable: Share Growth (Return)						
b. Predictors: (Constant), DivYield, PriceEarn						

Figure 18: Collinearity diagnostics table used to determine collinearity between independent variables

Collinearity Diagnostics[a]						
				Variance Proportions		
Model		Eigenvalue	Condition Index	(Constant)	PriceEarn	DivYield
1	1	2.591	1.000	.02	.02	.03
	2	.339	2.766	.00	.24	.50
	3	.071	6.043	.98	.74	.46
a. Dependent Variable: Share Growth (Return)						

3. Developing the model

The beta for dividend yield is -0.21 and for price-earning is 0.04 indicating that dividend yield makes the strongest unique contribution to explaining returns, however, based on the p-value = 0.76 it is insignificant. Based on the level of significance of both these variables in comparison to the calculated constant, the model can be defined as

Equation 9: Model for determining which share to invest in

$$\alpha = 0.197 + 0.004PE_x - 0.021DY_x$$

Where:

α = return on investment as measured by growth in share price

PE_x = price-earnings ratio of share x

DY_n = dividend yield of share x

Figure 19: Coefficients from multiple regression

		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.197	.060		3.301	.001					
	PriceEarn	.004	.002	.179	1.690	.095	.229	.177	.172	.929	1.077
	DivYield	-.021	.011	-.190	-1.793	.076	-.237	-.188	-.183	.929	1.077

a. Dependent Variable: Share Growth (Return)

4. Testing the model

To ensure the most relevant variables were selected, a stepwise regression and a backward regression where all the independent variables (not only the ones correlating with the dependent variable) were inserted into the model. Both the stepwise and backward regression confirmed that the PE and DY ratios, even though not significant, are the only variables which contribute to the model.

The second sample of 90 companies was used to test the model, of which 34 were listed on the National Stock Exchange (India) and 56 on the Johannesburg Stock Exchange (South Africa).

4.1. Frequencies and descriptives on the test data

Based on statistics from **Error! Reference source not found.** and Figure 20, there is no significant differences between the datasets.

Figure 20: Statistical overview of the test sample

	N					Std.		
	Valid	Missing	Mean	Median	Mode	Deviation	Minimum	Maximum
ShPrice Share Price (ZAR)	90	0	69.720	36.660	2.550ᵃ	93.524	2.55	622.53
ShGrowth Share Growth (ZAR)	90	0	.208	.181	-.402ᵃ	.231	-.40171	.90384
PriceEarn Price Earning Ratio	90	0	16.027	13.900	9.400	8.272	2.8	47.4
DivYield Dividend Yield	90	0	2.687	2.355	0.000	1.953	0.00	8.12
PriceBook Price to Book Value	90	0	3.080	2.280	1.070ᵃ	3.194	.22	21.65
PrSalShare Price/Sales per Share Ratio	90	0	2.243	1.660	1.390	2.266	.14	16.27
EnvScore Environmental Score	90	0	46.442	39.055	9.380ᵃ	29.673	9.38	93.78
SocScore Social Score	90	0	60.211	63.860	5.430ᵃ	28.926	5.43	96.72
CorGScore Corporate Governance	90	0	43.734	44.255	1.880ᵃ	25.310	1.88	90.97

a. Multiple modes exist. The smallest value is shown

Before attempting any correlations on the test data, normality of the sample was established. All independent variables with the exception of PE and DY were omitted from further testing as they did not qualify to form part of the model. Therefore, descriptives for each variable was split as follows:

The share growth as the dependent variable (referred to as "ShGrowth in

1. Figure 22)

DY as referred to in

2. Figure 22 as "Predict_ShGrowth1"

DY and PE as referred to in

3. Figure 22 as "Predict_ShGrowth2".

The Kolmogorov-Smirnov test was run to then determine normality of the three variables. This test was selected as the number of test cases in the sample was greater than 50 and this is indicated by the degree of freedom or "df" in Figure 21. From the tests of normality (Figure 21), it is clear from the p-values that all three variables are normally distributed as all three variables have a significance of greater than 0.05

(p>0.05) and therefore have symmetrically normal distributions. This is confirmed by the histograms in Figure 23, Figure 24 and Figure 25.

Figure 21: Normality tests conducted on the 3 qualifying variables (P/E, DY and Share growth)

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ShGrowth	.074	90	.200[*]	.974	90	.064
Predict_ShGrowth1	.087	90	.087	.938	90	.000
Predict_ShGrowth2	.052	90	.200[*]	.988	90	.565

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure 22: Descriptives on test dataset, broken down by dependent and independent variables which qualified to be included in the model

Descriptives

			Statistic	Std. Error
ShGrowth	Mean		.208	.024
	95% Confidence Interval for Mean	Lower Bound	.159	
		Upper Bound	.256	
	5% Trimmed Mean		.202	
	Median		.181	
	Variance		.053	
	Std. Deviation		.231	
	Minimum		-.402	
	Maximum		.904	
	Range		1.306	
	Interquartile Range		.269	
	Skewness		.435	.254
	Kurtosis		1.189	.503
Predict_ShGrowth1	Mean		.208	.005
	95% Confidence Interval for Mean	Lower Bound	.197	
		Upper Bound	.219	
	5% Trimmed Mean		.211	
	Median		.217	
	Variance		.003	
	Std. Deviation		.051	
	Minimum		.067	
	Maximum		.278	
	Range		.211	
	Interquartile Range		.061	
	Skewness		-.803	.254
	Kurtosis		.267	.503
Predict_ShGrowth2	Mean		.205	.006
	95% Confidence Interval for Mean	Lower Bound	.193	
		Upper Bound	.217	
	5% Trimmed Mean		.204	
	Median		.199	
	Variance		.003	
	Std. Deviation		.057	
	Minimum		.079	
	Maximum		.382	
	Range		.303	
	Interquartile Range		.070	
	Skewness		.285	.254
	Kurtosis		.475	.503

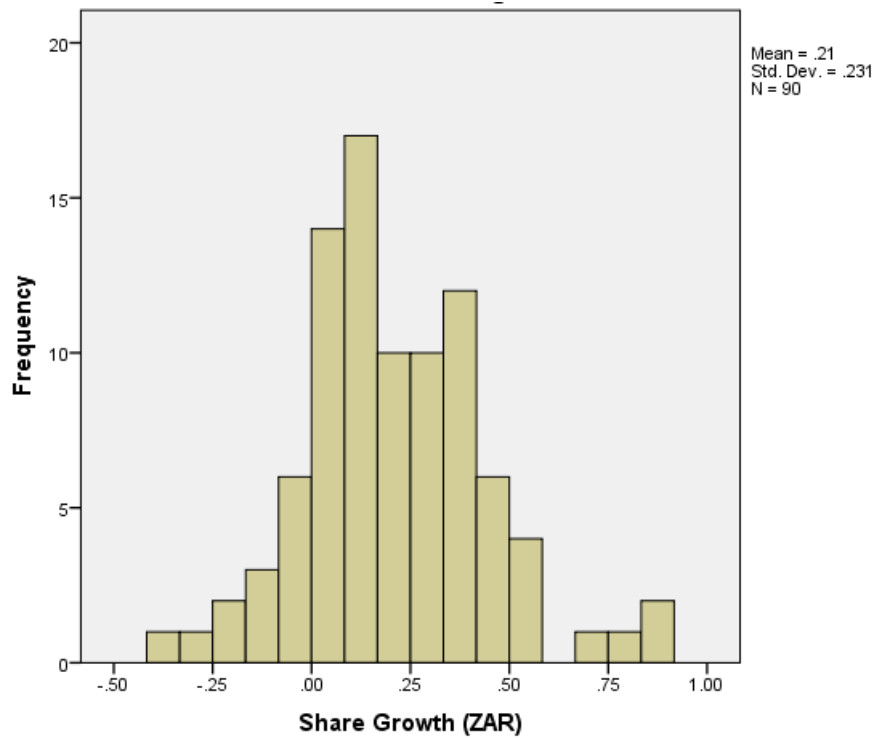**Figure 23: Histogram showing the distribution of the dependent variable, thus proving normality**

Mean = .21
Std. Dev. = .231
N = 90

Figure 24: Histogram showing normal distribution of DY as the independent variable
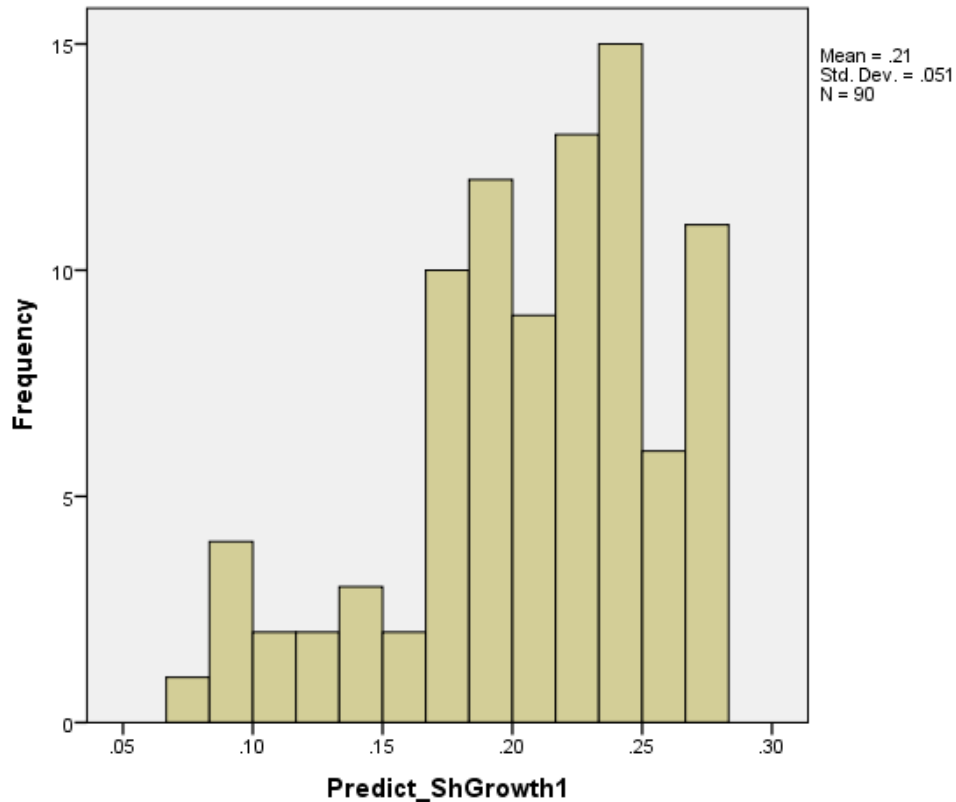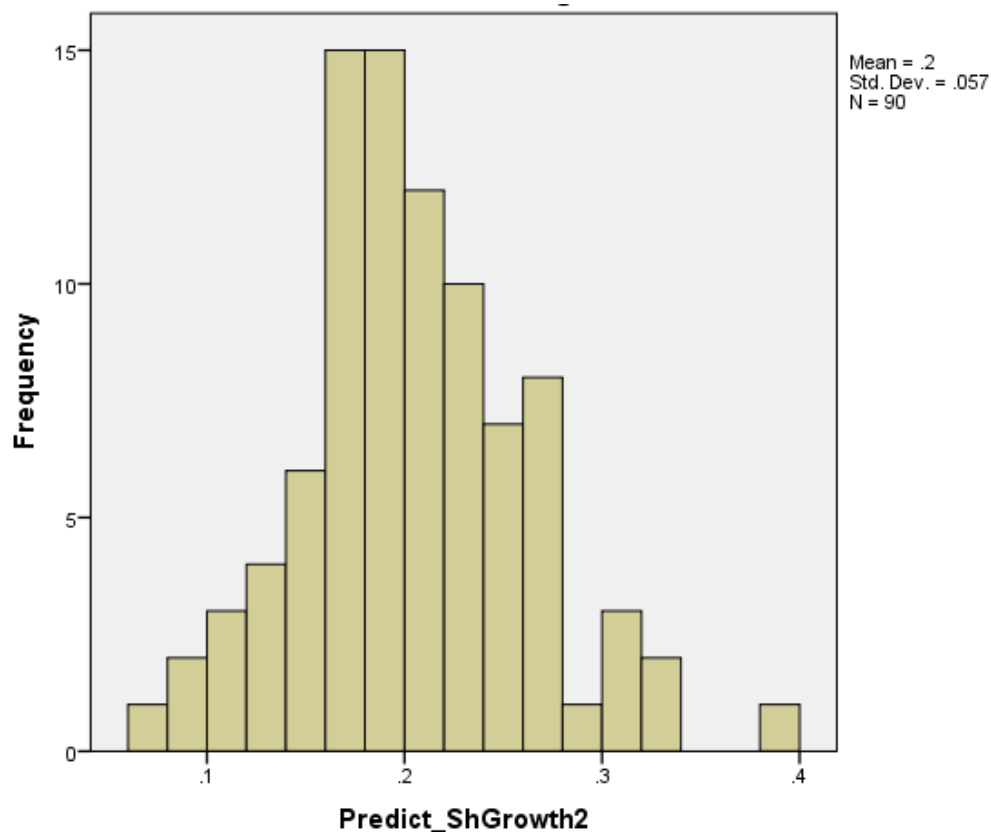

Mean = .21
Std. Dev. = .051
N = 90

Figure 25: Histogram showing normal distribution of DY and PE as the independents variable

Based on the results of the normality tests, that is the sample was found to be normally distributed, further parametric tests were carried out.

A correlation was run on the three variables, share growth, dividend yield and price-earnings. The results are summarised in Figure 26 where it is clear based on the significance values were greater than 0.05. In other words, Predict_ShGrowth1 (DY only): p = 0.127 and Predict_ShGrowth2 (DY and P/E): p = 0.133.

Figure 26: Summary of results based on correlations between the final three variables selected to form part of the model

Correlations

		ShGrowth	Predict_ShGrowth1	Predict_ShGrowth2
ShGrowth	Pearson Correlation	1	.162	.160
	Sig. (2-tailed)		.127	.133
	N	90	90	90
Predict_ShGrowth1	Pearson Correlation	.162	1	.821**
	Sig. (2-tailed)	.127		.000
	N	90	90	90
Predict_ShGrowth2	Pearson Correlation	.160	.821**	1
	Sig. (2-tailed)	.133	.000	
	N	90	90	90

**. Correlation is significant at the 0.01 level (2-tailed).

In conclusion, it is clear that the dividend yield and price-earnings ratio are the only two financial ratios which have some credibility in predicting share growth and the non-financial indicators which is the ESG ratings, has shown not to have any impact on the growth of the share.

CHAPTER 6:   DISCUSSION

The aim of this study was to explore the possibility of developing a simple valuation model which could be used by an investor for purposes of selecting shares based on a number of financial and non-financial variables. Following a thorough review of the empirical studies, the financial ratios selected for purposes of the study were: (1) the price-earnings ratio; (2) the dividend yield; (3) the price-to-sales ratio; and (4) the price-to-book ratio. The non-financial variables selected include the scoring of the non-financial information as per Reuters ASSET4 classification, that is, (1) the environment score; (2) social score; and (3) the corporate governance score.

The results of the tests supports the conclusions made by various studies in as far as it related to the limitation of non-financial information evident even amongst developed nations, for example, Russia. Albeit not a criteria for the development of the model, the results do provide an insight into the misconceptions pertaining to the advancements in some emerging markets in relation to development markets. This is evident in the availability of data as outlined in **Table 8**. Furthermore, information contained in **Table 8** clearly demonstrates the substantiation for emerging markets yielding higher returns.

This chapter analyses the results from chapter 5 in relation to the literature review in chapter 2. The results in chapter 5 have revealed that the development of a rudimentary model is not as simple as the selection of a number of variables, but rather requires an understanding of financial instruments and markets over a period of time.

### 1. Findings on financial indicators

The overall finding from the regression analysis shows that only two of the four ratios are somewhat significant in determining share growth. These are further discussed below.

1.1. Price-to-earning (P/E) ratio

By dividing the P/E ratios into 10 deciles and ranking from lowest to highest, it is clear that over the 36 month period (Figure 27) the lowest P/E ratios generated a marginally higher returns in comparison to companies with high P/E ratios. This is strongly supported by the correlations run, which find a very weak correlation between the P/E ratio and the share growth. Whereas literature states that a low P/E ratio is an indicator of an undervalued stock, considering that 4% of the sample had a P/R which ranged between 0 and 4.3 – this may be an indicator that companies in this decile might be in financial distress as returns are low as well. A way to filter these companies out, would be to determine which one of these with a low P/E ratio has a high earnings per share (EPS) (Sareewiwatthana, 2012, 2013).

Referring back to the findings by Damodaran (2012), returns on value stocks were measured over a lengthy period in comparison to this study. This is most likely where the difference in findings emanate.

Figure 27: Annual average returns over 36 month period split by PE decile range
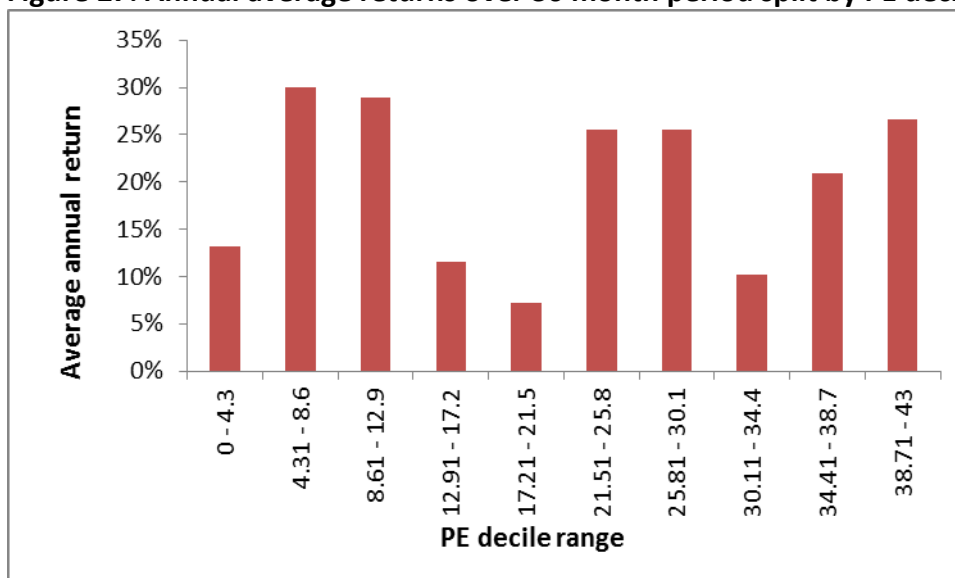
Based on the regression analysis, it was found that the correlation between the P/E ratio and the share growth was positive but weak (Pearson correlation = 0.229, p =

0.014) (Figure 28: Regression analysis showing weak positive relationship between the P/E ratio and share growth.

Figure 28: Regression analysis showing weak positive relationship between the P/E ratio and share growth
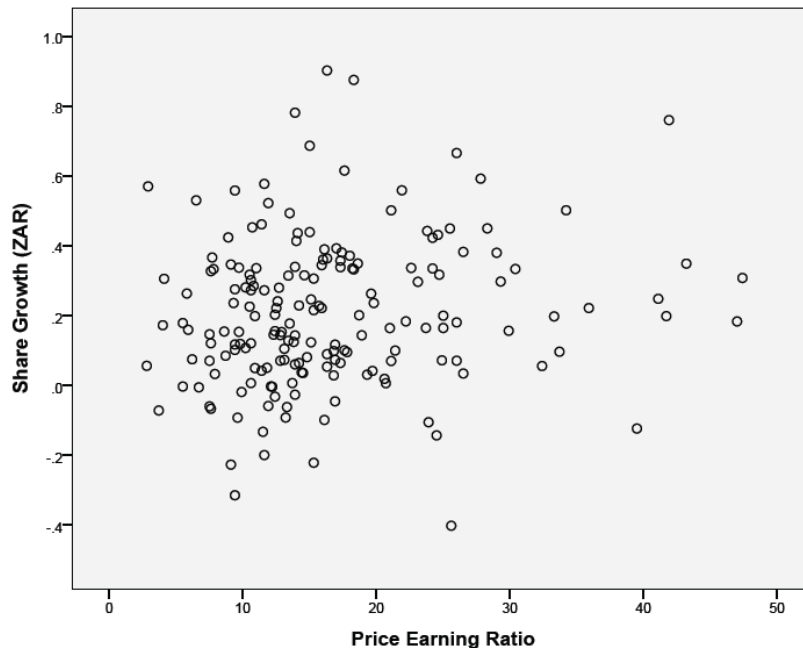

The P/E ratio can therefore been seen as a weak determent of share growth for an investor where the period is less than ten years, or in this case five.

1.2. Dividend yield (DY) ratio

According to findings, the DY had a weak negative correlation to the share growth, albeit higher than the P/E to share growth correlation (Pearson correlation = -0.237 and p = 0.012) (Figure 30).

By breaking down the DY into ten deciles, the graph in Figure 29 indicates that the average growth is higher for shares with a low DY as opposed to high dividend yield with a low growth rate. It should be noted that the number of companies with a low DY outweighed the number of companies with a high DY, in that 73% of companies had a dividend yield of less than 3.23, thus skewing results towards a weak negative correlation.

Figure 29: Average annual returns over the 36 month period divided into ten DY deciles
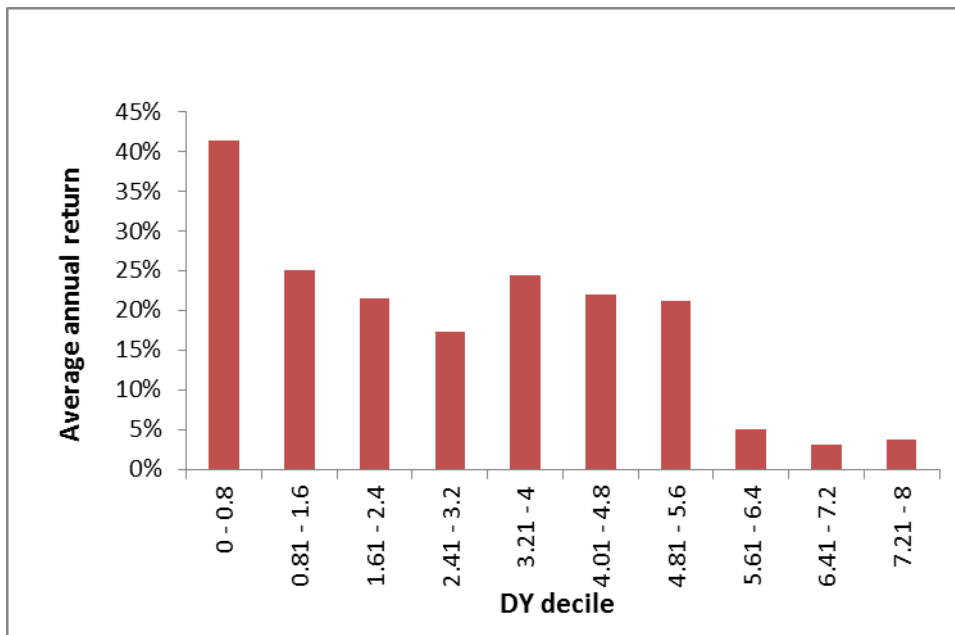
The sample size and variability of the sample has therefore limited and skewed the final results (Figure 30). Comparing to the study by Damodaran (2012) and Sareewiwatthana (2012), the timeframe interrogated was greater than 10 years, confirming the limitation in this study.

Figure 30: Regression analysis showing a stronger negative correlation between share growth and the dividend yield
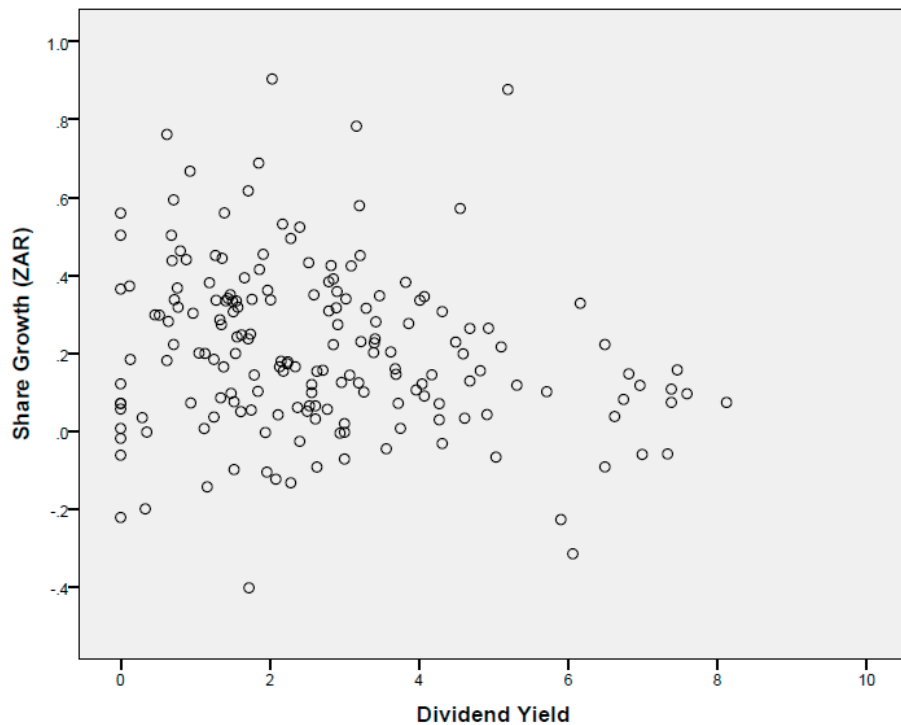
1.3. Price-to-sales (P/S) ratio

The scatter plot in Figure 32 clearly indicates that approximately 97% of the companies fall within the range of 0 and 12.02. The results demonstrate that there is no consistent correlation between the share growth and the P/S ratio. This conclusion is evident by the extreme movement between returns. In addition, no correlation between the share growth and P/S ratio was found where the Pearson correlation = 0.089 and the p-value = 0.201. The results however contradict the finding from the research undertaken by Chou and Liao (1996) and Sun (2012) which concluded that companies with low P/S ratios tend to beat overall market returns.

This study has measured the performance of each share not against the market, but in terms of growth of the share. However, it can be speculated that over a longer period the average return on shares with low P/S ratios may exceed the overall return of the market or a specific benchmark, taking into account that 97% of the shares had a

dividend pay-out of below 12.5 and the average growth of these shares is 23% (Figure 32).

A key difference between this study and that of Chou and Liao (1996) and Sun (2012) is that the period taken into consideration was 11 and 10 years respectively, as opposed to 36 months in the case of this study.

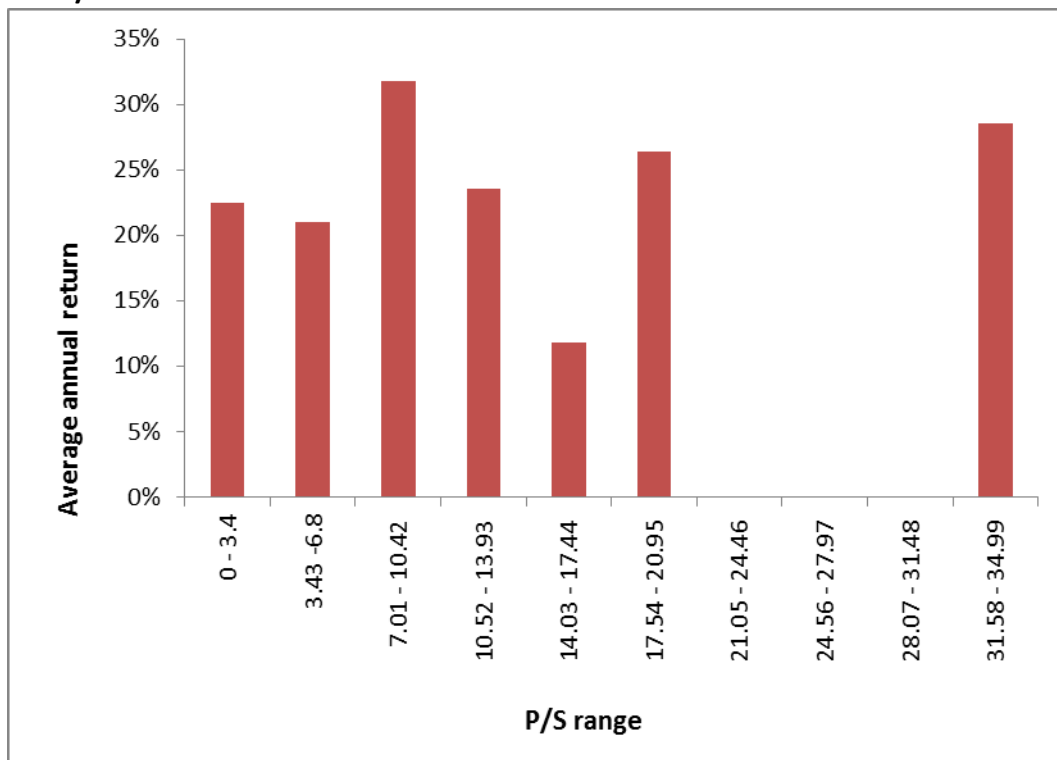**Figure 31: Average annual returns of shares over the 36 month period divided into ten P/S deciles**
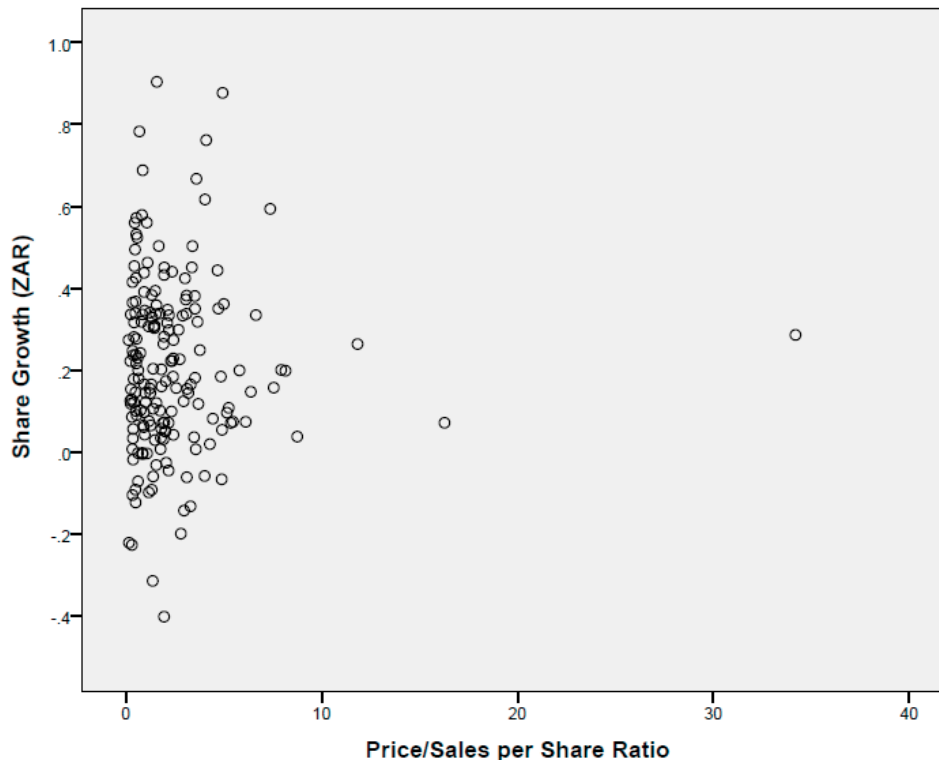
Figure 32: Scatter plot showing concentration of the P/S ratios in the lower range with no correlation to the share growth

1.4. Price-to-book value (P/BV) ratio

The results indicate that 62% of the companies fell in the lowest decile earning on average 21% return (Figure 33). This result validates the results depicted in the findings by Fama (1992) and Damodaran (2012). However, from the scatter graph in Figure 34, the result tends to indicate that a low P/B value fails to show any correlation with the growth share price. It also reveals that companies with a low P/B and low average annual return to be potentially in financial distress. Furthermore, in consideration for the short time period the assumed financial distressed situation could be as a result of the limited business lifecycle of these companies. This could not be inferred from the data used in this study due to the time frame applied. It speaks to reason that according Damodaran (2012) the companies risk related to leverage and its return on equity should be taken into consideration in this instance.

Figure 33: Average annual returns of shares over the 36 month period divided into ten P/B deciles
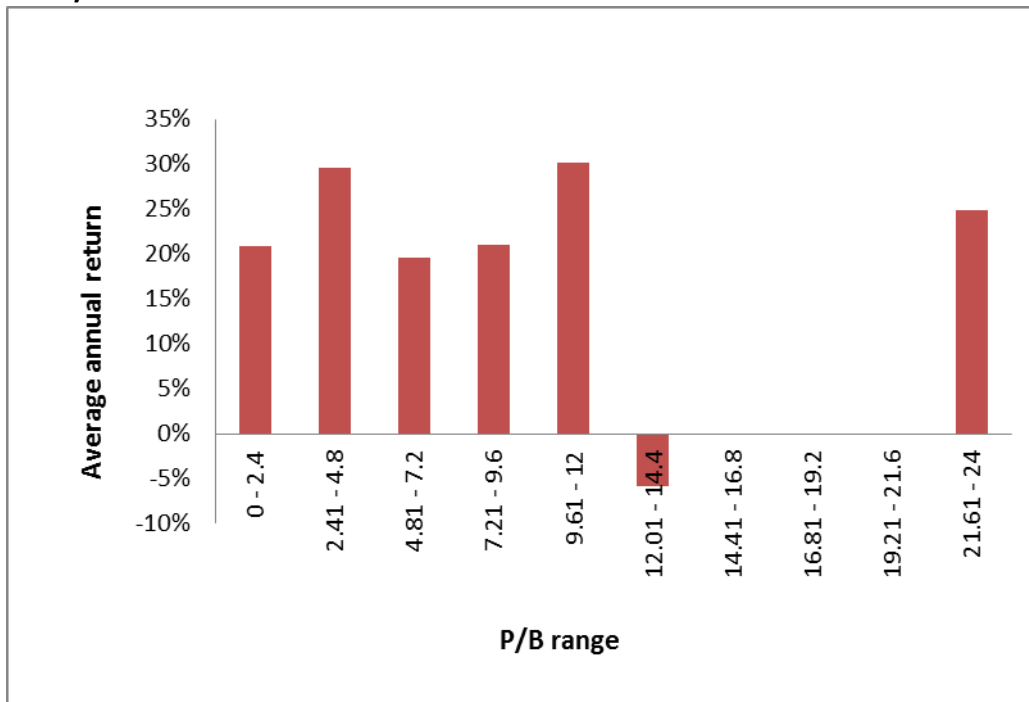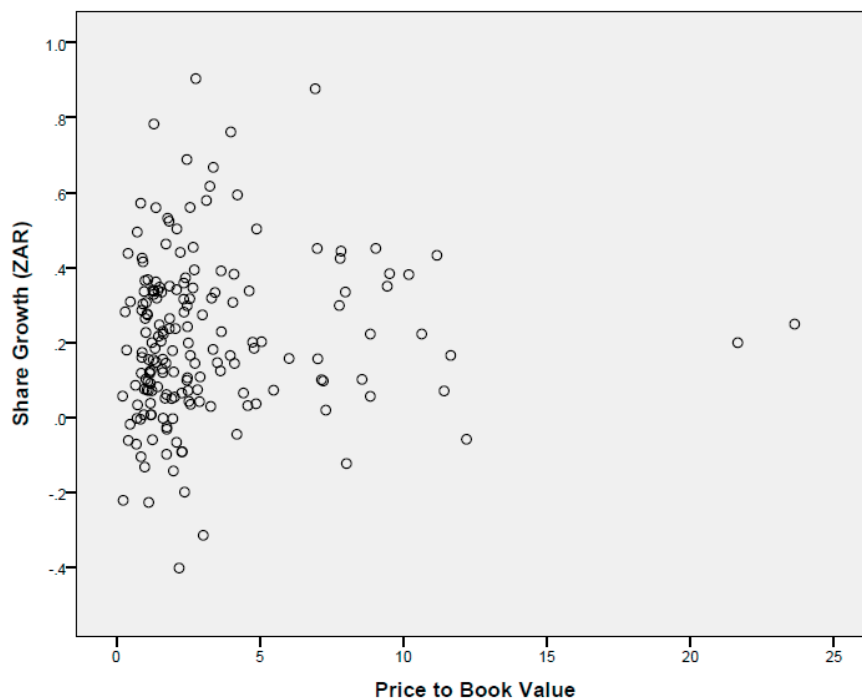

Figure 34: Scatter plot showing concentration of the P/B ratios in the lower range with no correlation to the share growth

In conclusion, it is evident that the time period of this study is the first glaring difference when compared to study reviewed in the literature review, supporting Damodaran (2012) view that a long period of data, preferable longer than a decade, is required to find a relationship between stock returns and financial results.

2. Findings on non-financial indicators

The multiple regression analysis has shown that all three non-financial ratings or scores had no correlation to the share growth, thus rendering these variables inadequate for inclusion into the final model. The results will be discussed in the following section.

It is worth noting that the concept of reporting specifically about non-financial information in specific formats as stipulated in corporate governance reports such as King III, is a relatively young practice and thus, companies are expected to be on a learning curve as adoption of the reporting requirement, although in South Africa is mandatory, remains largely optional in other countries. This is evident by the lack of ESG rating data in countries which are now regarded as global growing power-houses, for example Russia and China where no companies reported on these areas.

2.1. Environmental score

Figure 35 and Figure 36 visually confirms that there is no relationship between the average annual returns of stocks and the environmental scores which are awarded to companies. One could argue that the difference in environmental regulations or extent to which each company is required to satisfy, may impact the final scoring, especially when comparing companies across different stock exchanges or countries. For example, India's environmental obligations and reporting requirements may differ drastically to a company operating in South Africa, resulting in a difference in rating.

Figure 35: Average annual returns of shares over the 36 month period divided into ten environment score deciles
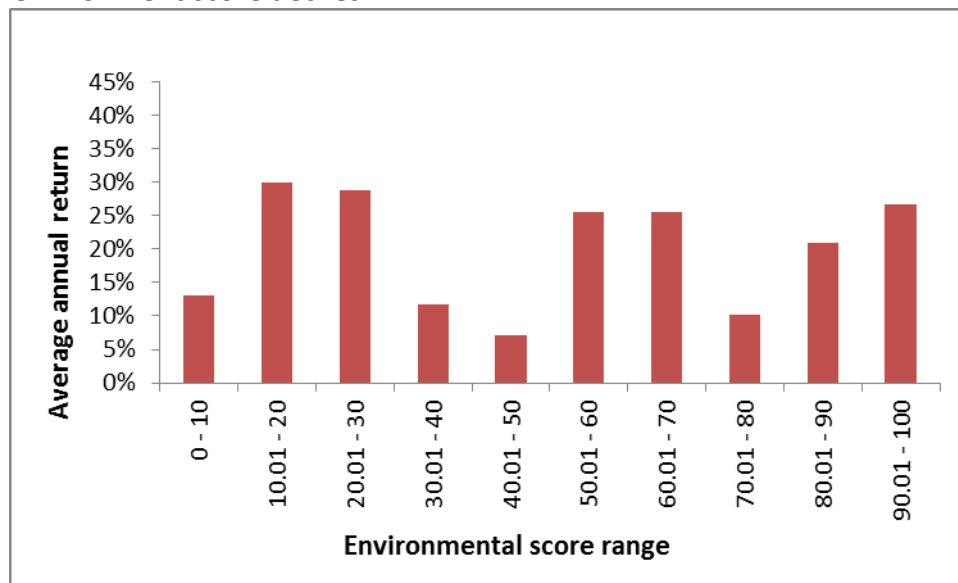

The Pearson correlation = 0.006, showing virtually no correlation between the environmental score of a company and the stock growth (Figure 36). Scores are scattered with majority of the result at opposite ends of the poles, that's is low (high) rating with high (low) returns, making it impossible to find any relationship between the variables.

It appears that the returns achieved by companies which invest heavily into reducing negative impacts on the environment benefit no more than those companies which choose to not invest, or invest considerably less. Alternatively, depending on the industry in which the company operates, investment requirements differ due to the difference in operating activities which could skew ratings overall if sections of the ratings were not customised by sector.

The conclusion is therefore brief – based on the short timeframe used for the study and due to the lack of data, it has been confirmed that over the short term, the environmental score has no impact on the share growth.

Figure 36: Scatter plot showing concentration of the environmental scores with no correlation to the share growth
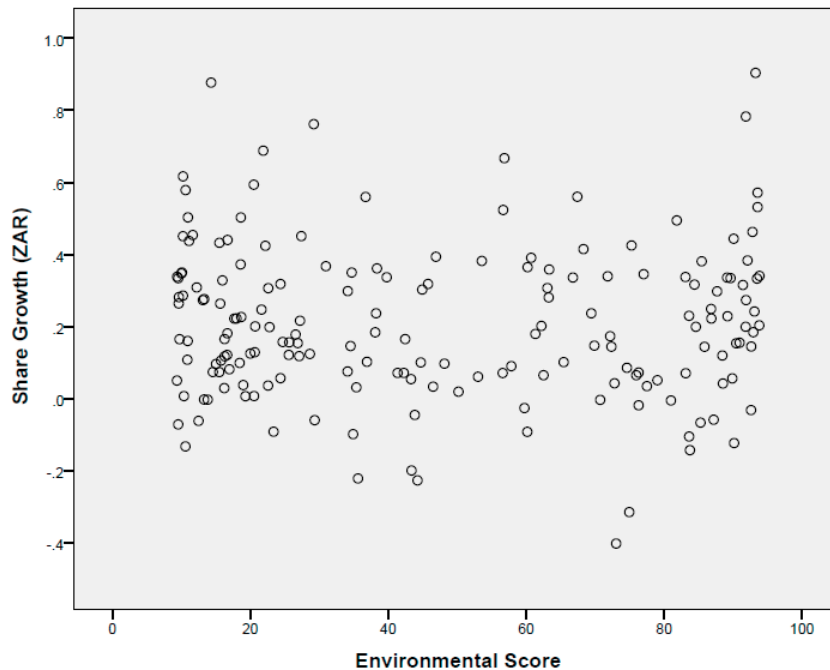
2.2. Social scores

The social score or rating is an indication of trust which the company has built with various stakeholders. This is measured through a few mechanisms, such as the loyalty of its workforce and customers and ability to generate shareholder returns. These definitions are broad and therefore allow companies to adopt practices which suite their agendas. The non-standardisation of definitions when reporting could therefore create many gaps and loopholes which could negatively impact the company's independent ratings.

Figure 37 and Figure 38 is clearly in contradiction with the theory which states that ESG ratings have a positive impact on the share growth. This study has proven that over the short-term, in this instance – three years, the social score or rating has no bearing on the growth of a share and cannot be used to identify stocks which have value.

If one were to speculate without using regressions and correlations, based solely on Figure 37, a bet could be put on the companies in the upper decile ranges, assuming

that results from investment undertaken will only bear fruits in the medium to long term. Again, the timeframe should be questioned as this model for reporting, scoring and monitoring is in its infancy stage.

Figure 37: Average annual returns of shares over the 36 month period divided into ten social score deciles
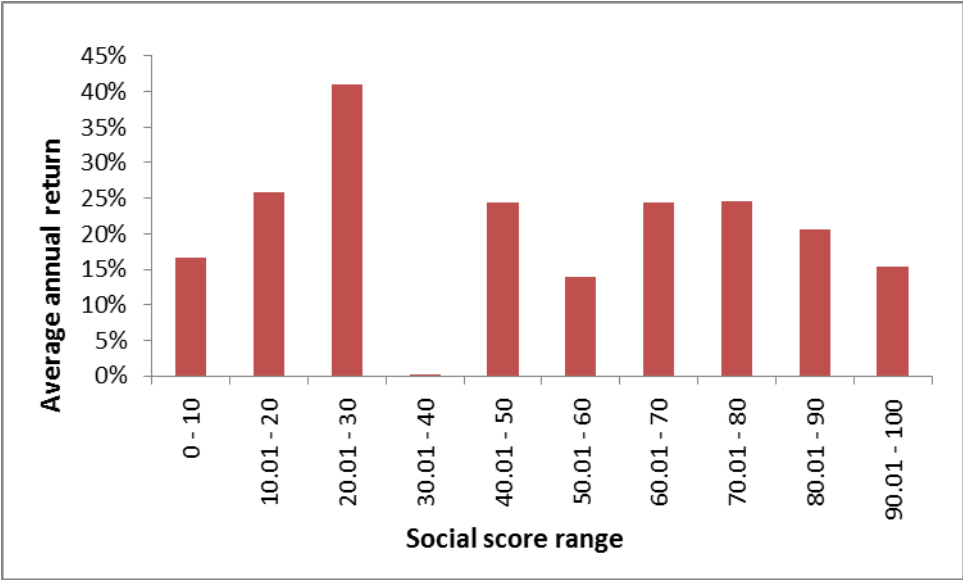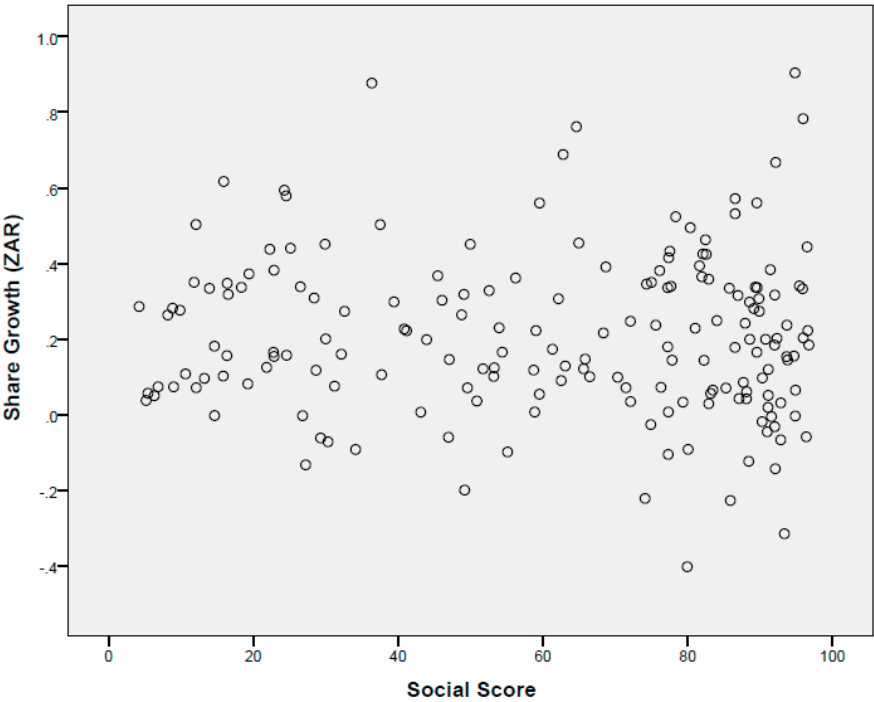

Figure 38: Scatter plot showing concentration of the social scores with no correlation to the share growth

2.3. Corporate governance score

The corporate governance rating is inwardly focused in an organisation, taking into account internal systems to monitor and protect long-term shareholder interests.

From Figure 39, it is evident that existing quality of internal controls has no impact on the value of the company's stock growth. This is strongly supported by the scatter plot in Figure 40 which shows a Pearson correlation of -0.078, implying that no relationship exists between the corporate governance score and the share growth. In fact, it is startling that 69% of the companies in the sample have ratings which are below 50% as researcher has shown that the monitoring of internal activities, namely the governance controls, has an impact on the ratings which an analyst assigns – this in turn is expected to have an effect on the share price and is reflected either in the increase or decrease in the share price (Harold et al., 2007).

The timeframe of the study and lack of data available over a long period may have had a negative impact on the regression analysis – as stated above these ratings are in its infancy and have therefore not been widely adopted.

Figure 39: Average annual returns of shares over the 36 month period divided into ten corporate governance score deciles
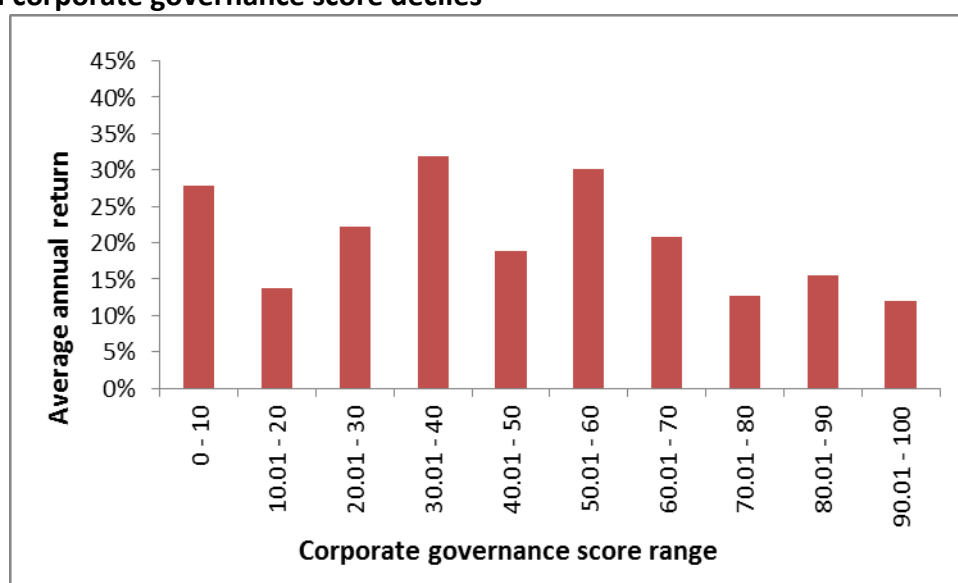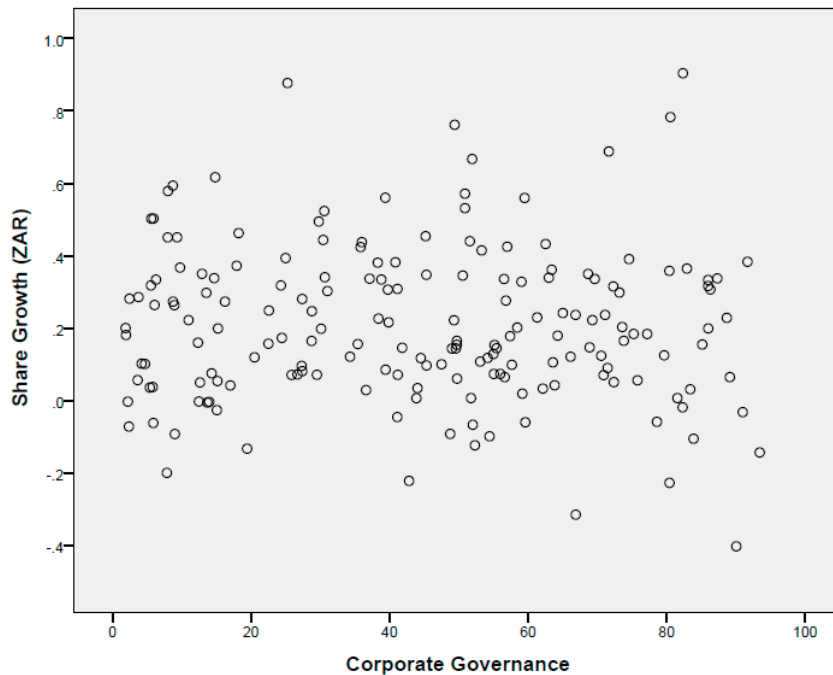
Figure 40: Scatter plot showing concentration of the corporate governance scores with no correlation to the share growth

3. Conclusion of results

From the multiple regression analysis, it was surprising to find that the results using a short timeframe of data were not similar to the findings from well know studies by previous researchers. For instance, the financial ratios selected for this study were time and again proven to identify undervalued stocks. The stark difference between the empirical studies undertaken and this study is the difference in markets where the theory is being tested, and more importantly the time frame being considered and incorporated into regression tests.

Many of empirical studies stated in the literature review were based on developed economies where information, both financial and non-financial, is easily accessible in comparison to emerging markets – Russia and China are prime examples of economies where companies continue to yield high returns despite the lack in information available for an investor to make a solid, comprehensive investment decision.

It can be argued that financial ratios and non-financial ratings selected for developing the model are incorrect and other measures should be explored for selection to develop a model.

CHAPTER 7:   CONCLUSION

Revisiting the research proposition, this paper set out to develop a model using selected financial ratios and non-financial ratings to identify stocks in which to invest by comparing the growth potential of a list of stocks to each other thereby aiding the investor in making an investment decision.

In an effort to develop the model, popular financial ratios, applied by value investors to identify undervalued stocks based on historical performance, were selected to be tested against the actual stock growth over a short period – 36 months – of companies listed on the stock exchanges in South Africa and India. In addition, a relatively new concept for reporting, scoring and monitoring non-financial performance which was found by researchers to impact company performance, namely the environmental, social and economic score or ratings, was selected as the non-financial variable to be tested for inclusion in the model.

The availability of data to meet the requirements of the selected ratios and scores or rating had proven to be a challenge across emerging markets, with South Africa and India being the two countries with questionably adequate information to prove the applicable theory through multiple regressions and correlation tests.

The final results of the study were disappointing to the say the least, as the final two variables which barely qualified to be included in the model were both financial measures – the dividend yield and the price-earnings ratio. By using these two variables, based on the regression analysis, an investor is only likely to be correct 8% of the time. This by no measure instils confidence in the applicability of the model where data available is less than a decade. It does however create opportunities for future research which is explored below.

Based on the findings, recommendations for future research are:

1. Apply the same variables selected to develop the model, against a longer timeframe to test the correlation between share growth and the different variables to test the assumption that the timeframe of data is the limiting factor in the study;

2. Use a combination of alternate financial and non-financial measures, preferably industry specific measures to determine the optimal combination of variables to determine future performance of a company, thereby forecasting future share growth;

3. Explore qualitatively, the applicability of the standardised ESG rating in the investment decision making process by investment analyst; and

4. Use an alternate measure for stock returns to determine whether a stock should be invested in, using the variables explored in this study.

Overall, it is clear that there is a need for more empirical studies to be undertaken in emerging and frontier markets if these economies are expected to grow and continue to attract global investors. It is also vitally important for the academic alumni to assist business by finding ways to apply theory more effectively when making business decisions.

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