

**Human Capital Return-on-Investment (HCROI) in South African
Companies listed on the Johannesburg Stock Exchange (JSE)**

by

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Master of Commerce (Human Resource Management) at the
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DECLARATION

I declare this work to be my own, that I have acknowledged all the sources I have consulted in the thesis itself and not only in the bibliography, that all wording unaccompanied by a reference is my own, and that no part of this thesis was directly sourced from the internet without providing the necessary recognition.

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Helene Viljoen

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Abstract

The management of human capital requires meaningful measures of human capital effectiveness that enable better strategic human resource decision-making. Existing measures, such as Human Capital Return on Investment (HCROI), allow human resource managers to quantify the bottom-line impact of human capital expenditure, but little is known about how HCROI varies within the population of listed companies. As a result, users of these metrics rarely know how they ‘measure up’ against their competitors in the absence of normative information. If human capital is considered a source of competitive advantage, measures of human capital effectiveness should also allow for normative comparisons.

The present study extracted audited financial data from *McGregor BFA* (2010) and described the central tendency and dispersion of HCROI of Johannesburg Stock Exchange (JSE) listed companies ($N = 319$). In doing so, it established a set of benchmarks for human capital effectiveness measures across industry and company size categories, as well as described temporal changes over the financial years surveyed (2006 - 2010).

Even though South Africa is considered to have a very low labour force productivity level compared to other countries (Schwab, 2010 in World Competitive Report, 2010/2011), the results showed that the grand median HCROI ratio for South African listed companies was higher ($M = 3.03$) than those from published figures from the USA, EU and UK (PwC Saratoga, 2011). This descriptive research also explored the influence of company size (small, medium or large) and company industry ($N = 42$) on human capital effectiveness (as indexed by HCROI). No statistically significant differences ($p > .05$) between the median HCROI ratios across company size categories were found, although notable differences in medians of HCROI across company industry categories were observed. HCROI also showed temporal fluctuations over the study period, reflecting economic cycle influences, but year-on-year changes were bigger when the mean HCROI was used — median HCROI remained relatively stable year-on-year.

From the research, several recommendations are made regarding the appropriate use of these HCROI benchmark data. Also, this descriptive study lays a solid foundation for future explanatory research aimed at investigating the antecedents, correlates and consequences of human capital return-on-investment (HCROI) as an indicator of human capital effectiveness. The present study contributes to human capital

metrics literature by demonstrating how human capital effectiveness indicators can be calculated from audited financial results available in the public domain, and in doing so, attempts to encourage greater use of human capital reporting in financial reporting standards.

Keywords:

Benchmarking

Descriptive study

Effectiveness

Human capital

Human Capital Return on Investment (HCROI)

Human Resource Management

Opsomming

Die bestuur van mensekapitaal vereis betekenisvolle metings van menskapitaaleffektiwiteit wat beter strategiese menslike hulpbron-besluitneming tot gevolg het. Bestaande metings, soos Menskapitaalbeleggingsopbrengs (*HCROI*), laat menslike hulpbronbestuurders toe om die finansiële impak van die menskapitaalluitgawe te kwantifiseer, maar min is bekend oor hoe menskapitaalbeleggingsopbrengste tussen die populasie van gelyste maatskappye varieer. Die gevolg is dat die gebruikers van hierdie metrieke aanduiders (*metrics*) selde weet hoe hulle ‘opmeet’ teen hul mededingers in die afwesigheid van normatiewe inligting. Indien menskapitaal as ‘n bron van ykmerk (*benchmark*) oorweeg kan word, moet die meting van menskapitaaleffektiwiteit ook normatiewe vergelykings toelaat.

Die huidige studie het geouditeerde finansiële data vanaf *McGregor BFA* (2010) onttrek en die sentrale neiging en verspreiding van menskapitaalbeleggingsopbrengs van die maatskappye wat op die Johannesburgse Effektebeurs gelys is ($N = 319$), beskryf. Sodoende het dit ‘n stel ykmerke vir menskapitaaleffektiwiteit-metings daargestel oor die industrie- en maatskappy-grootte kategorieë heen, sowel as om reële veranderinge oor die finansiële jare (2006 – 2010) wat ondersoek is, te beskryf.

Alhoewel Suid-Afrika met ‘n baie lae arbeidsmag produktiwiteitsvlak geag word in vergelyking met ander lande (Schwab, 2010 in *World Competitive Report*, 2010/2011), het die resultate getoon dat die algehele mediaan menskapitaalbeleggingsopbrengs ratio vir Suid-Afrikaans-gelyste maatskappye hoër ($M = 3.03$) was as die gepubliseerde syfers van die V.S.A., Europa en die Verenigde Koninkryk (PwC Saratoga, 2011). Hierdie beskrywende navorsing het ook die invloed van maatskappy-grootte (groot, medium of klein) en maatskappy-sektore ($N = 42$) op menskapitaaleffektiwiteit (soos geïndekseer deur die menskapitaal-beleggingsopbrengs) ondersoek. Geen statistiese beduidende verskille ($p > .05$) is tussen die menskapitaalbeleggingsopbrengs mediaan ratio’s oor die maatskappy-grootte kategorieë gevind nie, alhoewel daar noemenswaardige verskille in die mediaan van menskapitaalbeleggingsopbrengs oor die maatskappy-sektor kategorieë waargeneem is. Menskapitaalbeleggingsopbrengs het ook temporale skommeling oor die studieperiode getoon, wat ekonomiese siklus-invloede reflekteer het, maar jaar-op-jaar veranderinge was groter indien die gemiddelde (*mean*) menskapitaalbeleggingsopbrengs gebruik was – mediaan menskapitaalbeleggingsopbrengs het relatief stabiel van jaar-tot-jaar gebly.

Uit hierdie navorsing word verskeie aanbevelings gemaak rakende die toepaslike gebruik van die menskapitaalbeleggingsopbrengs ykmerk-data. Die beskrywende studie lê ook 'n vaste fondament vir toekomstige verklarende navorsing wat daarop gerig is om die voorafgaande veranderlikes (*antecedents*), korrelate en gevolge van menskapitaalbeleggingsopbrengs as 'n indikator van menskapitaaleffektiwiteit te ondersoek. Die huidige studie dra tot die menskapitaalmaatstawweliteratuur by deur te demonstreer hoe menskapitaaleffektiwiteit indikatore vanaf geouditeerde finansiële resultate kan bereken word wat op die openbare domein beskikbaar is. Daardeur word gepoog om groter gebruik van menskapitaalrapportering in finansiële verslagdoeningstandaarde aan te moedig.

Sleutelwoorde:

Ykmerk (*benchmark*)

Beskrywende studie

Effektiwiteit

Menskapitaal

Menskapitaalbeleggingsopbrengs (*HCROI*)

Menslike Hulpbronbestuur

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CHAPTER ONE

INTRODUCTION, OBJECTIVE AND OVERVIEW

1.1 Introduction

“People are our most important asset”

(Huselid & Barnes, 2003, p. 2))

Many managers agree with the simple statement above since they believe that the human resource component remains as one of the last remaining avenues to exploit as a means to enhance a company's competitiveness. Also, people enable other organisational functions to run and, therefore, should be an organisation's most important assets. However, the unfortunate situation is that the value of people (in other words, the asset of human capital to the company) unfortunately has been measured or experienced as a huge expense up till now (Fitz-enz, 2010). Moreover, human resource managers have been less than effective in demonstrating the contribution of human resources and human resource management to important outcomes, like profit. The consequence of the inability to quantify human capital effectiveness adequately is that an impression has been created that people do not add value.

South Africa (SA) is a developing country with a developing economy and with poor work force productivity (Bureau of African Affairs, 2010). According to the recently published Competitiveness Profiles, SA was ranked 81st out of 134 countries for “pay and productivity” during 2008. SA also has very active union representation and frequent strikes for higher salaries is the order of the day. Compared to the rest of the world, SA falls in the lower salary category for minimum wage rates if the 2010 percentage GDP per capita is considered (Bureau of African Affairs, 2010). The productivity level is also low (Schwab, 2010), being ranked at a staggering 97th place out of 134 countries.

The above should indicate that human capital effectiveness does matter. In their recent meta-analysis, Crook, Todd, Combs, Woehr and Ketchen (2011) demonstrated that human capital relates strongly to company performance. Using structural equation modelling, their study investigated whether human capital affected company performance, and whether the relationship between human capital (HC) and organizational performance was mediated by operational performance. Their results clearly showed that

“[h]uman capital is positively related to performance.” (p. 444). On average, human capital related significantly to performance ($\bar{r}_c = .21$). The interpretation of this result was that, if HC increases with one standard deviation, it will increase performance by .21 of a standard deviation. Further, a partial mediation model — one where operational performance acted as a mediator (see Figure 1.1) — fitted the data well. It could be argued that the human resource management function, through its allocation of human capital expenditure, as well as its employment of these resources through sound human resource management (HRM), plays a critical role in operational performance and, therefore, can be used to illustrate how human capital impacts company performance.

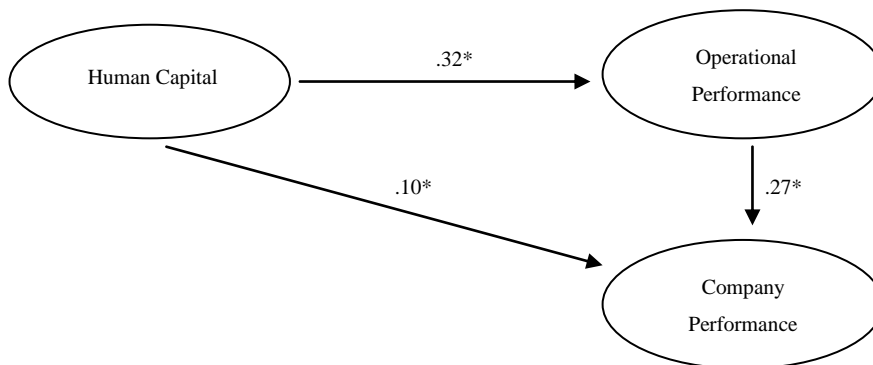


Figure 1.1. Mediation test results. Does human capital matter? A meta-analysis of the relationship between human capital and company performance by Crook, T.R., Todd, S.Y., Combs, J.G., Woehr, D.J. & Ketchen, D.J. Jr., 2011. *Journal of Applied Psychology*. 3, p. 451. Copyright 2012 by the American Psychological Association.

Studies like these (Crook, Todd, Combs, Woehr & Ketchen, 2011) directly address the impact of human resources on the “bottom line” and, therefore, serve to support the widely held notion that “people are our greatest asset”. However, these large-scale studies are not feasible for individual companies that need to determine whether people are indeed an asset to the company. For other organisational functions, companies frequently invest much time in setting rules and policies, quality control, services and products, and standards are set to reach the desired goals for the company. However, one aspect that is frequently forgotten or is regarded as inferior is the process of workforce evaluation. Evaluation can become a very reliable tool in measuring the effectiveness and productivity of human capital. The importance of measuring the effectiveness lies in the fact that an organisation can improve its productivity, quality and management. Furthermore, HR can determine where deficiencies are and focus

on that in order to formulate new strategies and approaches to amend these deficiencies. Measuring effectiveness also allows the organisation to anticipate challenges and opportunities that may affect growth and sustainability.

In a broader context, organisations exist with the main goal of economic prosperity. Society expects organisations to attain the highest possible output of need-satisfying products and to deliver service of outstanding excellence. This is required with the lowest possible input of production factors. In order to attain this goal, the organisation should gear itself towards maximum effectiveness to survive in the environment in which it exists. Consistent evaluation therefore is a must for every company to meet the demands of society. In support of this, Cummings and Marcus (1994) have agreed that the competitive world makes a paradigm shift that is to be expected for the human resource function as well. They believe that a competitive environment will require that human resource goals become clearly linked to business strategies (p. 9). The labour that people perform forms a fundamental production factor because an organisation is managed, operated and run by people. Labour also gives life to an organisation and other factors of production are mobilised through labour (Cummings & Marcus, 1994).

Schuler and MacMillan (1984) emphasised that an organisation must gain a strategic advantage over others, because this enables the organisation to control its own destiny. It could be argued that human resources could help to play a role in a company's abilities to acquire competitive advantage. According to Ulrich (1997) there is a definite relationship between human resources (HR) and financial performance. In his work, he identified a link between HR and a company's financial welfare and suggested that HR is moving "towards a sound empirical base". He added that there is a dramatic increase in the financial measures (higher business results) of the company when the quality of the HR practices is high. Quality HR practices give organisations an advantage over others that competitors will find difficult to remove — a fact which will keep the company in control for longer; consequently, the financial benefits of gaining a competitive advantage are substantial. To achieve this advantage, human resources managers need to establish a highly proactive full business partnership with line management if they want to be effective (Cummings & Marcus, 1994). HR has an obligation to prove, through the right financial indicators, that the interventions they perform add value to the organisation (Cronshaw & Alexander, 1985). A South African study by Pietersen and Engelbrecht (2005) indicated that senior HR managers and line managers are regarded as strategic partners in their organisations. This positive change is firstly driven by HR professionals internally to be a strategic partner in organisations, and secondly by an external pressure from stakeholders that forces HR managers to be strategic partners.

Clearly, HR has a definite role to play in the organisation and can no longer tarry in the background — HR must add value to the company. Fitz-enz (1980, p. 41) strongly supports the value-adding role of HR by saying the following:

Few human resource managers, even the most energetic, take the time to analyse the return on the corporation's personnel dollar. We feel we aren't valued in our own organizations, that we can't get the resources we need. We complain that management won't buy our proposals and wonder why our advice is so often ignored until the crisis stage. But the human resource manager seldom stands back to look at the total business and ask: Why am I at the bottom looking up? The answer is painfully apparent. We don't act like business managers, like entrepreneurs whose business happens to be people.

In other words, HR managers are not valued and taken seriously because they do not act “like business managers who happen to work with people” (p. 41). HR managers have, traditionally, struggled to use appropriate measurement techniques, based in sound financial management, to assess the contribution of HR to the ‘bottom line’ of their companies. The following anecdote highlights the problem. Fitz-enz (2010) shares the experience of many HR managers that, when management asks HR for evidence of adding value through its services, the conversation would more or less go like this:

“How is employee morale?”

“It's good!”

“How good?”

“Very good!”

(Fitz-enz, 2010, p. xii)

Fitz-enz aptly concludes his anecdote by asking whether any other function could be run with such poor quality performance indicators. His own answer to this question is that it “would definitely be ‘no’” (Fitz-enz, 2010, p. xii).

The concepts that underlie questions about the contribution of HR to the bottom line are effectiveness and efficiency. Fitz-enz (2010) believes organisations should manage their human capital in a way that attains

all the intellectual capital necessary to enhance effectiveness on the job and efficiency in producing or delivering goods. He states that effectiveness refers to the relationship between talent (the human capital in the company) and the organisation's performance. Effectiveness guides organisations to go beyond what others do and do something out of the ordinary – something more or extra to what others are doing. To achieve this, companies are prepared to pay well for talent to help them achieve the competitive advantage. This will enable a competitive advantage for one organisation against the other in the same company type. The right decisions should be made in terms of being better than the competitor company in strategy and in HR decision making or functioning.

To conclude: in the present competitive environment, a clear need exists for human capital to be effective for the organisation to reach its financial and survival goals. Effectiveness can be enhanced through a proper and effective decision-making system for proactive strategic matters, especially as highlighted in the study of Mostert and Engelbrecht (2005, p. 4) where they state that “[f]inancial investment decision making requires an assessment of labour-related risks”. Through hiring the right human capital, remunerating this human capital component adequately, and managing these human resources appropriately by means of suitable human resource management interventions, companies can ensure the probability of sustainable growth and competitiveness.

Although human capital effectiveness is important to individual companies, it is also critical within a broader context. To better understand the relevance of the proposed research study, the focus in the following discussion will shift to labour force productivity in South Africa (SA). This will enhance the need for this study to research the effectiveness of human capital in SA organisations.

1.1.1 Labour force productivity in South Africa

Labour force surveys are statistical surveys conducted in a country and designed to capture data about the labour market. Browne and Alstrup (2006, p. 3) describe such a survey as follows:

In a nutshell, the Labour Force Survey (LFS) is a very large household survey designed to give information about the number of people with jobs, the details of these jobs, the job-search activities of those without work, and so on. The results are used by government (central and local), researchers and academics, and international organisations.

In other words, this survey contains all the information regarding a country's labour force.

South Africa is a developing country with an emerging economy. According to the World Competitive Report 2010/2011 the productivity level of SA is relatively low () with the country allocated a very low 97th place out of the 134 countries recorded (Schwab, 2010). In spite of this, SA has recently been included into the BRIC countries. The BRIC countries are those viewed as the most promising countries amongst the developing countries. The original BRIC countries included Brazil, Russia, India and China because of their large emerging markets. The acronym BRIC was coined by Jim O’Neil in 2001 presented in a paper entitled “*Building Better Global Economic BRICs*” (Kowitz, 2009). It has, in the meantime, come into widespread use as a symbol of the shift in global economic power towards the developing world in steering away from the G7 developed economies (United States of America (USA), Japan, Germany, France, United Kingdom, Italy and Canada). The “S” was formally added on April 13, 2011 to form BRICS after the admission of South Africa into this union (Radcliffe, 2011; Meyer & Pronina, 2011). BRICS is also referred to as the “Big Five or Five States” (Radcliffe, 2011).

The national growth in GDP¹ (PPP²) and GDP (nominal³) for the BRIC countries during 2010 can be viewed in the following table (the ranking follows every value):

Table 1.1

GDP (PPP) and GDP (nominal) ranking for the BRIC countries during 2010

	GDP (PPP)	GDP (nominal)	Area (km²)	Population
China	\$10 084 billion ^①	\$5 745 billion ^①	9 640 821 km ² ^②	1 341 000 000 ^①
India	\$4 001 billion ^②	\$1 537 billion ^③	3 287 240 km ² ^④	1 210 193 422 ^②
Russia	\$2 219 billion ^③	\$1 477 billion ^④	17 075 400 km ² ^①	142 905 200 ^④
Brazil	\$2 182 billion ^④	\$2 024 billion ^②	8 514 877 km ² ^③	190 732 694 ^③
South Africa	\$525 billion ^⑤	\$357 billion ^⑤	1 221 037 km ² ^⑤	49 991 300 ^⑤
Total	\$19 011 billion	\$12 033 billion	39 739 375 km²	2 934 822 616

(Goldman Sachs, 2011)

¹ Gross Domestic Product: “is one of the primary indicators used to gauge the health of a country’s economy” (www.investopedia.com/ask/answers/199.asp)

² Purchasing Power Parity: “an economic technique used when attempting to determine the relative values of two currencies” (www.wisegeek.com/what-is-purchasing-power-parity.htm)

³ GDP (Nominal): “a GDP figure that has not been adjusted for inflation” (www.investopedia.com/terms/n/nominalgdp.asp)

In the above table it is evident that South Africa ranks lowest in the GDP (PPP) and (nominal) values. It should be taken into consideration, however, that South Africa has by far the smallest population and land area in comparison with the other four countries. South Africa only has 1.7% of the total population, compared to China's 45% and Russia with the 4th lowest population at 4.8%. This is a substantial difference. If one takes the population difference into consideration, South Africa is doing well and one therefore can understand why it has been included into BRICS. South Africa's GDP (PPP) only comprises 2.7% of the total, compared with Brazil which is in the 4th place with 11.4 %, which is a huge gap. This shows why South Africa is seen as an emerging economy – one with great potential.

In spite of the inclusion of SA as part of BRICS, it still receives bad rankings according to the Global Competitiveness Index (GCI) 2009-2010 Report, which ranked South Africa 45th overall out of the 133 countries, and regarding labour market efficiency South Africa is ranked 90th (Schwab, 2009, pp. 13, 19). During the 2010-2011 year, the South Africa position unfortunately deteriorated from the 45th place to the 54th place with regard to the GCI. Regarding labour market efficiency, South Africa also dropped to 97th place for the 2010-2011 year. This information paints a bleak picture for South Africa. Furthermore, concerning productivity levels per person employed, Sub-Saharan Africa (where South Africa resorts), worker productivity is one-twelfth of that of a worker in the industrialised countries like the USA, where the labour productivity level is US\$35.63 (ILO Press Release, 2007, p. 1). During the 2008/2009 financial year, USA companies on average spent twenty-eight cents (US\$0.28c) on workforce compensation and benefit costs to generate one dollar of revenue. This amount therefore served as a benchmark for SA companies since no other benchmark was available.

Fitz-enz (2000) accentuates that the key to upholding a profitable company or a healthy economy is in the productivity of the work force, which is seen as its 'human capital'. He highlights the fact that knowledgeable people provide the driving force in the American economy. The stock market in America has recognised the leverage of human knowledge and has therefore awarded a market value that far exceeds their book value to companies in the service and technology fields. Leverage can be explained as the use of certain fixed assets to enhance the return on investments or sales, like common stock leverage and borrowed capital. Companies receive their funds through stock offerings or borrowing and their objective is to use these funds to generate greater returns than the cost incurred. Fitz-enz (2000), therefore, is of the opinion that most managers and financial analysts in America have at last acknowledged that human capital has great leverage potential.

After acknowledging the importance of productivity for the organisation, the discussion can be shifted to human capital, how it is defined and its importance for this study.

1.1.2 Human Capital

The management of people, the human capital in an organisation, remains a major challenge for practitioners. Human capital is viewed as a tangible asset. Huselid and Barnes (2003) are quoted as acknowledging that people are the company's most important asset. Therefore organisations need human capital to reach its goal, i.e. to produce, grow and to gain financial prosperity – to outperform the competitors. The criterion for the success of a company is that investors recognise an opportunity to invest in a company to gain financial benefit from it. If a company gains a competitive advantage above others, it becomes more attractive as an investment destination for investors, because investors seek to achieve the highest return from the investments they make. This would also be a reason why companies would be off-shoring to China (TradeInvest South Africa, 2011) because production costs are much cheaper in China. All companies do not do this kind of investment, however, but a few individual companies, like South African Breweries (Reuters, 2011), in South Africa lead the way. It is for this reason that South Africa as a country needs to collectively improve its human capital in order to be more competitive.

It is interesting that Kwon (2009) differentiates between two types of the Human Capital (p. 5):

- The first is to utilize “human as labor force” related to economic added-value that is generated by the input of labor force as other production factors such as financial capital, land, machinery, and labor hours.
- The other is that the human capital can be viewed as the target of investment through education and training
→The human capital expansively includes the meaning of “human as creator” who frames knowledge, skills, competency, and experience originated by continuously connecting between “self” and “environment”.

Smith (in Plowman & Perryer, 2010) notes that human capital is one of the means of production. Adam Smith, a Scottish economist and philosopher in the late 1700s wrote, in his second “Wealth of the Nation” book, in Chapter III, about the accumulation of capital – about productive and unproductive labour. Smith (in Plowman & Perryer, 2010, p. 3) states that productive labour leads to an increase in goods and unproductive labour does not add to wealth because the value of it is consumed as soon as it is created:

One sort of labour adds to the value of the subject upon which it is bestowed: there is another which has no such effort. The former, as it produces a value, may be called productive; the latter, unproductive labour. Thus the labour of a manufacturer adds, generally, to the value of the materials which he works upon, that of his own maintenance, and of his master's profit. The labour of a menial servant, on the contrary, adds to the value of nothing ... A man grows rich by employing a multitude of manufacturers; he grows poor by maintaining a multitude of menial servants. The labour of the latter, however, has its value, and deserves its rewards as well.

Smith is saying that, if labour adds value, it is productive. This is precisely what human capital should do for a company – to add value through its labour. Smith (2005, p. 31) further defines the value of commodities by the labour embedded, as well as by the labour goods command:

The real price of every thing what every thing really costs to the man who wants to acquire it, is the toil and trouble of acquiring it. What every thing is really worth to the man who has acquired it, and who wants to dispose of it, or exchange it for something else, is the toil and trouble which it can save to himself, and which it can impose upon other people. That this is really the foundation of the exchangeable value of all things, excepting those which cannot be increased by human industry, is a doctrine of the utmost importance in political economy.

Therefore, Smith said that the real price of something is worth the trouble one puts into acquiring it. Furthermore, the value of something (acquired) that one wants to get rid of in exchange for something else, again, is the trouble it saves the person and what this item imposes on others. This is the foundation of exchangeable value. This links to the need for companies to make use of human capital in exchange for something else – the need for financial gain.

Smith (2005) provided a second definition of the value of reproducible commodities and services, which pleased neoclassical economists. They (neoclassical economists) believe that one determines value by the utility that a commodity provides for a person, while the classical economists believed that one determines value by the cost of production. Smith's second definition of value states that "the value of any commodity...is equal to the quantity of labour which it enables him to purchase or command. Labour, therefore, is the real measure of the exchangeable value of all commodities." (p. 31). This is in contrast to what Ricardo (1817, cited in Smith, 1976) believed, which was that the value of reproducible commodities and services was a reflection of the relative difficulties of production counted in labour units

(direct labour + dated labour of the past embedded in inputs and corrected by interests). Ricardo also disagreed with Smith's second definition of value (above).

It is important to note that human capital can be defined in terms of the focal level. Human capital is typically studied at either the individual level (Bontis, 1998, cited in Bontis & Fitz-enz, 2002), the enterprise level (Cascio, 2010), as well as the national level (Mincer, 1981). For the purpose of this research, only the enterprise level will be discussed in detail.

As stated above, human capital also exists on national level which was viewed by Mincer (1981) "as a factor of production coordinate with physical capital. This implies that its contribution to growth is greater the larger the volume of physical capital and vice versa." (p. 1). Deloitte Global Services Ltd. (2011) believes that issues related to human capital are occupying the minds of business executives more than ever before. The people-related challenges that businesses face today, to mention a few, include the enormous pressure to boost profitability and performance which results in improvement and changes that threaten to overwhelm the workforce; and also the limited talent in organisations that has to sustain strategy, which directly influences the competitive edge and profitability of an organisation.

It seems that HR professionals find it difficult to define human capital and the appropriate methodologies to measure it. Some of the definitions currently in circulation are presented below to support this statement. Bontis (1998, cited in Bontis & Fitz-enz, 2002) defines human capital on an individual level as coming from a combination of four factors, namely: (1) the genetic inheritance; (2) the education; (3) the experience, and (4) the attitude to life and business. This links to what Weatherly (2003, p. 5, cited in Chrysler-Fox, 2010, p. 18) says, namely that human capital is an asset, being "... the collective sum of the attributes, life experiences, knowledge, inventiveness, energy and enthusiasm that ... people choose to invest in their work". Marr and Adams (2004, in Van der Westhuizen, 2005; Ployhart & Moliterno, 2011) expanded on the above, explaining that human capital is the collective of knowledge, skills and competencies of employees, leadership and communication practices. Another researcher believes that the term human capital refers to knowledge, skills and abilities (KSAs) that are embodied in people (Coff, 2002, in Crook *et al.*, 2011). All these authors at least agree that human capital is a collection of attributes put together.

Roodt (2006) believes human capital forms part of an increasingly competitive market – with its intangible assets or intellectual capital – but it is often difficult to assess the company's performance in this area. Singh and Latib (2005) also remarked on the lack of focus on the increasingly competitive

market. They want to know why many CEOs and HR executives pay so little attention to human capital, if it is indeed true that its value is enormous and that the possibility exists that it can run into billions of dollars. This again highlights the importance of human capital measurement, because, if it is not measured, how can one know that it adds value?

Bontis and Fitz-enz (2002, p.2) highlight the importance of human capital as a source of innovation and strategic renewal in saying:

...it is a source of innovation and strategic renewal, whether it is from brainstorming in a research lab, day-dreaming at the office, throwing out old files, re-engineering new processes, improving personal skills or developing new leads in a sales rep's little black book.

Fitz-enz (2000) also added to the importance of human capital saying that many senior managers have come to realise the importance of human capital when they realised during the last millennium that "people, not cash, buildings or equipment, are the critical differentiators of a business enterprise" (p.1).

It is important to realise that every company has a pool of human capital. Bontis and Fitz-enz (2002, p. 2) state that "human capital is the profit lever of the knowledge economy". This means that a company through its human capital possesses a lot of knowledge which can be used to the company's advantage. One could say that each employee in an organisation possesses tacit knowledge (those unspoken skills which are necessary to perform a function).

Chrysler-Fox (2010, p. 224) recommended, because of the conceptual confusion between the definitions of human resource management and human capital management that the definition for human capital management rather be amended to:

...an approach to people management that treats **it's outputs** as [i] a high level strategic issue and seeks systematically to [ii] analyse, measure and evaluate how people policies and practices create value **through the application of statistical inference in providing context and decision-level-specific information to the appropriate level of complexity and thus to influence the business strategy.**

From the above discussion, it can be concluded that human capital is term with varying meanings and that each meaning would suggest a unique way to quantify the contribution of human capital to a company's business objectives. The topic of human capital and its measurement will be discussed further and in more

depth in the literature study. For most companies, however, measuring human capital at the enterprise level seems to be the most relevant.

1.1.3 Measuring human capital at enterprise level

It has already been mentioned that people are an organisation's most valuable asset and HR has the role of managing and developing this asset. How is it possible then to measure HR's effectiveness in this role? Another question concerns how one can determine whether HR is indeed adding to the bottom line of the organisation. The obstacle in measuring HR effectiveness may seem to involve the fact that the human capital asset that managers have to manage is an intangible asset. The value therefore resides in the intangible assets of the organisation. Measuring the value of this intangible asset (human capital), however, is definitely possible and feasible. In order to achieve this, it is necessary to implement HR Best Practices such as performance appraisal, reward and recognition, selection, etc. Best practices impact positively on the bottom line of the organisation. However, best practices alone cannot improve an organisation's performance through people. An HR strategic mind-set must be adopted and this involves the alignment of the HR function with core value propositions (a strategic focus) of the company (Sowden & Sowden, 1992).

Cascio (2010) regards HR measurement at the enterprise level as valuable only to the extent that it improves vital decisions about talent and how it is organised. Decision-science also contributes to the effectiveness of the organisation in the way these decisions are executed.

One perspective on HR measurement holds that HR can be measured in two main ways, namely in 'do-ables' and 'deliverables' (Sowden & Sowden, 1992). To measure these terms involves the following:

Do-ables: measurement of HR competencies (e.g. administrative efficiency; strategy execution), HR practices, HR systems, and

Deliverables, which comprise the most important aspect of the two, because HR must deliver an appropriate workforce – the ultimate aim of any HR system is a successful workforce. Workforce success occurs when the workforce has a positive impact on the key drivers of the organisational performance. In a strategic planning process the HR deliverables are the *workforce's mind-set, competencies and behaviour*. Deliverables can be measured through surveys and information derived from performance appraisals in relation to the strategic focus of the organisation.

Another perspective in HR measurement involves a consideration of the type of questions that initiate the measurement process. In this regard, three levels of questioning become of utmost importance, i.e. the why, what and how of HR measurement. Chrysler-Fox (2010) refers to some HR researchers (e.g., Becker, Huselid & Ulrich, 2001; Burkholder, Golas & Shapiro, 2007; Fitz-enz, 2005; Huselid, Becker & Beatty, 2005; Young, 2005) who focus on the question of “**Why** are we measuring?” In other words, which underlying needs and motives drive the need for measurement? Another question, “**What** are we measuring?”, is typically asked (e.g., Burkholder *et al.*, 2007; Young, 2005). Using this question, typically, a problem exists that needs to be resolved by making use of appropriate information. The last question is “**How** are we measuring?” referring to the technique of measurement metric that is utilised (e.g., Burkholder *et al.*, 2007; Young, 2005). In summary, a thorough consideration of these questions should precede any effort at measuring the contribution of human capital to important company outcomes.

The Human Resources department is increasingly pressured to measure its costs and accomplishments because of the fierce competition for companies to show sustainable financial success. Pfeffer (1997b, p. 358) lists the following aspects of particular concern to HR managers:

- 1) Organisations are facing increasing competitive pressure because of rapidly changing technology and the increase of open markets, which is illustrated by the fact that American Airlines operate a data processing centre in the Caribbean.
- 2) The pressure to grow earnings per share to satisfy the capital markets forces organisations to focus on efficiency.
- 3) Besides the “general competitive and financial market pressure, there is also a prominent trend toward benchmarking that has affected the human resource function as well.” This is evident in the number of HR professionals per 100 employees in the company.
- 4) The fallacy (misleading notion) of the median presents a problem. Questions arising from this have to do with whether it will be enough if management informs employees that they are rated above the median for comparable companies. The aim of everyone will be to be better than the median and the dynamics “unleashed” by this will probably involve a constant effort to reduce costs and to look better than the next company.
- 5) Another HR pressure involves the *new employment contract* which means that all employees are seen as a contingent (a body or a group). This affects the concept of outsourcing or “where succession and development are anachronistic concepts in a market-based labour force system in which outside recruiting comes to serve as *succession planning*.”

- 6) HR professionals want to be grouped with accountants, marketers and engineers. If they do not want to take part in measuring, they cannot be taken seriously by the top councils of the organisation. The HR division should be asked when last it measured its contribution to the bottom line of the company.
- 7) Pfeffer (1997b) is of the opinion that for HR to take part in measurement can be *healthy* and should be *expected*.

As mentioned before, many still view human capital measurement as unnecessary. Possible explanations why so little attention is given to human capital measurement are:

- The influence of HRM on a company's performance is difficult to measure (Becker, Huselid & Ulrich, 2001).
- Currently there is no a reliable way to measure the contribution that human capital makes to corporate profit (Fitz-enz, 2000).
- According to Ulrich (2006), CEOs and HR executives do not know how to measure the contribution made by human capital.
- People are said to be the greatest asset in a company, but if the value of 'human asset' is not measured, this cannot be proved (Kearns, Walters, Mayo, Matthewman & Syrett, 2007).

In the above discussion the diverse views of those for and those against human capital measurement has been highlighted. This may explain why the concept of human capital measurement is sometimes avoided. In Chapter 2 the various approaches to human capital measurement, e.g. the different scorecards, human capital metrics and HCROI, will be discussed in detail. The following discussion, however, will focus on the role of strategic human resource management in human capital measurement.

1.1.4 The role of human capital measurement in Strategic Human Resource Management (SHRM)

The role of HR has changed from only performing an administrative duty, to one of being a *business partner*. To be part of the business process, HR should also understand the day-to-day operations of the whole company. The bottom line is that HR may no longer shy away, but will have to be part of contributing to the growth of the company. Fitz-enz (2009) says that there should somehow be a 'price' on human capital to give an indication whether they are an asset or only an expense to the company. Brewster, Carey, Grobler, Holland and Wörnich (2008) agree that HR should be regarded as a strategic lever that has economically significant effects on the bottom line of a company and is slowly shifting to focus more on value creation.

Measurement is necessary for all stakeholders. If HR is to fulfil the role of business partner, measurement will play an important part in demonstrating *accountability*. Accountability confirms that “concepts need to be replaced with evidence, ideas with results, and perception with assessments” (Ulrich, 1997, p. 303). In this regard, Phillips (1996) has pointed out that, in general, there has also been an increase towards financial accountability in management.

Some HR leaders have already taken on the opportunity to become full partners in the development and implementation of *strategy*. However, neither HR executives nor other managers are satisfied with HR’s capabilities. Lawler, Boudreau and Mohrman (2006) say the notion is that, if the science of decision making is enhanced, the strategic involvement of HR be also enhanced. The strategic involvement of HR could be enhanced if the science of deciding on human capital of both HR executives and business leaders improves.

Drucker (cited in Fitz-Enz, 2010) says the best way to *predict the future* is to create it. The reason why something such as human capital metrics should be present is to inform management where the company is, and what they should change in order to survive the future. Although human capital metrics is a reality, not everyone knows precisely how to apply it in terms of its influence, the formulation of it and its implementation of the business strategy. Many also struggle to gain a proper understanding of it. This may result in the problem that human capital is not measured properly and that it does not contribute to the bottom line and market value of the organisation.

Another role of human capital is through *decision making*. Boudreau and Ramstad (2002, p. 4) have stated that “[o]rganizations must increasingly demonstrate, with data, that their human resource strategies significantly enhance competitive advantage, not simply that they are efficient or ‘best-in-class’”. Decision making is an important aspect in an organisation and contributes to the execution of HR strategies and giving evidence of human capital expenditure strategies. Boudreau and Ramstad (2002, p. 5) introduced a new concept in the place of decision making, namely “talentship”. They explain it as follows:

There are at least three markets that companies must compete within in order to be successful: capital market, the customer/product market and the talent market. Each of these markets has a wealth of measures associated with them. However, in each of the other markets, there is a clear distinction between the professional practices associated

with the market and the decision science that supports it. Within the capital markets, the practices of accounting are supported by the decision science tools of finance. Likewise, the professional practice of sales is augmented and supported with the decision science of marketing. As we have noted (Boudreau & Ramstad, in press; 2002), HR has a rich set of professional practices, but lacks a decision science. We have proposed that now is the right time for such a science to emerge, and we have called that science, “Talentship”.

What does a decision science do and why is it important? Boudreau and Ramstad (2002, pp. 5-6) accentuate that:

It provides a logical, reliable and consistent – but flexible – framework that enhances decisions about a key resource, wherever those decisions are made. A decision science does not rigidly prescribe actions, but rather provides a system to guide, identify, analyze and enhance key decisions. A decision science has particular implications for information systems and measurement techniques.

Furthermore, the importance of decision making is to select the best possible HR information systems possible and implement it. Highly confidential matters are stored and processed on this system. Furthermore, this information contributes to making a more informed decision about future matters. In the latest technological development, Human Resource professionals have a whole new way of doing their job. This makes HR the latest partner in Web development, simply known as E-HR (Brewster *et al.*, 2008). Karakanian (in Brewster *et al.*, 2008, p. 246) describes E-HR as:

... the overall HR strategy that lifts HR, shifts it from the HR department and isolated HR activities, and redistributes it to the organisation and its trusted business partners old and new. E-HR ties and integrates HR activities to other corporate processes such as finance, supply chain and customer service. Its promise is that HR is the owner of the strategy and when required it is the service broker as opposed to the provider.

In the above quote Karakanian is saying that HR should really start to do its homework and the executive team should participate in this process. HR should also have appreciation for the use of technology and use the network of technology wisely. Linked to this is a well-developed human resource information system (HRIS).

Measurement in strategic human resource management also determines *human capital effectiveness*. In ordinary day-to-day living, measuring takes place continually; students, for example, are graded

according to their knowledge, and employers grade employees or test intelligence and personality. People are continually measuring or being measured by others. Measurement influences our daily lives, and the science and practice of work and organisational psychology (W&O) rely on good measurement for guidance in employee selection, classification and placement. Without sound measurement as a base, our field cannot advance or provide a service of value to the business community and justified decisions cannot be made without valid or reliable measures of employee characteristics (Aguinis, Henle & Ostroff, 2001).

Birkman International (2008) is of the opinion that HR professionals must move into a “transformative HR” where recognisable stages emerge. The first stage is that HR should understand the business realities that the business faces. The other stages are (p. 14):

Stage 1: HR understands the business realities the organization faces

Stage 2: HR professionals take a customer-focused approach to meaningful metrics (including the organization’s customers, investors and stakeholders - not just employees)

Stage 3: HR constructs policies and procedures that align HR objectives to business goals

Stages 4 and 5: HR focuses on its abilities to meet the needs of the organization through adequate resources and appropriate competencies.

In conclusion, it is clear from the above that the role of human capital measurement in strategic human resource management has changed. It is important for human capital to contribute to new strategies to help the organisation survive the future. HR professionals have the ability to demonstrate the human capital contribution to the company through measurement and they can, through these assessments, also determine which expense yields the highest return for the company. Measurement will also be an indicator for investors to invest in a company that shows solid and steady growth for anticipated financial benefits to them. The need for, impact and benefits of measurement of HRM are discussed at a later stage.

From the above, knowing that measurement in human capital is important in order to determine how well the organisation performs, and that the role of HR is to be effective, there is a definite need for benchmarking in South Africa and this is one of the main reasons why the current research needs to be undertaken. The following discussion concerns the need for benchmarks in HC measurement.

1.1.5 The need for benchmarks in human capital measurement

Many line management officials favour and sometimes demand benchmarking since it is a tool for comparison with the competitor, for better understanding of an organisation's resources and for valuing chain activities. Pearce and Robinson (2005) regard it as a discipline and is applied as a tool to analyse the internal and external environment of an organisation. On the other hand, though, Chrysler-Fox (2010) states that literature available for human capital metrics does not always favour benchmarking. Singh and Latib (2005, in Chrysler-Fox, 2010, p. 26) are of the opinion that, although "[b]enchmarking can be useful, but in our experience it is widely misapplied in HR", especially when it is used to measure HR's performance. Huselid and Becker (2003) affirm that it is wrong to rely on external benchmarks to measure HR performance. They believe that it cannot measure the contribution of HR (performance) to the success of an organisation.

Although the above researchers regard benchmarking negatively, Fitz-enz (1992, p. 1) believes otherwise and uses the following *definition* to describe benchmarking: benchmarking is "a point of reference for making measurements; something that serves as a standard". According to Fitz-enz, it was in Japan that this tool was used successfully to close the quality and productivity gap in the 1960s and '70s. Japanese managers went to North America after World War II to study its production methods, went back home and tried to improve the products they thought worthwhile improving on. Today Canada and the USA are trying to turn the tables again by using this same tool to close the gap with their competitors – whether domestic or foreign. One can say that benchmarking is an organised method for collecting data to improve internal administration, product manufacture, sales efficiency or service delivery. Before benchmarks were used, managers described the changes of customer requirements based on history or 'gut feel' and not on market realities or objective evaluations. Benchmarking must not be confused with data gathering, though. Fitz-enz (1992) stresses that the aim of benchmarking is to locate organisations that do something outstanding (a work process), and to develop a data-sharing relationship with them in order that both parties may learn. Benchmarking is aimed at closing the gap between one organisation and the rest in the same field.

Holloway, Francis, Hinton and Mayle (1998, cited in Chrysler-Fox, 2011, p. 25), on the other hand, define benchmarking as a practice "... through which organizations continually review the outputs from their operations and identify ways to make changes in their processes so that better outputs result". Francis, Humphreys and Fry (2002, in Magd, 2008) believe that benchmarking becomes increasingly important as a management tool to empower managers to monitor and improve aspects of their

operational performance by referring to other organisations and to learn from them. Swist's (2001, p. 37) rich definition of benchmarking describes it beautifully by saying that it is the "... process of identifying, discovering, learning, understanding, and evaluating key performance measures, and of adapting practices, metrics, and processes across companies and industries." To complete this, Magd (2008) accentuates that benchmark definitions include elements of continuous improvement, measurements against another, and rigour.

From the above it is apparent that many believe in the importance of benchmarking. Some of the *benefits* of benchmarking are therefore highlighted (Fitz-enz, 1992, p. 2):

- staff relationships improve – those in a team that work together for a while usually develop a spirit of teamwork that is carried over to everyday interactions.
- the data gathered in a successful benchmarking project and the results of implementing such data are usually very visible. The end product should be that they should be able to make substantial process improvements with the gathered information.
- another benefit concerns the relationships that are built with external benchmark partners.

Stiles and Kulvisaechana (2003) however, emphasised that benchmarking has some negative aspects, for instance that it does not tie metrics to business goals. The implication of this is that every organisation would use the same strategy if external benchmarks were used to measure performance (Becker *et al.*, 2001) and that there is not much referential integrity regarding desired outcomes (Singh & Latib, 2005). The latter is more in favour of internal benchmarks.

Fitz-enz (1992, p. 1) furthermore distinguishes two main approaches when it comes to benchmarking. He lists them as follows:

- a basis in *cost* – this one is the more common of the two and is driven by the competitiveness of the marketplace (e.g. raw material costs, direct and indirect labour pay and benefits expense, cost of sales, etc.). It is used to learn how your own organisation compares with others and where to gain competitive advantage.
- a basis in *operations* – this approach is usually undertaken when a company finds itself at the crossroads in the marketplace. It can be undertaken on a small or a large scale and concentrate on key factors analysis.

Once benchmarks have been determined through an industry survey of human capital effectiveness, one can suggest to companies to also include this measure as an indication in their financial reporting to

shareholders, i.e., their corporate annual reports. In South Africa, corporate governance has been put on the agenda by guidelines such as the King series (South African Institute of Chartered Accountants, 2010) of reports on Corporate Governance. From a corporate governance point of view, then, human capital reporting can be greatly facilitated by the existence of industry benchmarks for human capital effectiveness. The expectation is that companies would gladly add human capital effectiveness results, in comparison to industry benchmarks, to their annual report.

From a practical perspective, a local industry benchmark for human capital effectiveness measures, such as HCROI, would also be useful as a management tool for individual companies, since it would be possible for companies to assess their ability to generate profit from human capital expenditure against their comparable peers, depending on industry, company size, and other characteristics. As this information is, at present, not available in the public domain, it is not possible for organisations to know whether they are comparatively competitive from a human capital employment point of view.

A need also exists for an industry survey at a theoretical level. The ultimate goal of any measurement would be to utilise the resultant information to improve decision-making (Blumberg, Cooper, & Schindler, 2008). Companies can greatly benefit from an understanding not of the industry average for HCROI, but rather, from *what leads to* high levels of HCROI. Therefore, developing and testing an explanatory model of human capital effectiveness should be the ultimate aim of human capital effectiveness research. It is envisaged that the proposed descriptive study would be a precursor for later explanatory research that attempts to understand *why* certain companies are better able to generate profit from human capital expenditure. Without descriptive research, though, such explanatory research would probably not develop later. In this way, the proposed descriptive research, by describing the central tendency and dispersion of human capital effectiveness in the South African context, would take a very important first step towards a greater understanding of more effective human capital employment.

Companies cannot exist without their human capital. Human capital is represented by the employees working in a company to help management (CEO/manager/owner) make more money. For this to happen, the work of the employees should help the company become even more successful, they should be more productive than others in the same market, should add value to the company, and should be better in its production line or services rendered than others. Therefore a strong productive labour force and a strong intellectual capital basis with talented employees are needed in order to contribute to that competitive edge. The concern remains that the work force in SA is not as productive as in developed countries and strong union representation increases the concern that production decreases in relation to

salaries paid. It is therefore important to measure the HCROI for SA to determine the benchmark locally and internationally. This study endeavours to contribute to that goal. The basic research-initiating question in this descriptive research study is as follows:

How do *JSE listed companies in SA* perform with regard to *human capital effectiveness, as measured by human capital return-on-investment (HCROI)*?

The expectation is also that SA companies will rate lower on HCROI because of low productivity levels. It is expected that, once SA companies learn of their HCROI, they may aspire to employ new methods to improve productivity and to change their HCROI. A question that is collateral with the basic research-initiating question is:

Why does the performance of *JSE listed companies in SA* vary with regard to *HCROI*?

Achieving a positive HCROI is not a random event but the result of the lawful working of a complex network of interacting variables. Successful handling of the anticipated problem of SA companies having a lower HCROI than companies in developed countries would require a thorough diagnostic evaluation by means of a proper measuring system of all the influential prerequisites for HCROI as well as determining the role of human capital in the strategic planning of the company.

This concludes the introduction to this study. To capture the foregoing, labour force productivity in South Africa has been discussed, followed by definitions of what is meant by human capital, and its importance. Measuring human capital at enterprise level then followed, leading to the role of human capital measurement in SHRM. Lastly, the need for benchmarks in human capital measurement was discussed. Consequently the objective of this study is discussed in the following section.

1.2 Objective of the study

It is contended that a comprehensive human capital effectiveness (HCROI) survey would go a long way to assist company owners, shareholders, managers and HR specialists to manage human capital better towards the ultimate aim of increased profitability.

To diagnose the roots of human capital effectiveness would require that one should explain the full range of determinants that affect the HCROI via a comprehensive diagnostic model. HCROI is not a random event, but an expression of the working (lawfully) of a complex network of variables that interact. To successfully treat the problem that HCROI metrics do not exist in SA would require that HCROI should

be calculated for SA companies listed on the Johannesburg Stock Exchange (JSE), in order to attain and set a benchmark. The goal of the study is thus to compile a set of HCROI benchmarks for use by companies to compare their own human capital effectiveness measures against.

The objectives that this study present, are:

- It will provide benchmarks in SA for companies to measure themselves against norm group companies,
- It will describe SA companies, across various sectors and companies sizes, in terms of Human Capital Effectiveness,
- To compare SA as a developing country with developed countries in terms of Human Resource (HR) Effectiveness,
- It may develop a 'research agenda' concerning 'causes and consequences' related to HCROI.

The above consequently contributes to the following values for South African companies :

- To help empower HR managers and CEOs in SA companies to quantify the contribution of human capital to the company and, by doing this, to play their role as strategic business partner more effectively,
- It would make international comparisons possible,
- It will help identify areas on which to focus to become more competitive,
- Depending on the results, investors may respond positively to the South African market,
- Researchers may find the opportunity to explore the factors

In conclusion an outline of the thesis structure will be given.

1.3 Outline of thesis structure

In Chapter 1 the context of the research and the relevance of the study was discussed and highlighted.

Chapter 2 will present the development of a comprehensive diagnostic model which will explain the major determinants of HCROI. However, HCROI cannot be properly understood without considering the other approaches to human capital measurement. Measurement plays an important role in demonstrating accountability, because accountability requires ensuring that concepts are replaced with evidence, that ideas are replaced with results, and perceptions replaced with assessments. Decisions cannot be justified

without proper measurement and possible problems cannot be highlighted and predictions for future goals cannot be made. Without sound measurement, results would be meaningless and misleading.

Although theorising is not adequately appreciated, it plays a critical role in determining the success with which descriptive research answers the research-initiating question. Theorising creates a series of descriptive and diagnostic research problems and descriptive and diagnostic research hypotheses. Although descriptive research aims at a description of some phenomenon, it is still guided by a broad theoretical hypothesis about the nature of the current situation and hypotheses on why it is as it is. The nature of the hypotheses that one come across in descriptive research differs from those found in explanatory research in that they tend to be presented in the format of an essay rather than that of a relational statement.

Chapter 2 will thus present a descriptive hypothesis on the *efficiency* and *performance* of JSE listed South African companies with regard to HCROI and the nature of and extent to which the existing response deviates from an ideal measure. The comprehensive diagnostic model developed in Chapter 2 to explicate the major determinants of HCROI, will form the basis of a set of diagnostic hypotheses explaining the anticipated deviation from the ideal calculation.

In a second section of Chapter 2, human capital return-on-investment will be dealt with; this concept will be defined and the measuring of it discussed. The antecedents (forerunners) of human capital return-on-investments will then be presented, to be followed with a comparison of a few international comparative levels of HCROI, namely of the USA, South America, Europe and Africa. The chapter will be concluded by discussing the need for a South African benchmark of human capital ROI.

Chapter 3 will deal with the research method. It will commence with a brief introduction, and the research problem and research hypothesis will then be highlighted. This study will be based on a descriptive hypothesis concerning human capital effectiveness and its impact on the performance of South African companies listed on the JSE with regard to HCROI. The sample used for this research is discussed under a separate heading, highlighting the size of the company and the sector it falls in. This is followed by the research design, after which a discussion of the measurement will follow. Chapter 3 will be concluded with a brief discussion of the method that was followed for data collection and the statistical analysis that was used.

Chapter 4 presents the findings of the research. The anticipated outcome was that the effectiveness and performance of South African companies will be lower than companies in developed countries. The findings in Chapter 4 will be presented in a few sub-divisions, of which the explanation of the HCROI results will capture most of the results as well as a comparison between SA and the international market.

Finally, a summary of this research will be presented in Chapter 5. Recommendations to HR managers and practitioners will be presented, as well as follow-up research which is recommended. Also, some limitations experienced with this research will be highlighted.

Chapter 2, which contains a review of the literature related to HCROI, will follow next.

CHAPTER TWO

LITERATURE REVIEW

2.1 Human capital and its measurement

2.1.1 Introduction

This discussion will highlight some important matters of measurement and begins by introducing the definition of measurement, after which characteristics of measurement will be explained. The definition of measurement suggested by Howell (1999), Becker *et al.* (2001) and Stevens (1968, in Aguinis, Henle & Ostroff, 2001) is used. These authors describe measurement as numbers that are assigned to attributes or properties of people, objects or events according to a set of rules. Thus, there always is a set of rules to be followed when numbers are assigned to something.

When one examines any concept it can always be seen to have some characteristics by which it can be identified. Aguinis *et al.* (2001) identified the following characteristics of measurement that can be derived from the above definition (p. 2):

- Measurement is focused on attributes of people, objects or events and not on actual people, objects or events.
- It uses a set of rules to quantify these attributes. It is important that rules be standardised and be clear and understandable. It should also be easy and practical to apply.
- Measurement furthermore consists of two components, namely scaling and classification. *Scaling* is used when the numbers are assigned to attributes of people, objects, or events to quantify them (how much of a certain attribute is present). *Classification* is used when people, objects or events fall in the same (or a different) category, based on a given attribute.

Furthermore, it is important to use the right terminology when research is conducted so that everyone will be using the same language; therefore it is important to point out the differences between the concepts of *statistics* and *measurement*. This is necessary because these terms are frequently used incorrectly.

Statistics are obtained when something is observed and a sample is drawn from such observations. Numerical values (like averages) are then computed to summarise the data from the sample. The values that are based on the sample are called statistics. As mentioned in the definition, *measurement* can be explained as numbers assigned to attributes or properties of people, objects or events and are based on a set of rules (Howell, 1999). Aguinis *et al.* (2001) added by explaining that measurement is essential to research since it allows the researcher to describe, predict, explain, diagnose and make decisions about issues under investigation. Without sound measurement, results would be meaningless and misleading.

The latest trend in the measurement of human capital concerns looking towards the future and predicting employee and business performance, while previous measurements only looked at past happenings. Fitz-enz (2010) introduces a fresh input to measurement when he uses the term *hucametrics* for predictive human capital metrics. He explains it as the new science of tracking and applying human capital data to predict employee and business performance and cause and effect. He continues by saying that it is like predicting winning business outcomes and making use of the best courses of action to win. Most organisations already have a set of human capital data available that can be formulated to foretell the future. Such data can also indicate the best possible courses of action with high accuracy. By using this, management can, with forward-thinking, create their own futures. Fitz-enz (2010) used a basic hucametric predictive model that every CEO can use with great success as a formula to predict winning business outcomes. This is:

$$\text{Competence } \times \text{ engagement } \times \text{ organizational opportunity} = \text{return on human capital}$$

This translates into “ready, willing, and able” (p. 109). He argues that if one wants reliable and forward-facing metrics which can give the best return on dollars invested in human capital, this is the way to go. This, however, should go hand in hand with synchronising the organisation’s activities to delight the customer. Fitz-enz (2010, p. 109) explains this as follows:

Human resources’ economic contribution is at the heart of maximizing the productivity of capital (profit), and human capital is usually the most expensive form of capital. It stands to reason that some foresight regarding the return on human capital has the potential of adding incredible value. So, in its complete form, the success formula provides CEOs with meaningful indexes and data columns that list the elements of each of these hucametric indexes on their computer spreadsheets each month, with a baseline ROI on human capital numbers and a projected ROI on human capital numbers. ... Many organisations have some form of these hucametrics squirreled away, sitting idle, and they simply need to be gathered

and mathematically calibrated to work in combination. But the CEO needs to get his or her hands dirty and drive it.

Fitz-enz, in other words, says that human capital is usually the most expensive form of capital but it can add incredible value. The only requirement is that these indexes and data columns must be used by CEOs.

Measuring of human capital is a new and strange concept to many companies and therefore feared by many managers. Fitz-enz (2009) however, says the analysing of human-capital should not be feared, but seen as a method of a logical analysis of business data as a basis for reasoning, discussion or calculation. Fitz-enz (2009; 2010) also says one should remember that everything in the business is measured by costs, time, quantities, quality and human reactions such as employee or customer satisfaction. Managers should know what aspect is most important at a given time and should track that aspect. This information should then be analysed by management in a meaningful way in order to predict and direct the outcomes of the business and its future.

As mentioned before, companies exist with the main goal of making money. It is therefore easy to forget the value that is contributed by the human aspect of the organisation. Fitz-enz (2000) emphasised that there must be a constant effort to balance financial and human values. He says that a manager's balanced focus and reporting systems are the driving forces in their financial performance. The focus on the interaction between human capital and financial outcomes is a leading reason for long-term financial success. Management should not constantly try to reduce human capital costs *per se*, but rather recognise the potential in people and try to unleash it. People are therefore not a cost to the company, rather an investment. This opens the revenue side of the income statement which can add much more value. The belief in people as a financial lever is extremely rare.

In the preceding section, the discussion indicated that managers should not fear measurement but should use it for better decision making for the future and that the value of the human value element should not be forgotten while striving for better financial benefits for the company. There are definite benefits for companies in making use of measurement for better decision making. Nunnally (1978, in Aguinis *et al.* 2001) is therefore of the opinion that good measures can be developed, which will allow several benefits to be reaped, if a reliable measurement process is followed. The benefits of measurement (p. 3) include that it contributes to objectivity; leads to quantification; helps to provide better communication; saves time and money, and leads to better decision-making about individual employees and groups within the

organisation. Kwon (2009) also believes that human capital measurement is important, firstly because so many nations have perceived the importance of human capital and therefore have tried to effectively and efficiently measure their human capital in order to understand the current status in the organisation. Secondly, human capital measurement is an important source of information because it suggests and implements policies regarding human resources. This section can therefore be concluded with a list of benefits derived from measuring human capital, namely:

- determine the value that people deliver in the company;
- determine whether there is a good return on the money invested in the people;
- indicate how to maintain the involvement of key stakeholders of the company; and provide the opportunity to improve the company's image to outsiders.

Different approaches to and measurement systems for measuring human capital is available, and will be dealt with in Section 2.1.3. While human capital is also measured at an organisational and individual level, attention will only be given to HC measurement on organisational level for the purpose of this study. Having discussed human capital measurement on enterprise level in Section 1.1.3, this concludes our introduction and directs the focus to a more thorough discussion of human capital and its definitions, as indicated at the beginning of Chapter 1.

2.1.2 Defining human capital

2.1.2.1 Definitions

Note should be taken of the debate around the term *human capital management* because of the interpretation thereof and its application in practice, plus its relationship to other HR functions. Regarding this, Lee (2011, p. 4) defines human resource management as “a business discipline that is concerned with ALL aspects of dealing with people working in organisations.” Some of the HR sub-functions overlap and this leads to debate which fluctuates between the terms Human Resource Management (HRM) or Human Capital Management (HCM) and HCM or Talent Management. This leads to a skewed branding and positioning of human capital management and the concept of measurement in the HR function naturally becomes problematic because of the various types of measurement that do not support human capital and human capital management.

The difference between HCM and Talent Management, as explained by Chrysler-Fox (2010) is defined as the sum of a person's abilities. Michaels, Hadfield-Jones and Axelrod (in Brewster *et al.*, 2008, p.128) list these abilities as intrinsic gifts, skills, knowledge, experience, intelligence, judgement, attitude,

character and drive. This definition more or less links with the one of human capital. Talent Management can be viewed as a process to provide for improved talent in the organisation through planning, development, management and the retention of talent. Taylor (2007) says these processes fit in well with Talent Management as well as with HCM, but he differentiates between the two by saying that HCM resorts to the strategic capability of the organisation and Talent Management not. Human capital management has the strategic meaning of people management which sees it firstly as a high-level strategic issue and, secondly, wants to analyse, measure and evaluate how people, policies and practices can create value (Stiles & Kulvisaechana, 2003).

As mentioned, there are different views on defining human capital since the concept also includes intellectual capital and talent, which may be confusing at times. Bontis and Fitz-enz (2002) regard human capital as the pure intelligence of the member working in an organisation, and “a primary component of the intellectual capital construct.” (p. 2). As indicated previously, Weatherly (2003, cited in Chrysler-Fox, 2010) defines human capital as an asset because of the collective sum of attributes, life experiences, knowledge, etc. which people invest in their work. Fitz-Enz (2010) recently defined human capital in a much simpler way when he said human capital comprises the employees of the company and the active contingent workers. Then there is the matter of talent which companies want to retain ‘at all cost’ otherwise they will lose this to the competition. Cascio (2010) describes talent as the potential of individuals – this includes the realisation of an individual’s capacities – and of groups and how they are organised. This also includes the employees in the organisation, and those who might join the organisation later. Bontis and Fitz-enz (2002) gave their opinion on the concept of intellectual capital and indicated that literature about this has increased remarkably during the last decade. They also categorise intellectual capital that can be found in an organisation in three categories (pp. 2-3), namely: *human capital* (this embodies the knowledge, talent and experience of the employees), *structural capital* and *relational capital*. Bontis (1998, in Bontis & Fitz-enz, 2002) says that, although there is general consensus on these three constructs, there is minimal empirical research to support this. Furthermore, he says that there is also no clear empirical validation for which construct directly acts as the driving force behind organisational performance, or whether a combination of the three is required. In this research talent and intellectual capital are referred to, but it is human capital that occupies centre stage in this study.

For Chen and Lin (2004) it is important to *approach* the definition of human capital in a certain way; they highlighted three ways to do so, namely:

- 1) the *transaction cost economy theory* – companies choose to employ personnel in the most efficient way. A company can either employ a new member from outside, or can train one that is in the company. Each of these approaches has its own costs. This theory claims that companies will choose the cheaper option by comparing the two options.
- 2) the *human capital theory* – this theory emphasises the fact that companies will decide on the amount of human capital they are willing to invest in by comparing it with the potential future benefits. Investment focuses on employee training in specialised skills, but would try and avoid these skills being used by other companies.
- 3) *resource-based view of the company theory* – skills that are the core business of the company's competitive advantages must be obtained from internal development within the company. General technology can be obtained from making use of outsourcing. A core skill would be the rareness of the product.

From the above it is clear that a company should invest in its human capital in order to gain a more competitive advantage over its competitors locally and/or globally because no company could exist without its people. This investment in people, thus *human capital investment*, can be defined as the input that companies make into talents and technology that will benefit competitive advantage (Porter & Stern, 2001, in Chen & Lin, 2004) and that are valuable and unique and should at all cost be kept away from other companies, especially the competition. Thus, employees with these qualities are qualified as human capital – one could say that talented people are of value to the company. The skills an employee possesses are the company's asset and that is why it is important for a company to invest in such an employee. The salaries that are being paid to such (talented) personnel, who are regarded as human capital, do not count as investment in human capital. Salaries are considered as the reward (Porter & Stern, 2001, in Chen & Lin, 2004). Ruchala (1997, cited in Chen & Lin, 2004) added that, when a company invests in human capital, it will improve production efficiency, the quality of the service or product, and product differentiation. This will ensure strategic competitive advantage over another company.

From the above it is clear that it is to the company's advantage to invest in its people, especially talented ones. This will ensure a competitive advantage over the competition. This concludes our explanation of what is meant by the term human capital. It is stated in Section 1.1.3 that human capital can be defined on an individual level (Bontis, 1998, cited in Bontis & Fitz-enz, 2002), an enterprise level (Cascio, 2010) and at national level. For the purpose of this study, only the enterprise level will be investigated, but

human capital at national level over against enterprise level will be discussed under the following heading.

2.1.2.2 Human capital at national vs. enterprise level

Although this research highlights only the enterprise level, *human capital at national level* will also be explained. Deloitte Development LLC[®] (2010) in SA advises and provides local managers with practical and pragmatic solutions which will improve and sustain business performance. They enable their clients to deal with the people dimension in the business journey. The success of business imperatives such as growth strategies and innovation, mergers and acquisitions, large-scale transformation, regulatory or technology adoption of right-sizing depend on their client's ability to energise and engage their people around the desired outcomes (p.1). The aim is that companies unlock the dynamic potential of their people with which the optimum business results can be achieved. Nationally, each company in SA wants to be more successful than others in the same market industry. That is one of the reasons why talented people are paid well in order to achieve that competitive advantage above others in the same industry. Competition drives organisations to perform better than others. Companies that gain success nationally have a better competitive advantage in expanding globally and have the possibility of financial prosperity there as well.

Human Capital at enterprise level: Each company has achieving financial success and prosperity as its main goal. Therefore organisations need people. However, people furthermore need managers to steer them into a strategic direction for optimum financial gain for the company. Enterprise-level metrics of human capital effectiveness is defined as follows: "When we choose enterprise-level metrics, we are telling everyone that their change and improvement programs must service these metrics" (Fitz-enz, 2000, p. 30). Stated differently, one can say that programmes that enhance change and improvement in the organisation should service the enterprise-level metrics. Cascio's (2010) view is somewhat different in that human capital measurement is important at enterprise level only because it improves decision making about talent and how it is organised. Although Cascio sounds a little sceptical he believes that good decision making contributes to organisational effectiveness, which is a positive aspect. A measurement system improves decision making because it focuses the attention on value-creating aspects and provides feedback. It also provides a valid justification for resource-allocation decisions. According to Becker *et al.*, (2001, cited in Chrysler-Fox, 2010), this is also true for any organisational measurement system.

Unfortunately, few see the advantage of human capital measurement for determining the value of human capital. Kearns (2004) believes that human capital measurement views people as a value (and not as a cost). He believes that there is a clear link between organisational performance and measuring organisational outputs like profit and revenue. Human resource measurement, on the contrary, only views people as overheads and not as value-adders. Pinto (2007), who supports Kearns, is of the opinion that the global market today is very competitive and this result in increased pressure to improve the return on investment (ROI) of the company. Human capital (people) is the greatest asset in the company and that is why a company should invest in this primary asset. The term “capital”, as in human capital, refers to something that is gaining or losing value, depending on how much is invested in it, or how the investment is made. One finds that it is mostly successful companies that treat people as assets, and that the financially orientated companies treat people as costs and overhead expenses. The management of successful companies invests in consistent, long-term leadership, and with committed talented people.

Since human capital is a valued asset, as seen above, one should measure it in order to determine the real value of it. Boudreau and Ramstad (2003) distinguish between three levels of human capital metrics. One can also refer to these levels as stages of implementation. These levels progress in an order of sophistication that can be expected, namely (1) efficiency measures which focus on cost as well as the efficiency of the human resource function, (2) effectiveness measures which reveal the impact of human resource activities on outcomes (like performance and employee competence), and (3) impact measures which display the impact of HR processes and programmes on performance on an enterprise level.

Pfeffer (1997a) on the other hand has a more critical view of human capital measurement, arguing that there are many politics involved in the measurement process of HR and chances of winning ‘this battle’ is less likely. He said this ‘game’ is played by rules set by others where there may seem victories, but only in the short term, but problems can be expected to evolve in the long term. Furthermore, he suggests that the obsession with measurement is mainly a United States manifestation. Many companies do not calculate the cost, for example of their training and development expenses. Such managers argue that training and development should just happen because it is the right thing to do. Companies with this attitude do not evaluate the financial impact that this has on the company. Pfeffer (1997a) continues his critique by saying companies do this because of their concern for their staff – as their investment into human capital, although managers do not really care whether the receiver of the training or development programme actually improves and can apply this new knowledge in their work or not.

Human capital at national vs. enterprise level: In SA, each company wants to be successful and be better than its competitor. That is why there are individual companies nationally who rise above others and

reach out to countries like China in order to improve their competitive advantage nationally. SA as a whole should strive to benchmark as equally successful against the rest of the world. SA should strive to be viewed as a leader to be reckoned with and should compete with the rest of the world.

This concludes this discussion of the difference between human capital on enterprise level and national level. The value that human capital adds to a company has been mentioned in previous sections. In the next section the discussion deals with how value can be added via the efficiency of a company's human capital. Since there is a difference between the terms effectiveness and efficiency, these two concepts will be explained.

2.1.2.3 Human capital effectiveness and efficiency

Many people use the terms *effectiveness* and *efficiency* interchangeably without realising that it has different meanings. To understand the concepts of efficiency and effectiveness, it is important to look at how other researchers define this topic. Carrell, Elbert, Hatfield, Grobler, Marx and Van der Schyf (1996, p. 123) say the following:

Efficiency is the rate of conversion while resources are being used. Efficiency is measured in terms of maintaining a satisfactory relationship between costs and benefits. The more efficiently a company controls its raw materials, the better the benefits. For instance, while a plant is being used, if it can produce 200 units per hour, it is more efficient than similar equipment producing 150 units per hour.

Efficiency, in other words, is the number of products that is manufactured in a certain time; the more products the better. Boudreau and Ramstad (2007), again, combine *efficiency* with an essential element of a complete decision framework. Without efficiency companies would not know their investments, and therefore it would be impossible to determine whether a significant return is produced. Efficiency can also get the leaders' attention and get them to really connect with the organisation's reporting systems. Boudreau and Ramstad (2007, p. 179) say that "efficiency is so compelling that organisations tend to emphasize it over effectiveness or impact".

Effectiveness, on the other hand, is defined as follows: "*Effectiveness* is measured in terms of 'doing the right things' for e.g. satisfying customer needs. In other words, somebody must want to buy the goods and services produced by the company." (Carrell *et al.*, 1996, p. 123). Thus, one could say that the

product is so ‘good’ that someone does not want to be without it. Boudreau and Ramstad (2007, p. 120), on the other hand, view effectiveness in the following way:

Effectiveness describes the relationship between talent and organisation performance and the portfolio of policies and practices. Effectiveness guides organisations to go beyond simply doing the same thing for everyone or the same thing that industry leaders are doing. Effectiveness is essential to strategy execution because it reveals where organisations can change the game by enacting programs and practices that uniquely reflect strategic pivot-points.

What Boudreau and Ramstad argue is that effectiveness helps with the execution of strategy because it directs towards possible changes in their ‘game’. Boudreau and Ramstad (2007) furthermore make their contribution on effectiveness by saying that one can see that decision making plays a vital role in the whole effectiveness scenario and should not be taken lightly. The whole idea of effectiveness is to outsmart the competitive company. If the human capital in the organisation cannot do this during their decision-making meetings, they will not be able to gain a competitive advantage for their own company against another.

For the purpose of this research, the focus will be on the measurement of human capital *efficiency*, which means the focus is on how much and how well an organisation can present its product with the best quality and service while responding to the demand at hand and, in doing so, outsmart its competition. This will include strategic decision making. With this in mind, particular approaches can be followed to enhance human capital measurement. This will be discussed in the next section.

2.1.3 Approaches to human capital measurement

One could explain an approach as a method that is used in dealing with something. Therefore the methods to approach human capital measurement will be discussed. HC measurement approaches can be viewed in a *traditional* way or a *contemporary* way. Cascio and Boudreau (2011, p. 20), describing the *traditional* way, indicate that HRM activities (associated with attraction, selection, retention, development, etc.) “commonly are evaluated by using measures of individual behaviours or statistical summaries of those measures. ... Statistical summaries of individual measures include various ratios, percentages, measures of central tendency and variability, and measures of correlation.” The hallmark of most HR measurements is the measuring of individual behaviours (traits or reactions) and to summarise it statistically.

The *contemporary* or current fashion is to measure HRM activities in economic terms. Today there is intense competition to attract and retain the most talented people nationally and globally. That is why executive managers more and more demand estimations of the expected costs and benefits of HR programmes, but communicated in economic terms. These measures should be strategically relevant to the organisation and thus decisions that affect organisational outcomes should be improved. Reporting employee turnover levels may seem like a pure administrative function to HR. However, the importance of analysing and understanding business and economic consequences of turnover amongst high performers (A players) who are hard to replace can often be seen when these reports are kept up to date. To develop measures like these requires attention to appropriately calculate turnover and statistical formulas that summarise it. It requires an interdisciplinary approach that will need to include information from accounting, finance, economics and behavioural sciences (Cascio & Boudreau, 2011).

One of the main reasons why HR measures are used is to improve important decision making about talent and how it is organised (Cascio & Boudreau, 2008). The decision-science-based framework, also referred to as “LAMP” (Cascio & Boudreau, 2008, p. 1), helps in guiding HR measurement activities toward a greater strategic impact. It is important to understand that measurement drives decisions, organisational effectiveness and strategic success. The aspect of decision making is so important that it has been highlighted in many of the discussions so far.

To conclude this introduction to approaches: Cascio and Boudreau (2008, p. 8) highlighted four key HR measurement approaches to human capital measurement that are in use today, namely:

- Efficiency of HRM operations, e.g. cost per hire
- HR activity and “best-practice” indexes, e.g. human capital benchmarks
- HR dashboard or HR scorecard, e.g. how HR function (or organisation) meets customers, financial markets’ goals
- Causal chain, e.g. models that link employee attitudes to service behaviour to customer responses to profit.

Previously it was said that an approach to measurement is a method. The three scorecard approaches therefore will be discussed for a better comprehension of these measurement methods. This will be followed by HC Accounting and HCROI.

2.1.3.1 The Balanced Scorecard

The Balanced Scorecard approach was developed by Robert Kaplan and David Norton in the early 1990s. It was developed for companies to no longer gain sustainable competitive advantage exclusively by developing tangible assets. The matter of building *intangible assets* or *intellectual capital* became a critical success factor for any company in creating and sustaining competitive advantage. Kaplan and Norton (1996) therefore developed the balanced scorecard as a strategic management system. This scorecard sees executive managers as steering people by whom decisions are made and strategies are developed.

With this approach, managers are able to look at their business from four important perspectives and can therefore focus on those measures that are most critical. In order to activate the scorecard, managers have to “translate the company goals which relate to the four perspectives into specific measures that reflect the factors that really matter” (Brewster *et al.*, 2008, p. 148). Brewster *et al.* highlighted these four *perspectives* as follows:

- 1) *A customer perspective*: Management should be concerned with how customers see them (important is measuring lead time (e.g. time from receiving an order to delivering), quality, performance, service and cost).
- 2) *An internal perspective*: This refers to the internal measures that must be taken to meet customers’ expectations.
- 3) *An innovation and learning perspective*: The question for this perspective is: Can the company continue to improve and create value?
- 4) *A financial perspective*: Finally, managers should look after their shareholders. Cash flow, quarterly sales, growth, operating income by division, increased market share by segment and return on equity should be measured. In order to achieve this, management should again articulate goals for these components. Typical financial goals have to do with profitability, growth and shareholder value. These goals should be translated into specific measures. In the measurement of the financial performance it will be clear whether the strategy, implementation and execution of the company contributed to the bottom-line improvements.

This scorecard also produces a *balance* between dimensions. The developers of this scorecard, Kaplan and Norton (1996), strongly believed that this balance exists between the different dimensions and identified the following aspects:

- The four key business perspectives, namely financial, customer, internal processes and innovation.

- The way that the organisation sees itself and how others see it.
- Matters in the short run and in the long run.
- The ability to see the situation at a moment in time and the change over time.

Not only does this scorecard produce a balance between dimensions but it also helps in executing management processes. Knapp (2001, p. 2) added additional information to Kaplan and Norton's scorecard by saying that this scorecard enables management to execute strategic management processes. He listed four strategic management *processes*, namely:

- “Clarify and translate vision and strategy
- Communicate and link strategic objectives and measures.
- Plan, set targets, and align strategic initiatives.
- Enhance strategic feedback and learning.”

According to the said researcher, these four strategic management processes are the keys to the Balanced Scorecard theory. Not only does this scorecard help executing strategic management processes, but it also helps management to focus on the company's performance. Huselid and Barnes (2003) expressed their view that the balanced scorecard is a helpful tool for managers. It helps them to focus on the drivers or leading indicators of company performance. It refers to, amongst others, costs, quality and new product cycle time. It also directs towards the usual lagging indices of company performance like return on investment (ROI) or shareholder value. The balanced scorecard framework aims to encourage managers to devote as much attention as possible to the leading indicators of company performance as they do to the lagging indicators (financials), because the leading indicators influence financial outcomes over which the company has control.

Another very important aspect of this scorecard is that it includes the importance of stakeholders in the organisation. Ulrich (1997) explained that each business has different stakeholders with whom they should interact in order to carry on with their business. He believes it is only lately that the stakeholder model has developed into what is called a *balanced scorecard* which is built on the understanding that it must meet the requirements of three main stakeholders, namely the investors, customers and the employees. This makes it possible for a business to be regarded as successful.

Brewster *et al.* (2008) viewed the following two of the balanced scorecard as follows:

- Many of the competitive elements are brought together with the balanced scorecard, for example improving quality.
- “It guards against the underutilisation of assets by allowing management to see whether improvements in one area takes place at the expense of another area.” (p. 152).

According to Brewster *et al.* (2008, p. 152) the strength of the scorecard lies in the fact that it “provides a simple conceptual and diagnostic tool to ensure that companies utilise the right processes and people to drive customer and business performance – the goal of any company striving towards gaining a sustained competitive advantage”. Here, Brewster *et al.* explain that the Balanced Scorecard is a tool which helps companies to use the right processes to drive customer and business performance in order to gain a sustained competitive advantage over other companies. This also supports what was said concerning the four strategic processes.

Unfortunately weaknesses were eventually experienced with using this Scorecard, which led to the development of the HR Scorecard.

2.1.3.2 The HR scorecard

This scorecard was developed to strengthen the weakest feature of the Balanced Scorecard, namely to solve the question of: *how best to integrate HR's role into the company's measurement of business performance?* Therefore the HR scorecard is based on the relationship between HR and company performance (Brewster *et al.*, 2008).

Huselid and Barnes (2003), in order to complement the above, said that they saw the HR Scorecard framework as an example of a larger process that is described as *human capital measurement systems (HCMS)*. When correctly designed and implemented, it should focus on the prediction and feedback of the company's people-related assets. HCMS include any efforts to design a measurement system that describes how human capital creates value in an organisation. However, “it also describes and facilitates the use of this measurement system on an on-going basis to help make more effective decisions about the management of people” (Huselid & Barnes, 2003, p. 4). These researchers make a distinction between HR Scorecards and HCMS, though, because they believe there may be other approaches to achieve the same end result. For this reason they wanted to separate the study of a particular outcome, namely better management of human capital through measurement, with a specific process, namely the HR Scorecard.

What must be stressed with this scorecard is that it is not fixed but can be developed continuously. Therefore, Brewster *et al.* (2008) accentuated that the building of the HR scorecard is not a once-off event but that HR leaders should stay in tune with changes in the performance drivers that HR is supporting within the company. They are of the opinion that, if changes occur, the HR scorecard must shift accordingly. Furthermore, Ulrich, Becker and Huselid (2002, p. 1) firmly believed that “*The HR Scorecard allows HR managers to ask questions like ‘What is really important?’ ‘What should this tool do for me?’ and ‘How should managers outside of HR see HR?’*” The researchers stressed that one must remember that this scorecard is not a magic potion but a handy tool to collect rigorous, predictable data to direct the company’s attention to the most important elements in the HR function.

As with anything that is introduced, there are benefits to using this scorecard. Ulrich, Becker and Huselid (2002); and Brewster *et al.*, (2008, p. 153) identified several of the benefits of using this particular HR Scorecard and provided the following reasons (p. 1):

- “It reinforces the distinction between HR do-ables and HR deliverables
- It enables you to control costs and create value
- It measures leading indicators
- It assesses HR’s contribution to strategic implementation and ultimately, to the bottom line
- It lets HR professionals manage their strategic responsibilities
- It encourages flexibility and change.”

Unfortunately, the HR Scorecard still had some shortcomings. It was refined further and the Workforce Scorecard was developed. This will be addressed next.

2.1.3.3 The Workforce Scorecard

The Workforce Scorecard was developed after researchers had reached the conclusion that both the Balanced Scorecard and the HR Scorecard had shortcomings (Huselid, Becker & Beatty, 2005, in Brewster *et al.*, 2008). They realised two things, namely (1) that the impact of the activity on organisational outcomes was far more important to companies, and (2) that it was not the activity that counted as much. They gave the example that it was not important to count the number of training days provided, but the impact that the training had on the individuals and the organisation. These authors furthermore expressed the belief that companies were seriously in need of a:

- Business strategy
- Strategy for the HR function, and a

- Workforce strategy.

According to Brewster *et al.* (2008), all three of these strategies are operationalised in each of the three scorecards that were discussed, but that the Workforce Scorecard is crucial in the execution process of strategies in companies. Another important aspect that Brewster *et al.* (2008) highlighted was that, when working with the Workforce Scorecard, investments in the workforce should be shown to help in the process of executing strategy through three components, namely:

- Workforce mind-set and culture
- Workforce competencies, and
- Workforce behaviour.

These components become the link between strategy, HR investment and the workforce. This leads to workforce success, according to Brewster *et al.* (2008).

It has been indicated that the balanced scorecard was the initial starting scorecard but shortcomings led to the HR scorecard being developed, which was followed by the development of the workforce scorecard. Another measurement approach that came to the fore is that of human capital accounting.

2.1.3.4 Human capital accounting (metrics)

Human capital accounting can be explained as the process by which human capital is recognised and measured (Chen & Lin, 2004). The outcome of the measured information is then provided as a reference to users. With this reference, accounting should be used not only to improve the quality of financial statements but also to include the variable of human capital, which is expressed in financial statements in management decisions. The reason for these accounting figures is to provide useful information to the users of financial statements so that human capital is not seen as a negative factor when calculating net income, but for companies to capitalise investments in human resources. Thus, human capital accounting information can increase the *efficiency* of human resource management. Monetary measurements (where analysis is applicable) can be divided into input and output. It expresses the value of human capital in monetary figures. Non-monetary measurements can be simplified by means of the Likert model (Chen & Lin, 2004).

As indicated before, human capital accounting is a process that is recognised and measured. Many managers, however, do not know how to apply human capital metrics with regard to its influence, the formulation of it and the implementation thereof. This results in the lack, firstly of measurement and, secondly, of a contribution to human capital. With this said, the existence of human capital metrics is

confirmed. The fact that it is wrongly applied affects the bottom-line effect and market value of the organisation. Literature and research on strategic human capital metrics are also very limited (Chrysler-Fox, 2010), especially for South Africa.

It is so easy to lose focus and put too much emphasis on the accounting part of measurement and forget about the human aspect and the value that humans contribute. That is why Fitz-enz (2000) stresses that the accounting part should not be overemphasised. He argues that, if the value of people has to be measured, the aspects of *economy* and the *spiritual* must be acknowledged as well. It is easy to make calculations that focus on the economical side, but one must not forget that the measures that contribute to value are measures of human value as both economic units and as spiritual beings. Only people can generate value and they do that through their intrinsic humanity, motivation, learned skills and tool manipulation. Furthermore, the researcher (Fitz-enz, 2000) is of the opinion that focusing only on pure accounting fails on two levels: it (1) only looks inside the organisation (it conserves the assets of the enterprise), and (2) it focuses on the past. He states that it is essential that our eyes be taken off the past and to focus on the future. There should be a focus on creating wealth; in other words, there should be a focus on actions that will extract value from the market place. Fitz-enz (2010) furthermore said that, although human capital measurement (HCM) has gained a lot of ground over the last 20 years, it still remains detached from business strategy. Fitz-enz (2010) mentioned that a recent report from The Conference Board showed that only 12% of the respondents reported that they made use of human capital measurement in order to meet their strategic targets or key performance indicators (KPI). However, a staggering 84% of this group indicated that they will definitely increase the use of these measurements in order to meet their goals during the following three years. Chrysler-Fox (2010) mentioned that the most metrics that could be identified focus on effectiveness, cost and volume as an objective. Results on these metrics indicated a lack of correlation between the importance of and current utilisation of these metrics. He indicated the lack of credibility of the HR professionals that limits their influence on business strategy and also results in unsuccessful initiatives for corporate change. Smith (2003), on the other hand, argued that most metrics only focus on operations and has no input in the implementation of a business strategy. He believes this results in limiting the choice of metrics for the use of an executive scorecard whereby the organisation's performance can be managed by:

- aligning corporate goals;
- the selection of the appropriate strategy to achieve these goals, and
- the measurement of these goals.

Furthermore, Smith (2003) accentuates that appropriate metrics are available for a dashboard⁴ which measure an organisation's performance on a short-term (day-to-day) basis.

In an earlier article by Fitz-enz (1994) he talked about a new scorecard for HR and with this he referred to a scorecard of *HR's effectiveness*. Back then he was already of the opinion that HR should add value to the company, in other words HR should have a new vision of HR's purpose in the company; and that it should have a more effective relationship between itself and its internal customers; and should have a quantitative performance-measurement system in place. James Harrington (quoted in Fitz-enz, 1994, p. 1), a quality consultant, made this powerful statement when he said: "The importance of measurement can't be overemphasized. If you can't measure it, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it." Harrington hereby stresses that measurement is important and it must be understood in order to make improvements in the company. Fitz-enz (1994, p. 1) then added this last sentence to complete the above statement: "If you can't measure it, you can't communicate it to business people", in other words, no one will know where the company is heading.

In recent years there is a growing interest in intangible assets instead of only looking at tangible assets. Huselid and Barnes (2003) confirmed that there is a growing confidence in intangible assets as a source of competitive advantage to companies. Therefore many companies have developed a measurement system to support the management of these resources. Since the growing interest in intangible assets, which enhances competitive advantage and the development of measurement systems, the question regarding the best selection and sophistication of metrics has been raised. The traditional measures of HR productivity have been inappropriate and irrelevant because it focuses on tracking administrative activities and costs, as emphasised by Wintermantel and Mattimore (1997).

This concludes the discussion on human capital accounting which is still a field that is carefully investigated by many. To follow on the above, the attention is directed towards the calculation of Return-on-Investment in human resources, which mainly comprises a new viewpoint of Fitz-enz and his team and will also be the next discussion. Caudron (2004, p. 1), pointing to Fitz-enz, had this to say:

⁴Dashboards provide alignment, visibility and collaboration across the organization by allowing business users to define, monitor and analyse business performance via key performance indicators (KPIs) (<http://www.witinc.com/resource/attach/124/RoadShowMay18192005Quaid.pdf>)

Jac Fitz-enz proposed a radical, anti-establishment idea. Human resources activities and their impact on the bottom line could—and should—be measured. The reaction was apathy, disagreement and disbelief. Now, after arguing the importance of measurement and accountability for three decades, Fitz-enz is acknowledged as the father of workforce management metrics, and the accolades bring a pleasant satisfaction.

2.1.3.5 Return-on-Investment in human capital management

The calculation of ROI is not the latest ‘fad’ within management but has been a valuable measurement tool for a long time; the Harvard Business Review, according to Phillips and Phillips (2007), proclaimed ROI as the tool to measure results as long ago as the 1920s. Over the last couple of years the application of this concept has been expanded to all types of investments, including human capital investment. There also is a noticeable demand for evidence of positive returns on investing in people and in HR programmes. Key clients who are funding HR initiatives today require critical evaluation data. Measuring ROI can be a valuable tool for communicating the positive impact of HR’s work in the organisation, but, for a ROI process to be feasible, it must balance many issues, including feasibility, simplicity, credibility, and soundness (Phillips & Phillips, 2007).

The Return-on-Investment concept always is a very relevant business topic because every organisation wants to be financially profitable. ROI calculations can help companies with calculating performance improvements; calculating the rand value benefits; computing investment returns, and also help with improved and informed decision-making based on calculated benefits and returns. Phillips and Phillips (2007) explained the calculation process as a process in which benefits and costs are being used when they say (p. 5):

The return on investment is calculated using benefits and costs. This means that each \$1 invested in the program returns \$1.50 in net benefits, after costs are covered. The benefits are usually expressed as annual benefits for short-term programs, representing the amount saved or gained for a complete year after the program has been implemented. Although the benefits may continue after the first year, the impact usually diminishes and is omitted from calculations in short-term situations. For long-term projects, the benefits are spread over several years. The timing of the benefits stream is determined before the impact study begins, as part of the planning process.

To supplement the above, Fitz-enz (2010) established a formula for calculating HCROI in his attempts to measure the human capital return on investment which resulted in the following formula:

$$\text{HCROI} = \frac{\text{Revenue} - (\text{Expenses} - \text{Pay} + \text{Benefits})}{\text{Pay} + \text{Benefits}(\text{all labour classifications})}$$

The elements that he used therefore are revenue, expenses and pay and benefits. Fitz-enz (2000) states that HCROI analysis uses the same principles as are used with standard accounting instruments, like income statements and balance sheets, but the information that is required is not found on corporate financial documents. It also teaches how one measure affects the other. What is important, though, is to know what the goal is; what the competitors are doing; the type of information that different people will need to manage the whole process of reaching the goal to be specified; and, lastly, the team should learn how the interaction between people, data systems and information facilitates an impact on profitability. It comes down to *where, what, who, when* and *how*. The ideal is to find out how fast and in what direction the competition is moving. According to Fitz-enz, this is benchmarking which is discussed in Section 1.1.5.

That the value that humans contribute to the company are overlooked, has been mentioned frequently, but human capital does play an enormous role in the creation of value. Making use of human capital measurements (HCM) can contribute greatly to the achievement of the company's strategic goals. Fitz-enz (2010) lists the following achievements of company goals:

- HCMs can be used by managers to identify and pay attention to key competencies, which build a competitive advantage.
- HCM can also improve the evaluation of strategy implementation. There is an expectancy that the more advanced a company is in its implementation of human capital measurement, the higher its performance will be. However, it should be noted that the implementation of HCM is a very difficult and extended process (time-wise) and companies frequently cut the cost to this project. One also has to view HCROI as a metric that adds value rather than a measure of productivity (Scorecard Metrics for HR, 2009). If a HCROI calculation has a low value it usually indicates that the structure of the workforce is not efficient or that the organisation has an inappropriate product offering or pricing strategy.

Naturally there are benefits to HCROI because this is why this research was initiated. Phillips and Phillips (2007) highlighted the following benefits when using the ROI process

- that the client and the HR staff will know the specific contribution that an HR program had
- “Measuring ROI is one of the most convincing ways to earn the respect and support of the senior management team” (p. 7)
- “The client, who requests and authorizes an HR program, will have a complete set of data to show the overall success of the process... the entire team of stakeholders focuses on results.” (p. 7)

Other advantages of calculating HCROI in a company is that it will help improve recruitment and training processes and would help determine the efficiency level of the HR department. In addition, good selection processes regarding employees will help enhance the performance of the company, especially through the selection of talented people. At present, the business environment is very competitive and financial Balanced Scorecards should aim to integrate Human Capital metrics. These measurements will have a noticeable impact on the growth of the business (Scorecard Metrics for HR, 2009).

In conclusion, one can say that the selection and application of human capital metrics are not well understood. If *what* the metrics of HR measures is not understood well, it cannot add value in influencing the formulation of a business strategy. It will therefore not be possible to transform HRM into a strategic partner.

After this discussion on the different approaches revealed in human capital measurement, these approaches will be evaluated in what follows.

2.1.4 Evaluations of human capital measurement

Approaches to human capital measurements were discussed in the previous section. In this section, the different approaches will be critiqued. The initial scorecards will be discussed first.

The *Balanced Scorecard* attracted a lot of criticism from different researchers. This popular scorecard, as mentioned before, was introduced by Kaplan and Norton (1996). Norreklit (2000) pointed out that some of the criticism focused on technical flaws in Kaplan and Norton’s methods and design but that it has driven the evolution of the device through its various Generations over time. Furthermore, some researchers only focused on the lack of cited support. Jensen (2001) is of the opinion that this scorecard does not provide a bottom line score or a unified view with clear recommendations. He said it is only a list of metrics. Rohm’s (2004) critique was that there are unanswered questions and he suggested that these unanswered questions are related to things outside the scope of the Balanced Scorecard (e.g. the

development of strategies). Another criticism is that the scores were not based on proven economic or financial theory and that the process was entirely subjective.

The next critique concerns the HR scorecard. Owens (2010) regards the implementation of the *HR scorecard* as the most challenging and largest disadvantage. Furthermore he said everyone in the company should accept this process and its plan – on all levels of the company – in order to be effective. A huge stumbling block to putting this scorecard into operation is the resistance to change by many people in the company. It also adds to a lot of administrative work and perceived pressure to managers that may be viewed as unnecessary additional work.

The *Workforce Scorecard* also faces challenges when it comes to the implementation thereof. Brewster *et al.* (2008, p. 158) highlighted three challenges that occur with the successful implementation of the Workforce Scorecard, namely:

- *The challenge of perspective* – do all the managers in the company understand how the capabilities and behaviours of the workforce can drive the execution of strategy?
- *The challenge of metrics* – have management identified “the right measures of workforce success, leadership, workforce behaviour, workforce competencies, and workforce culture and mindset?”
- *The challenge of execution* – “do our managers have the access, capability, and motivation to use the data to communicate strategic intent and monitor progress towards strategy execution?”

In discussing these scorecards in the previous sections it seemed as if there is little difference between them and that one could become confused by what seems as if they are intertwined. Huselid *et al.* (2005) confirm that these three scorecards have similarities. The listed similarities included that:

- It is integrated with the work of Kaplan and Norton (1996),
- It focuses on strategy execution because of its focus on the operational (Huselid *et al.*, 2005),
- It is based on a system of leading and lagging indicators (Performance drivers and outcome metrics),
- It includes tangible and intangible assets (Becker *et al.*, 2001).

This concludes our critique of the scorecards. Metrics is the next point of discussion. Pfeffer (1997a) was the main critic concerning this topic. He highlighted some disadvantages related to *human capital accounting*. He regarded metrics merely as a USA phenomenon. He also claimed that the heightened emphasis on cost and cost containment could become something in which management would quickly become skilled in managing numbers. As with many measurements, the measuring of HR is not without challenges. Pfeffer identified the following challenges that have to be taken into consideration:

- 1) With some of the measurements that are given, one cannot say for sure whether the resources that are spent, are spent wisely and effectively.
- 2) There is an opportunity to play with the ratios, and clever managers quickly become skilled in managing these numbers if they are evaluated by appearance of effectiveness, efficiency or performance.
- 3) Some organisations “have expanded the measurements to focus on employee attitudes and turnover and internal customer satisfaction with the services that HR provides, relying frequently on surveys or interviews” (Pfeffer, 1997a, p. 361). He concluded that these ratings sometimes are subject to numerous forms of bias, for example through asking friends to give a good rating.

One would have thought that HCROI was such a well-considered concept after Fitz-enz had developed the idea, that everybody would accept this with open arms. However, as will be shown, Boudreau and Ramstad (2007) declared that it was not the Holy Grail of everything. Berman and Knight (2008) therefore also had their doubts. They were not sure that *ROI* was the best measure to use with HR. According to these researchers, the typical ROI methodology used in HR does not take into account the *time value of money*, which is one of its downfalls, according to them: “a dollar in your hand today is worth more than a dollar you expect to collect tomorrow – and its worth a whole lot more than a dollar you hope to collect ten years from now” (Berman & Knight, 2008, p. 178). Another disadvantage concerned the calculation of ROI, which is a long and tedious process of accumulating all the data in order to determine the HCROI. Finally, it is also difficult to assess the morale and satisfaction levels of staff. Boudreau and Ramstad (2007) had their doubts about ROI and provided the strongest critique against it when they accentuated that many regarded calculating the ROI of human resource programmes and practices was the Holy Grail of Strategic Human Resource decisions and that the only goal of the decision science was to create valid and credible ROI numbers. It is useful to understand ROI in HR programmes and practices, but it will not provide the total solution to the need for a decision science or the dilemma of talent segmentation. Furthermore, Boudreau and Ramstad (2007) declared that many of the ROI calculations do not change the path of the decisions that are made regarding human capital and organisational resources. It is used to demonstrate the value of HR investments *after* it happened. The focus of ROI is wrong; it should rather be focused on necessary information, like whether the return exceeded some minimum required hurdle rate or threshold. If the return exceeded, it would be irrelevant whether it exceeded by 1% or by 100%. According to them, a very good HR investment may be “shot down” because of a calculation error on ROI. Another false belief about ROI was that, if ROI had a positive number, it would have a successful impact. This is not always the case. Boudreau and Ramstad

(2007) gave the example that, if an advertisement increased sales amongst those who saw it, it did not mean that it was the right target group (customer). If the right group had been targeted, the sales would have been even higher. Calculations concerning ROI usually focus on one HR investment at a time, but do not consider how investments work together as a portfolio. Boudreau and Ramstad (2007) therefore say it is essential that, if one wants to understand ROI and to put it in a decision context, it does require a framework that distinguishes as well as integrate efficiency, effectiveness and impact.

In spite of the negative aspects of ROI highlighted above, this research will use the most informative *HCROI* as measurement. The purpose of *HCROI* is to look at return on investment with regard to monies spent on employee pay and benefits. When expenses are subtracted (but not pay and benefits), an adjusted profit figure is produced. When the adjusted profit figure is divided by human capital costs (pay and benefits), it produces the amount of profit derived for every dollar invested in human capital compensation (training, etc. excluded), in effect, the leverage on pay and benefits expressed as a ratio. This will help managers to make more informed decisions and managers will know how well the company performs on its own and in comparison with others, and they will know how to adapt the path of the company for the future with the strategic goals in mind.

The reason why *HCROI* is a good measure to introduce into the workplace is because it is a very cost-effective way of measuring, since the data are readily available. Once the information is available, benchmark comparisons can be made internally and externally. This information provides valuable information to the stakeholders and the company itself, and better decisions can be made. The information to make the calculations is based on proven principles and methodologies. It also provides financial evidence of ROI. It is hoped that organisations one day will naturally include this figure in their Annual Reports as a benchmark figure.

This concludes the discussion on the measurement approaches and the critique against it. Issues around human capital measurement will be discussed next.

2.1.5 Issues in human capital measurement

Measuring and modeling human capital is extremely critical because of the increasing strategic importance of intellectual capital management in any organisation (Bontis & Fitz-enz, 2002). These researchers believe that HR should definitely establish their credibility by making the HR function more accountable in financial terms. Sadly, many HR managers are still perceived as not having the expertise

to carry out measurements and, if they do measure, the measures lack precision or are too difficult to execute. However, Bontis and Fitz-enz (2002) also say that the attitude of the accounting and finance managers in the organisation also make it more difficult to present human capital in financial terms. From the above one can conclude that managers still perceive human capital measurement as a challenge.

The term *metrics* is often used in this thesis. In the 1970s metrics was known as “measurement”. One can thus say it is an old term, offered with new flair. No wonder some HR professionals are still confused by which term to use, which prevents them from becoming human capital intelligence officers (Chrysler-Fox, 2010). The word *metrics* has become more popular over time and now applies to any application (or use) of numbers. Metrics therefore are the numbers that give an indication of how well a specific function in an organisation is performing, like HR. Fitz-enz (2010, p. 183) says: “The numbers provide a context around which performance can be analyzed more precisely than through anecdotal commentaries. Metrics can be expressed as percentages, ratios, complex formulas, or incremental differences.”

Metrics can also be tracked over a period of time to show different trends. There is no use in running numbers just for the sake of having data just to have it ready for when someone may, perhaps, ask for it. It would be an absolute waste of time. But Fitz-enz (2010, p. 183) admits: “Data that can be turned into intelligence for decision making, however, can be valuable.” Data can be gained from internal sources (payroll, employee surveys, financial statements, etc.) or external sources (benchmarking with other industries, competitor actions, survey research, the Internet, etc.) and should be used to the benefit of the organisation.

Another issue in measurement is analytics. *Analytics* has a lot of power and therefore Fitz-enz (2010) mentions that knowledge forms the base from which predictions can develop. Without proper knowledge, no tools or structure would exist. He says that (p. 15), “If knowledge is power, then foresight is the lever to take advantage of that knowledge. This is where predictive management enters”. Furthermore, analytics provides valuable knowledge that can be used for future decisions. If a prediction for the future is made with a high degree of probability, the following four things highlighted by Fitz-enz (2010, p. 15) are of essence:

- 1) comprehension of past and current events,
- 2) understanding not only trends but also the drivers behind them,
- 3) being able to see patterns of consistency as well as change, and
- 4) having tools to describe the probability of something in the future.

To give substance to the above, one can describe analytics as a “mental framework, a logical progression first and a set of statistical tools second” (Fitz-enz, 2010, p. 4). Many people see it as only statistics. According to dictionaries, The term *analytics* involve the science of analysis, with the origin in the Greek word *analutika* (Oxford English Dictionary, 2012). This also includes the principles of mathematical analysis. What is important is to highlight the fact that analytics in HR is definitely a communications tool providing a language that everybody can understand. Fitz-enz says that, if one wants to know why some situation in the organisation is changing, there should be a moving up from metrics and benchmarking to statistical analysis. This ultimately leads to making predictions and optimisation. Fitz-enz (2010) also is adamant that management cannot make effective decisions based solely on data or metrics. Management should upgrade to analytics and eventually to business intelligence, and that is where HCM:21 (Human Capital Management model) is relevant. Information should be collected from *enterprise resource planning* (ERPs), HR transactional systems, and financial, sales, and production systems and this information should be used to build up data warehouses. This information will make it possible to tell what happened in the past. By using analytics, it will help one to understand outcomes and highlight forecast opportunities. The more the business becomes competitive and global, the more should forecasting, predictability and advanced modelling be used. Organisations will gradually become aware of the need for and value of embracing this more sophisticated application. The process of understanding past behaviour and predicting future outcomes is called predictive analytics.

In the above paragraph it was highlighted that it is important for companies to look at the future and make changes based on the right decisions. This is referred to as predictive analytics. There are a number of benefits to *predictive analytics*. To mention two: it helps with looking forward in order to anticipate proactively, and it helps to get a higher return on your data investment – the information of what happened in the past, what is happening now and what will happen is most likely to happen in the future (Fitz-enz,2009). Furthermore, according to Fitz-enz (2010), in understanding the efficiency of the process, the company will be able to predict the outcomes for a given human capital investment in the organisation by plotting down a value ladder, as shown in Figure 2.1, from which the value of each step can be seen.

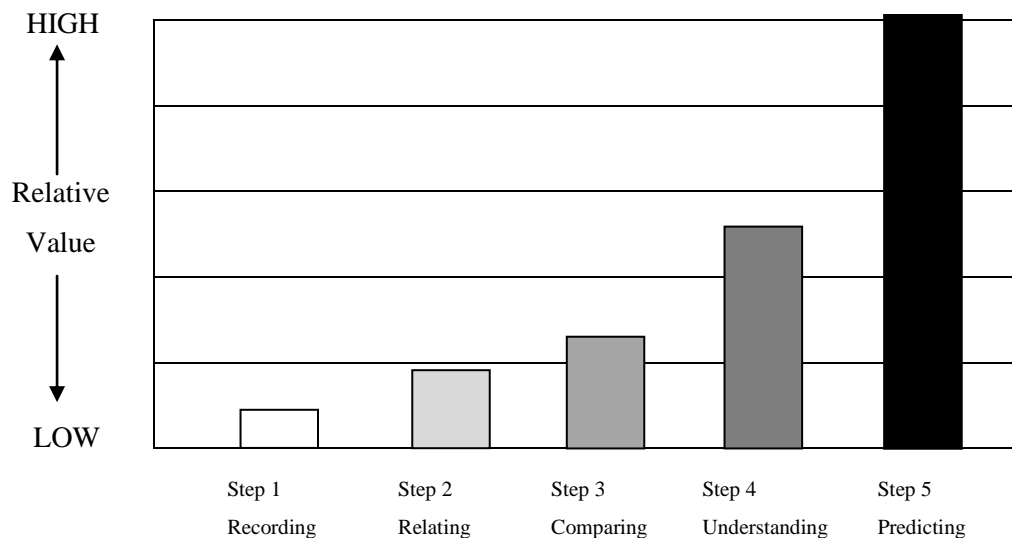


Figure 2.1. Ascending values of measurement. The HR Analytics. Predicting the economic value of your company's human capital investments by Jac Fitz-enz, 2010, p. 11. Copyright 2010 by AMACOM, a division of American Management Association, 1601 Broadway, New York, NY 10019.

Most organisations start from Step 1 where they collect the basic data on cost, time and quantity. This is also where Fitz-enz and his team started in 1978.

Another issue in human capital measurement is that of *predictive initiative*, which closely relates to analytics. Fitz-enz (2010) says HR has moved from horse and buggy to airplane, where the attention can be shifted to *predictability management*. This term basically refers to managing today for tomorrow! Predictive management or HCM:21[®], which took 18 months to be developed by Fitz-enz's team and which is called *Predictive Initiative*, is "the first holistic, predictive management model and operating system for the HR function" (p. xiii). It was launched in 2008 and has been successfully applied in the USA and overseas in the industry, as well as government. The predictive management model is driven by human capital analysis, especially the HCM:21 system which consists of four phases: (1) Scanning, (2) Planning, (3) Producing, and (4) Predicting. The HCM:21 model is a model and method for managing human capital, talent or people.

It is clear that management nowadays should look at the future and better predict the path that companies are taking; for this to happen, effectiveness and efficiency play a role. This is where Lawler *et al.* (2006) contributed three measurement types that organisations can collect and make use of, namely *measures of efficiency, effectiveness and impact*, each of which has different metrics and analytics. When they are used together, however, they complement each other. The most common of the three are *efficiency measures* which are basic to the HR function and connect readily to the accounting system. More attention can be given to *measuring effectiveness* by focusing on turnover, attitudes and bench strengths. *Impact* is the one that is rarely considered by organisations although an emerging emphasis on this matter is noticeable; it refers to, for example, the effect that improving the quality of different talent pools has on organisational effectiveness.

This concludes issues arising in human capital measurement. The following different issues have been highlighted: of metrics and analytics, of predictive analytics, predictive initiative, and the role that efficiency plays has concluded this section. A summary and some conclusions will follow now to finally close the matter of human capital and its measurement.

2.1.6 Summary and conclusions

The section discussed under point two, namely human capital and its measurement, commenced with a brief introduction explaining what human capital and its measurement is, followed by the different definitions of human capital. The concept of human capital at national level and at enterprise level was discussed. For the purpose of this study, the enterprise level is of importance for this research. An explanation of the differences between effectiveness and efficiency followed and the decision to focus on efficiency as the main aspect for the purpose of this study was explained.

This was followed by the next point of discussion, namely the different approaches to human capital measurement. Three scorecards, namely the Balanced Scorecard, the HR Scorecard and the Workforce Scorecard were discussed, followed by human capital accounting and concluded with a discussion of ROI in human resources. The importance of HCROI was also highlighted in this section.

An evaluation of the different approaches followed and it was mentioned that HCROI would be investigated in this research, in spite of the critique levelled at this measurement. The motivation behind this was the need for a benchmark for South Africa to compare outcomes both locally and internationally.

The section was closed off with a discussion of the essential issues of human capital measurement. The next point of discussion involves an in-depth consideration of the contribution of HCROI.

2.2 Human capital return-on-investment (HCROI)

2.2.1 Introduction

In the previous discussion, the importance of using HCROI was highlighted as information on it will enable a company not only to know what its contribution towards its human capital is per ‘dollar’ that the company contributes toward an employee, but will also be a force of attraction to investors if a company shows a good HCROI. According to the Saratoga⁵ (the world’s leading source for workforce measurement) 2008/2009 US Human Capital Effectiveness Report, a company spends *twenty-eight cents* (US\$0.28c) on average on workforce compensation and benefit costs to generate a dollar of revenue, which refers to HCROI. However, Saratoga 2010/2011 stipulates that HCROI went down to US\$0.43c in profit for every dollar invested in the workforce in the USA, which is higher than the previous year. There are many factors that may have contributed to the smaller profit for the company and it would be interesting to know whether it only had to do with the recently poor economic situation in America.

Successful companies even try to drive this number lower by aligning their workforce with business goals, and by using performance metrics as a guide during decision-making sessions. According to the same report (Saratoga, 2008a), there was either an improvement (↑) or a decline (↓) with regard to the following HR issues during 2007 (Table 2.1):

⁵“Saratoga is PwC’s human capital measurement and benchmarking business. It holds the world’s largest, most robust database of people performance metrics (the HR Index) from over 10,500 international organisations. With a more than 25-year track record in performance benchmarking, over 40% of Fortune 500 and FTSE 100 companies are regular Saratoga clients”(PricewaterhouseCoopers[©], 2011, p. 1).

The fundamental aim of PwC Saratoga is to assist organisations in quantifying and evaluating their human capital and its contribution to bottom-line profitability (© PricewaterhouseCoopers[©], 2011, p. 1).

Table 2.1

HR issues improving or declining during 2007

Workforce productivity	↑
Labour costs declining relative to revenue generated	↓
Labour cost per full-time equivalent (FTE)	↑
Voluntary turnover/high performer turnover (companies still having difficulty retaining youngest workers)	↓
Talent acquisition – offer acceptance rates	↓
Talent acquisition – first-year turnover (“war of talents” remains top priority)	↑

(Saratoga, 2008a)

The fact that the FTE increased suggests that there was more focus on lower cost employees during reorganisation efforts. According to the report there is little evidence that companies use more of their HR resources to talent-related functions (Saratoga, 2008a).

The top (fortunate) 500 companies (in the USA) have been measured (Schwab, 2009) to see what in those HR departments led to the success of the companies. The January 2010 Report (Schwab, 2009, p. 3) indicated that the HR systems cost per employee served declined by 32% to \$62 and HR labour cost per employee served declined by 16% to \$920. Increases were indicated in the following two areas: HR consultant and contractor per employee costs rose by 17% to \$124 and HR outsourcing cost per employee served rose by 7% to \$97.

Such figures are not available for South Africa and that is why this study was initiated and will add value to SA if figures for SA can be made available in order to benchmark it to the above. Then SA companies firstly will know how they compare with stronger developing markets and will also have a local benchmark against which to compare themselves.

This finalises the introduction and turns the focus on the next discussion, namely the anticipated topic of HCROI.

2.2.2 Defining human capital return-on-investment (HCROI)

HCROI is a financially based metric and comes from ROI and EVA (Economic Value Added). The purpose of *HCROI* is to look at return on investment with regard to monies spent on employee pay and benefits. When expenses are subtracted (but not pay and benefits), it produces an adjusted profit figure. When the adjusted profit figure is divided by human capital costs (pay and benefits), it produces the amount of profit derived for every dollar invested in human capital compensation (training, etc. excluded), in effect, the leverage on pay and benefits, which is expressed as a ratio. This helps managers to make more informed decisions and to know how well the company performs on its own and compared to others, and to know how to adapt the path of the company for the future with the strategic goals in mind.

Bontis (2001) proposed a conceptual model that explains that Human Capital Effectiveness is the depended component of the model (discussed in Section 2.2.4). He pointed out that the other antecedent constructs in the model are used to predict HC effectiveness. The construct has four measures, namely Revenue Factor, Expense Factor, Income Factor and Human Capital ROI. Bontis (2001) explains these factors as follows:

Table 2.2

Factors of the Human Capital Effectiveness model

Revenue Factor (Revenue / headcount)	Explains that the Revenue Factor metric is a basic measure of human capital effectiveness and is the aggregate result of all of the drivers of human capital management that influence employee behaviour. The Revenue Factor is calculated by taking the total revenue and dividing it by the total headcount of the organisation (Bontis, 2001, p. 4).
Expense Factor (Operating Expenses / headcount)	Says that the Expense Factor metric is calculated by taking the total operating expenses and dividing it by the total headcount of the organisation (Bontis, 2001, p. 5).
Income Factor (Profit / headcount)	The Income Factor metric is calculated by taking the total operating income and dividing it by the total headcount of the organisation (Bontis, 2001, p. 5).
HC ROI (Revenue – (Expenses – Compensation)) / Compensation	Lastly, Bontis (2001, p. 5) explains that Human Capital ROI calculates the return on investment on a company's employees. This is equivalent to calculating the value added by investing in the organisation's human assets.

(Bontis, 2001)

These are nearly the same elements as those in the formula that Fitz-enz (2010) submitted and which can be seen in the next example.

Measurement 1: Human Capital Return on Investment (HCROI)

Definition: HCROI can be explained as profits on monies spent on employee pay and benefit (Fitz-Enz, 2000). In other words, HCROI considers return on investment in terms of profit for funds spent on employee pay and benefits, in other words, how much would the company gain for every R1 paid to an employee (Economic Contribution of Human Resources).

Calculation of HCROI:

$$\text{HCROI} = \frac{\text{Revenue} - (\text{Expenses} - \text{Pay} + \text{Benefits})}{\text{Pay} + \text{Benefits (all labour classifications)}}$$

An example of the above definition can be explained as follows:

$$\text{HCROI} = \frac{\$100\,000\,000 \text{ [Revenue]} - (\$80\,000\,000 \text{ [Expenses]} - \$24\,000\,000 \text{ [Pay \& Benefits]})}{\$24\,000\,000 \text{ [Pay \& Benefits]}}$$

$$\text{HCROI} = \frac{\$44\,000\,000}{\$24\,000\,000}$$

$$\text{HCROI} = \$1.83$$

Thus, in the above scenario, the company would receive \$1.83 profit for every \$1 that has been invested towards an employee's compensation. There is a profit of .83c, which is favourable.

Two other measurements closely related to HCROI, namely *Human Capital Value Added (HCVA)*, *Human Economic Value Added (HEVA)*, will also be briefly mentioned. This specific point (Section 2.2.2) was introduced with the mentioning that HCROI is a financially based metric and comes from ROI and EVA (Economic Value Added).

Measurement 2: Human Capital Value Added (HCVA)

Definition: It can be described as the profitability per FTE (full-time equivalent) [profitability of the average employee] (Fitz-Enz, 2000). Stated differently, it means that it provides an indication of the

profitability per FTE as calculated by revenue, minus adjusted profit (operating expenses minus pay and benefits).

How to calculate HCVA:

$$\text{HCVA} = \frac{\text{Revenue} - (\text{Expenses} - \text{Pay and Benefits})}{\text{FTE's}}$$

All the corporate expenses must be subtracted, except pay and benefits. Then non-human expenses have to be taken out. If the adjusted profit is divided by the FTEs, the average profit per FTE is obtained.

For example:

$$\text{HCVA} = \frac{\$100\,000\,000 \text{ [Revenue]} - (\$80\,000\,000 \text{ [Expenses]} - \$24\,000\,000 \text{ [Pay \& Benefits]})}{500 \text{ [FTE's]}}$$

$$\text{HCVA} = \frac{\$44\,000\,000}{500}$$

$$\text{HCVA} = \$88\,000$$

If the cost of contingents, absence and turnover would be included, it would look like this:

For example:

$$\text{HCVA} = \frac{\$100\,000\,000 \text{ [Revenue]} - (\$80\,000\,000 \text{ [Expenses]} - \$31\,550\,000 \text{ [contingents, etc.]})}{500 \text{ [FTE's]}}$$

$$\text{HCVA} = \frac{\$100\,000\,000 - \$48\,450\,000}{600 \text{ (or } \$85\,917 \text{ per FTE)}} \quad [\text{the 600 includes employees and contingents}]$$

$$\text{HCVA} = \$51\,550\,000$$

Measurement 3: Human Economic Value Added (HEVA)

Definition: It can be described as the net operating profit after tax minus the cost of capital (Fitz-Enz, 2000). In other words, HEVA provides an indication of profit per FTE employee after expenses and capital.

Calculation of HEVA:

EVA (Economic Value Added) can be given a human capital perspective by dividing it by the FTE denominator. EVA should be converted into HEVA.

$$\text{HEVA} = \frac{\text{Net operating profit after tax} - \text{Cost of capital}}{\text{FTE's}}$$

For example:

Revenue	\$100 000 000
Expense	80 000 000
Payroll and benefits	24 000 000
Contingent costs	3 750 000
Absence cost	200 000
Turnover cost	3 600 000
Employees (FTEs)	500
Contingents (FTEs)	100

2.2.3 Components of HCROI

The elements that are used in the HCROI formula are revenue, expenses, and pay and benefits. The formula again, as presented by Fitz-enz (2000), is as follows:

$$\text{HCROI} = \frac{\text{Revenue} - (\text{Expenses} - \text{Pay} + \text{Benefits})}{\text{Pay} + \text{Benefits}(\text{all labour classifications})}$$

This concludes the contribution on defining HCROI and leads the way to the antecedents (a thing or event that existed before or logically precedes another) of HCROI.

2.2.4 Antecedents of human capital return-on-investment (HCROI)

It is important to refer to the valuable contribution of the Saratoga Institute (2008) concerning the financial data on Return on Investment and human capital that was made available. This is due to the work of Dr Jac Fitz-enz and others, like Dr Nick Bontis, which made this possible. In the study conducted in 2002, they submitted a model and measured the antecedents and consequents of effective human capital management.

The general quantitative antecedents of human capital entails that managements will continue to *invest* in human capital, while at the same time defending the organisation from human capital *depletion* (Bontis & Fitz-enz, 2002). Proxies of human capital investment and depletion respectively include the expenditures of turnover rates and training and development. The positive impact that human capital management has on effectiveness, leads to the outcome of human capital valuation. This outcome can be measured using revenue and profit per employee.

Another antecedent which is submitted by Edmondson (1996, in Bontis & Fitz-enz, 2002) argues that *leadership* is important for human capital development. This researcher claims that it is not enough for leaders to design appropriate organisational structures and continue to make well-reasoned decisions, but that organisations must have the characteristics of wanting to change conditions with a goal of a leading focus.

Yet another important antecedent in the development of human capital lies in *employee sentiment*. Employee sentiment is defined as the inter-relationship between employee satisfaction, commitment and motivation. This also relates to the organisation's overall culture. An organisation that has a culture of supporting and encourages cooperative innovation should try to understand what it is in that culture that gives them a competitive advantage. They should then try to develop and nurture that specific culture attribute (Bontis & Fitz-enz, 2002). The Conceptual Model developed by Bontis and Fitz-enz (2002) is depicted in Figure 2.2.

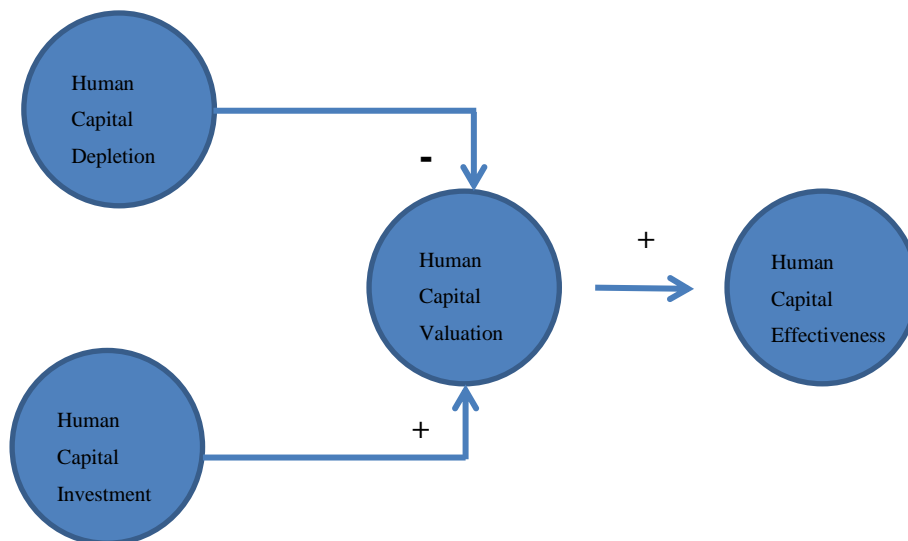


Figure 2.2. Conceptual Model. Intellectual capital ROI: A causal map of human capital antecedents and consequents by Bontis, N., & Fitz-enz, J., 2002. *Journal of Intellectual Capital*, 3(3), 228. Copyright 2002 by MCB UP Ltd.

Human Capital Effectiveness

According to the model in Figure 2.2, Human Capital Effectiveness is the dependent component of this model. The other three antecedent constructs predict Human Capital Effectiveness. It comprises four measures, namely the Revenue Factor, Expense Factor, Income Factor and Human Capital ROI (Bontis & Fitz-enz, 2002, p. 5). These researchers are of the opinion that the measurement of the *Revenue Factor* metric is a basic measure of human capital effectiveness. It is also the aggregate result of all the drivers of human capital management which influence employee behaviour. The way to calculate the Revenue Factor is by dividing total revenue by total headcount at the organisation (total revenue ÷ total headcount = Revenue Factor) as also mentioned by Bontis (2001) in the before-mentioned definition section of HCROI. A significant number of respondents have not provided the FTEs, as Saratoga Institute argues, and therefore the headcount measure was calculated instead. As can be expected, the headcount value is lower than the FTE measure and therefore an over-estimation can be expected, compared to the Saratoga sample (Bontis & Fitz-enz, 2002).

In other words human capital effectiveness is predicted by human capital depletion and investment, and human capital valuation. Human capital effectiveness also comprises the Revenue Factor, Expense Factor, Income Factor and HCROI. Furthermore, it seems that the total headcount vs. FTE makes a difference in the calculation, according to Bontis and Fitz-enz (2002).

The *Expense factor* metric, also mentioned above by Bontis (2001), is calculated by taking total operating expenses and dividing it by the total headcount of the organisation (total operating expenses ÷ total headcount = Expense Factor). The Saratoga Institute again wants the FTE to be calculated instead of the headcount. The *Income Factor* is calculated by dividing the total headcount of the organisation with the total operating income (total operating income ÷ total headcount = Income Factor). Human Capital ROI calculates the ROI on a company's employees: $HCROI = (\text{revenue} - (\text{expenses} - \text{compensation})) \div \text{compensation}$. This is the same as calculating the value added of investing in the organisation's human assets. The numerator in this metric is profit-adjusted for the cost of people (Bontis & Fitz-enz, 2002, p.5). What Bontis and Fitz-enz is saying is that the Saratoga Institute wants the FTE to be calculated instead of the headcount because the headcount includes all contract personnel while the FTEs only consider full-time employment, which will make a significant difference in the calculation's end result.

Human capital valuation

Human capital valuation is the mediating construct that predicts human capital effectiveness. The figures that are used in compensation are used to act as proxies for the value of human capital in organisations. It comprises five measures (Bontis & Fitz-enz, 2002, p.5), namely:

- *Compensation revenue factor* which describes how much was paid to employees as a percentage of sales. Over time, this will show whether the company obtained more or less return on every dollar invested in its people.
- *Compensation expense factor* which describes how much was paid to employees as a percentage of overall operating expenses. This measure shows the compensation cost structure of the organisation.
- *Compensation factor* – this metric measure the average compensation paid to each employee in the organisation. This measure is used by HR departments to determine the relative standing of salary levels within an industry.
- *Executive compensation factor* – this metric describes how much was paid on average to executives. Executives were defined as individuals at the VP level or higher.
- *Supervisory compensation factor metric* – this describes how much was paid on average to supervisors. Supervisors are defined as individuals at management and director level with supervisory roles but who are not VPs.

To put it differently, all the types of compensation that are mentioned above form part of human capital valuation, which predicts human capital effectiveness.

Human capital investment

The belief is that human capital investment has a positive influence on human capital management. The way organisations invest in human capital is primarily through training and development expenditures. Human capital investment also has three measures (Bontis & Fitz-enz, 2002, p.5), namely:

- The *development rate* describes how well an organisation provides access to training programmes for its employees. Organisations should design and provide their own training programmes to increase internal intellectual capital if the workforce talent pool becomes shallow.
- The *training investment metric* identifies the average dollar amount spent on training for each employee (trained or not). This figure can be compared against industry competitors.
- The *training cost factor* measures the average dollar amount spent on training for each employee *trained*. This figure should be higher than the training investment metric.

Investment in human capital therefore occurs primarily through training and development and an organisation that invests well in its human capital will have a positive influence on the management of its human capital.

Human capital depletion

There also is the belief that human capital depletion has a negative influence on human capital management. Organisations suffer from HC depletion through turnover. The reason for this is the loss of intellectual capital. Again, this construct comprises three measures (Bontis & Fitz-enz, 2002, p.5), namely:

- *Voluntary turnover* describes the percentage of individuals who leave the organisation by choice. The measure has a negative impact on HC management because it demonstrates an employee vote for leaving an organisation due to possible better circumstances elsewhere.
- *Involuntary turnover* again describes the percentage of individuals who were terminated without choice. This category comprises all who were dismissed, laid off, became disabled or died. Poor hiring practices may be a cause, but it is mostly due to economic conditions.
- *Total separation rate* describes the percentage individuals who were terminated without choice, but also individuals who left of their own accord. This measure is a combination of the two previous metrics and represents the whole rate of human capital depletion regardless of reason.

In other words, if an organisation has a high turnover, it has a negative influence on the management of its human capital, because the company loses intellectual capital. Companies invest in human capital with training and development, just to lose the individual again, and all the time and effort incurred is lost. This becomes a vicious cycle if the turnover is too high.

This ends our discussion on the antecedents found for human capital return on investment. That managers will continue to invest in human capital through training and development, but will defend the organisation against depletion of human capital because it represents a loss in human capital, has been discussed. Furthermore, leadership was discussed as important for human capital development and employee sentiments. This was followed by a discussion on the components of the conceptual model developed by Bontis and Fitz-enz (2002) in which human capital effectiveness, valuation, investment and depletion, which complement the initial antecedents, were discussed in more detail.

The next point under discussion will be international comparative levels of HCROI. Information was available for individual countries, but not for individual continents, except for the USA.

2.2.5 *International comparative levels of HCROI*

Information from The Saratoga Institute, a PricewaterhouseCoopers (PwC) Human Resources Services Offering, is used in this research since the institute is a global leader in Human Capital Management. It provides a unique and comprehensive approach that can be studied through its Workforce Diagnostic System. If the Saratoga approach is used, companies can track and benchmark the cost of recruiting, hiring and turnover of employees. Most importantly, though, it can track and benchmark the ROI of human capital (Saratoga Institute website, 2011). Furthermore, their human capital measurement and benchmarking capability is globally recognised. PwC's Saratoga Institute works with 40% of FTSE 100 and Fortune 500 companies. The Saratoga Institute believes that intelligent measurement is fundamental to performance improvement.

Furthermore, the Saratoga Institute works from the World Bank's classification of economies, which divides the world into six regions, namely East Asia and the Pacific, Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, South Asia, and Sub-Saharan Africa. Furthermore Saratoga refers to two income groups, namely a "high-income OECD" and "other high income" (Schwab 2009, p. 63).

Table 2.3 reports the mean HCROI ratio for companies across sectors in European companies. Table 2.4 reports mean HCROI values per country, after which a short general discussion will follow on information of the USA, South America, Europe and Africa.

Table 2.3

European medians by sector 2008/9 – core productivity measures

Human capital ROI (€)	
Industry sector	
Banking	1.69
Other finance	1.19
Insurance	1.84
Comms/media	1.17
Technology	1.11
Pharma	1.31
Chemicals	1.42
Eng/Mfg	1.18
Utilities	1.35
Retail & leisure	1.15
Services	1.14
Public sector	n/a

Source: PwC Saratoga database

(Phelps (2010, p. 7)

Table 2.4

Human capital ROI trend 2004/5 – 2008/9

Country	2004/5	2005/6	2006/7	2007/8	2008/9	% change	% change
						2006/7-2008/9	2007/8-2008/9
UK	1.11	1.13	1.13	1.14	1.11	-2.1%	-2.8%
CEE Europe	1.11	1.23	1.25	1.22	1.57	25.4%	28.6%
Western Europe	1.14	1.16	1.17	1.18	1.16	-0.9%	-1.7%
All Europe	1.14	1.16	1.17	1.20	1.16	-0.6%	-2.6%
US	1.52	1.36	1.57	1.53	1.53	-2.5%	0.0%

Source: PwC Saratoga database

(Phelps, 2010, p. 7)

2.2.5.1 USA

The United States lost their secured place under the leaders and now fills the 4th position. While the USA is extremely productive in some features, many escalating weaknesses led to its lowered ranking over the past two years. The US university system is based on an excellent system and collaborates strongly with the US business sector in R&D (Research and Development). This may be the reason why US companies are highly sophisticated and innovative. The US has the largest domestic economy size in the world and these qualities still makes the US very competitive. The US labour market is ranked 4th. Furthermore the US is characterized by an ease and affordability of hiring workers, and having significant wage flexibility (Schwab, 2010).

2.2.5.2 South America

In this section South America should have been discussed, but since there is not information available for this specific region, Latin America and the Caribbean will be discussed instead as mentioned in the Saratoga reports.

Latin America and the Caribbean

Several countries within Latin America and the Caribbean have shown progress in improving and reinforcing their competitiveness fundamentals – in spite of the recent severe global economic downturn. Bolivia, Panama, and Paraguay posted the largest improvements, while the economies of Brazil, Chile, Costa Rica, and Uruguay improved slightly or remain stable. This is an indication of the important strides towards sounder fiscal management, as well as increased market efficiency and openness this region has made recently. These countries also succeeded in reducing debt levels, coupled with increased foreign reserves. This reinforces their resilience and ability to support their economy. In 2009 the regional GDP contracted by 1.8% but it is again expected to grow by 2010 (Schwab 2010).

When compared with the rest of the world (Schwab 2010, p. 31),

the region must improve significantly in order to catch up with international best practices and fully leverage its competitiveness potential. Only Chile (30th) and the two small Caribbean islands of Puerto Rico (41st) and Barbados (43rd) feature within the top 50 most competitive economies in the world. Panama (53rd), Costa Rica (56th), Brazil (58th), and Uruguay (64th) are also included among the top half of the rankings, together with Mexico (66th), Colombia (68th), and Peru (73rd). Also a large number of

regional economies continue to appear in the bottom part of the rankings, trailing behind most of the world in competitiveness—these include Ecuador (105th), Bolivia (108th), Nicaragua (112th), Paraguay (120th), and Venezuela (122nd).

2.2.5.3 Europe

European countries have also been hit particularly hard by the global economic crises. This led to rising unemployment, plunging demand as well as in some cases a concern about the sustainability of sovereign debt. In spite of this, Europe continues to feature prominently among the most competitive regions in the world. There are six European countries among the top 10, and twelve among the top 20. They are: Switzerland (1st), Sweden (2nd), Germany (5th), Finland (7th), the Netherlands (8th), Denmark (9th), the United Kingdom (12th), Norway (14th), France (15th), Austria (18th), Belgium (19th), and Luxembourg (20th) (Schwab, 2010).

2.2.5.4 Africa

Also, for this region no information could be found, but the following is mentioned about Sub-Saharan Africa:

Sub-Saharan Africa

Over the past decade Africa has experienced impressive growth, and as such could weather the recent global economic turmoil relatively well. The IMF predicted a GDP growth of 4.7% for 2010 as well as for the next few years. However, questions are raised about how sustainable this growth will be over the longer term about the competitiveness of African economies. Areas in need of urgent attention have been highlighted to allow Africa to achieve its full economic potential.

Although there are concerns, there are some African countries who continue to fare well like South Africa and Mauritius, who remain in the top half of the rankings. However, sub-Saharan Africa as a whole lags behind the rest of the world in competitiveness (Schwab, 2010).

South Africa

In terms of competitiveness South Africa ranks 90th. In The Global Competitiveness Index 2009-2010 Report, South Africa ranks 45th out of the 133 countries, but regarding Labour Market Efficiency, South

Africa only ranks 90th (Schwab, 2009). In the 2010-2011 report, SA unfortunately dropped to 97th place. This paints a bleak picture compared with the United States which is ranked 3rd. Interestingly enough, Singapore (which one would assume not to rank under the top companies) is ranked first with regard to Labour Market Efficiency. With regards to productivity levels per person employed, productivity in Sub-Saharan Africa (where South Africa resorts) is one-twelfth of that of a worker in the industrialised countries like the USA, where the labour productivity level is US\$35.63 (ILO Press Release, 2007, p. 1). During the financial year of 2008/2009, USA companies spent twenty-eight cents (US\$0.28c) on average on workforce compensation and benefit costs to generate one dollar of revenue.

South Africa remains the highest ranked country in sub-Saharan Africa with its ranking of 54th. Although it dropped somewhat in rank from 2009, its performance has remained stable. This decline for South Africa reflects improvements in other countries. Furthermore, South Africa still benefits from the large size of its economy. This is particularly by regional standards (ranked 25th in the market size pillar).

It also does well on measures of the quality of institutions and factor allocation, such as intellectual property protection (27th), property rights (29th), the accountability of private institutions (3rd), and goods market efficiency (40th). Particularly impressive is the country's financial market development (ranked 9th), indicating high confidence in South Africa's financial markets at a time when trust has been eroded in many other parts of the world. South Africa also does reasonably well in more complex areas such as business sophistication (38th) and innovation (44th), benefiting from good scientific research institutions (ranked 29th) and strong collaboration between universities and the business sector in innovation (ranked 24th). (Schwab, 2010, p. 39)

A number of attributes make South Africa the most competitive economy in the region. In order to further enhance its competitiveness it will need to address some weaknesses. The country ranks 97th in labour market efficiency. It has inflexible hiring and firing practices (135th), a lack of flexibility in wage determination by companies (131st), as well as poor labour-employer relations (132nd). Furthermore, efforts should be made to increase the university enrolment rate of only 15%. This places the country 99th overall. Also, South Africa's infrastructure requires upgrading (ranked 63rd) beyond what has been achieved in the preparations for the 2010 World Cup. An important obstacle to doing business in South Africa is the poor security situation which remains a concern.

The business costs of crime and violence (137th) and the sense that the police are unable to provide protection from crime (104th) do not contribute to an environment that fosters

competitiveness. Another major concern remains the health of the workforce, ranked 127th out of 139 countries, the result of high rates of communicable diseases and poor health indicators more generally. Improvements in these areas will enhance South Africa's productivity and competitiveness. (Schwab, 2010, p. 40)

From the above it is noticeable that Africa still has a long way to go regarding competitiveness if compared to the USA, Europe and even Latin America. Although South Africa ranks better than some other African countries, it should still develop in the area of labour market efficiency and should also address issues that are pulling it down as discussed in the above paragraphs in order to improve its overall ranking.

From the Saratoga reports on HCROI listed earlier, it is apparent that no African country is contained in their survey, hence, leading to questions about the degree to which South African companies compete against these published standards.

2.2.6 The need for a SA benchmark for human capital effectiveness (HCROI)

Benchmarks are thoroughly discussed in Section 1.1.5, and Fitz-enz (1992) was mentioned as saying that benchmarking is a point of reference when researchers measure where the result can be used as a standard against which to measure other values. The Saratoga reports (2008b) points out that companies can apply the benefits of benchmarking on different levels, namely internally with comparative performance, trends over time, competitors, cross-sectorally (seeking best practice across sectors) and internationally, which goes across regional, multi-national, and global organisations.

Phillips (2007) makes his contribution by naming six types of data that the ROI process collects which can be of use to HR managers or practitioners to fulfil their role, namely (p. 3):

- Reaction and Planned Action
- Learning and Confidence
- Application and Implementation
- Business Impact
- Return on investment
- Intangible benefits.

The advantages of having SA benchmarks in HCROI values are highlighted in the above discussion and it is believed that companies may welcome this research and would include this as a standard corporate

financial reporting practice in their Annual Company Reports. Further, it is hoped that human capital reporting of this nature would become standard practice in sound corporate governance.

2.2.7 *Descriptive hypothesis*

Every empirical research project proceeds from a hypothesis or from more than one. A hypothesis can be described as a theory or an assumption. Kerlinger (1992, p. 11) defines it as follows: “A hypothesis is a conjectural statement, a tentative proposition about the relation between two or more phenomena or variables. Our scientist will say, ‘If such-and-such occurs, then so-and-so results.’ Hypotheses carry clear implications for testing the stated relations.” With this, Kerlinger says a hypothesis is a statement about the relationship between two (or more) phenomena or variables. Furthermore, if something occurs in one it will have an effect on the other. The same researcher also suggested the order to be followed in formulating a hypothesis (p. 17): “After intellectualizing the problem after turning back on experience for possible solution, after observing relevant phenomena, the scientist may formulate a hypothesis.” Therefore one can say that a hypothesis is formulated after the problem has been considered and a possible solution has been sought from earlier experience.

The extent to which descriptive research succeeds in answering the research-initiating question, depends on the detail and clarity with which a theoretical hypothesis about the nature of the status quo that the research aims to describe, and the nature and extent to which the existing response is expected to deviate from an ideal reaction, is formulated. The current situation is that no (official) HCROI industry benchmark values are available in South Africa. South Africa, as mentioned, furthermore has a low productivity level measured against developed countries.

Regarding the dimension of *time*, the expectation is that HCROI values will become more popular amongst management and HR professionals for making better decisions about strategic issues. In addition, it is expected that, once they become aware of the value of benchmarking in South Africa, more and more companies would want to calculate their HCROI in order to determine how their company compares with others locally and internationally. Managers may want to incorporate this benchmark value in the Annual Report as part of the performance of the company to attract investors. Managers would also be able to see the bigger picture of how productive their human capital is compared to others and would be able to devote themselves to improvement if a handicap exists, or could build on maintaining and improving the competitive edge.

The level of HCROI for many SA companies listed on the JSE would be low, due to the low productivity levels in SA, as evidenced in the low productivity rating for SA as indicated in the World Competitiveness Report (Schwab, 2010). According to the *Labour market efficiency* index of the same report, SA only ranks 90th out of the 134 countries; this is extremely poor. SA is listed lowest of the BRIC countries regarding its labour market efficiency and can be compared with countries like Mozambique, Spain, Portugal and Zambia. Even Namibia is seen to be more labour market efficient with its ranking of 57th. The 2010/2011 Report indicates that labour market efficiency in SA has even worsened to a ranking of 97th. Singapore is the best performing country in the labour market efficiency group in this year's Report (2010/2011).

Although this research is not diagnostic in nature, a brief description of diagnostic hypotheses is offered as conclusion of this section:

Diagnostic Hypotheses: One could envisage an ideal situation for a HCROI for South African JSE listed companies that is more or less the same as the USA — a country with an admirable degree of labour competitiveness — HCROI value of \$0.28c (2010 value) per employee for every dollar spent per employee. This mean level of HCROI would denote a productive and effective work force. It would also include a competitive wage scale which would include the financial security of companies. In addition, it would include a higher-skilled work force.

2.2.8 Summary and conclusions

This chapter focused on a discussion of Human Capital Return-on-Investment (HCROI). HCROI was defined and its components were identified. This was followed by a discussion of the antecedents of HCROI. Then attention was given to comparative views of the USA, Latin America, Europe and Africa, of which SA is a part. The need for a SA benchmark was discussed and advantages of benchmarking that would be to SA's benefit were highlighted. The final discussion focused on the descriptive hypothesis. The next chapter focuses on the research method that was used in this study.

CHAPTER THREE

METHOD

3.1 Introduction

This study was initiated by a lack of an industry benchmark of human capital effectiveness for South African companies. One of the means to measure the effectiveness of human resources is through the calculation of human capital return on investment (HCROI). Companies listed on the Johannesburg Stock Exchange were sampled to calculate their HCROI ratios, and thereby, establish a public-domain benchmark not only for local companies, but also to allow for comparison with international trends.

With this aim in mind, the research method used in this study will be discussed in Chapter 3. After this short introduction, the research problem and research hypotheses are proposed. Then, the sampling that was chosen for this study is described, followed by a discussion of the research design. Consequently the measurement of HCROI in this study is discussed, data collection, and finally, the statistical analysis of research data.

A more detailed account of the research method used in the present research will subsequently be presented, starting with proposing the research problem and hypothesis.

3.2 Research problem

Against the backdrop of literature review in Chapter 2, the research problem addressed by the present study is a lack of local industry benchmarks for human capital effectiveness, as expressed by indices of human capital return on investment (HCROI), for South African companies listed on the JSE. The research initiating question for this study therefore is:

Broadly posed, how do companies differ in their ability to leverage profits from expenditure on human capital? Stated otherwise, what is the level of human capital effectiveness — expressed as a ratio of Human Capital Return on Investment (HCROI) — for South African Companies listed on the JSE?

South Africa does not have a benchmark where local companies compare their HC effectiveness with the leading companies locally and internationally. Describing HC effectiveness will only be useful to the extent to which users of benchmarks can compare themselves against others, categorised by characteristics such as size, sector, year, etc. Following from the research initiating question, the following research question is derived:

How does HCROI vary across JSE listed companies, when compared across company size categories, industry and time?

Now that the research problem was proposed, the research design for this study will be discussed next.

3.3 Research design

In order to understand what is meant by a research design, the following two comprehensive definitions will be used, starting with the one of Kerlinger (1986, p. 279, cited in Kumar, 2005):

A research design is a plan, structure and strategy of investigation so conceived as to obtain answers to research questions or problems. The plan is the complete scheme of program of the research. It includes an outline of what the investigator will do from writing the hypotheses and their operational implications to the final analysis of data.

The second definition used by Kumar (2005), is the one of Thyser (1993, p. 94, in Kumar, 2005):

A traditional *research design* is a blueprint or detailed plan for how a research study is to be completed – operationalizing variables so they can be measured, selecting a sample of interest to study, collecting data to be used as a basis for testing hypotheses, and analysing the results.

Given the research aims outlined above, the present descriptive study is empirical in nature and uses secondary research data in a retrospective fashion. Since it is a descriptive study, a non-experimental cross-sectional survey research design was used. Survey research can be defined as: “Survey research studies large and small populations (or universes) by selecting and studying samples chosen from the population to discover the relative incidence, distribution, and interrelations of sociological and psychological variables.” (Kerlinger & Lee, 2000, p. 599). In other words, by studying large population

samples through survey research one is able to discover the incidence, distribution and interrelations of variables, which makes survey research a suitable research design for the present study.

The research aims to evaluate the broad descriptive hypothesis with regards to the levels of human capital effectiveness of JSE listed SA companies, by comparing the central tendency and dispersion of HCROI ratios of listed companies across various industry sectors, company size, and economic cycle (years). Last, a broad comparison of the SA mean HCROI with those from international peers will be made.

Because of the *ex post facto* (having a retrospective effect) nature of the research design, causal inferences may not be drawn from research results. The researcher has no direct control of independent variables since its manifestations would already have occurred. No experimental manipulation of the determinants was possible.

In the next discussion, the sample that was decided upon will be discussed. The topic was divided between the size of the sample, and the sectors included on the research.

3.4 Sample

In order to provide a better understanding of what is meant by sampling, the definitions of target- and sampling population will be given, as well as what is meant by a sample frame: The *target population* refers to the theoretical totality of elements implied by the research initiating question (Babbie & Mouton, 2007). Castillo (2009) defines it in a simple manner by saying that the target population is the entire group in which the researcher is interested to generalise the conclusions to. The target population for this research is South African listed companies. Since it would be difficult to access information of all companies in SA, it was decided to narrow the sampling frame down to only JSE listed companies.

The *sampling population* (or study population) refers to the population of elements from which a sample of elements is actually selected (Babbie & Mouton, 2007). Kerlinger (1992) again describes it as any portion of a population that can be representative of the population. In this research, the companies listed on the JSE were used as the sampling population which can be representative of all the South African companies.

The listing of elements in the sampling population is known as the *sampling frame* (Babbie & Mouton, 2007). In the case of this research it is the JSE listed companies that is available on the *McGregor BFA (MGBFA)*(2010) webpage.

A sample will be considered representative to the extent to which it provides (through statistics) an accurate portrayal of the characteristics of the sampling population (expressed i.t.o. parameters) (Babbie & Mouton, 2007). This is also confirmed by Kerlinger (1992), when stating that the term ‘representative’ means that it is typical of a population, in other words to exemplify the characteristics of the population.

Furthermore, two types of sampling procedures are distinguished by Babbie en Mouton (2007), namely *probability sampling* procedures in which each element in the sampling population has a known, positive probability of being selected into the sample, and *non-probability sampling* procedures in which the probability of selection is unknown for each element of the sampling population. The present study attempts to sample the full population ($N = 316$) of publicly listed companies on the JSE, using the *McGregor BFA* (2010) database. Due to the nature of the sampling procedure it is expected that the research results would generalise to the total study population.

Next, the sample characteristics will be described by size and sector. Size and sector will be discussed separately in order to highlight each one as part of its place in the sampling process.

3.4.1 *Size*

Frequency table 3.1 shows that small companies comprised 68 % of all the companies and large companies comprised the smallest percentage (12.5 %). Medium companies comprised nearly 19 % ($n = 60$). In the attached appendices (A – C) the listed companies per size can be viewed. The discrepancy in the size listed below ($N = 319$) for the small companies, and the list attached in the appendix, results from the fact that the company list in the appendix was copied from the *ShareData Online* (2011), whereas the table below lists the companies included in the *MGBFA* (2010) registry. The information in Table 3.1 is depicted graphically in Figure 3.1 below.

Table 3.1

Frequency table for small, medium and large companies (N = 319) in sample

		Proportion P			
	Size	<i>f</i>	<i>P</i>	Valid <i>P</i>	<i>CUM-P</i>
Valid	Large	40	12.5	12.5	12.5
	Medium	60	18.8	18.8	31.3
	Small	219	68.7	68.7	100.0
	Total	319	100.0	100.0	

Appendices A, B and C were included which list every company in each size group. The reason for adding this was that if a company wants to benchmark, it can firstly look up in which size category it falls, and secondly, in which size group its competitor falls, and can then use the respective benchmark value.

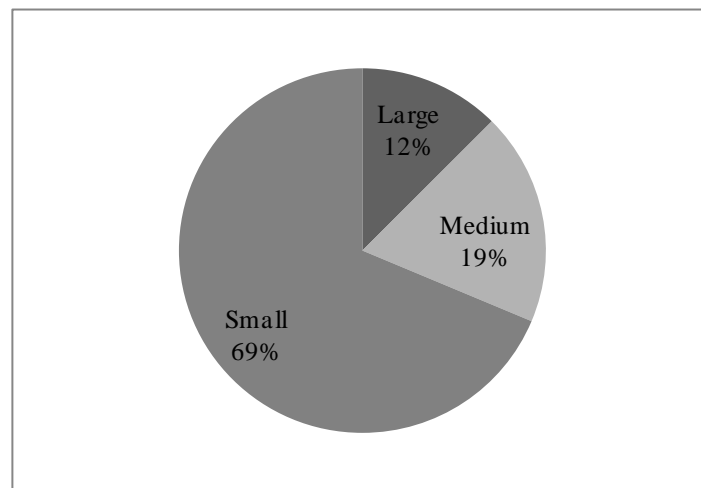


Figure 3.1. Pie chart indicating the percentages of company sizes in sample ($N = 319$)

3.4.2 Sectors

In order to describe the sample of all companies by sector, frequency tables were compiled. Table 3.2 reports the frequencies of companies ($N = 319$) by sector (sectors $N = 42$) as categorised by *ShareData Online* (2011).

Table 3.2

Frequencies of companies in each sector as per ShareData Online (2011) ($N = 42$)

SECTOR	Indicator
AltX - AltX	1
Automobiles & Parts - Automobiles & Parts	2
Banks - Banks	3
Basic Resources - Forestry & Paper	4
Basic Resources - Industrial Metals & Mining	5
Basic Resources - Mining	6
Chemicals - Chemicals	7
Construction & Materials - Construction & Materials	8
Debt - Corporate Debt	9
Debt - Preference Shares	10
Development Capital - Development Capital	11
Financial Services - Financial Services	12
Food & Beverage - Beverages	13
Food & Beverage - Food Producers	14
Health Care - Health Care Equipment & Services	15
Health Care - Pharmaceuticals & Biotechnology	16
Industrial Goods & Services - Electronic & Electrical Equipment	17
Industrial Goods & Services - General Industrials	18

SECTOR	Indicator
Industrial Goods & Services - Industrial Engineering	19
Industrial Goods & Services - Industrial Transportation	20
Industrial Goods & Services - Support Services	21
Insurance - Life Insurance	22
Insurance - Nonlife Insurance	23
Investment Instruments - Equity Investment Instruments	24
JSE Africa - JSE Africa	25
Media - Media	26
Oil & Gas - Oil & Gas Producers	27
Other - Other Securities	28
Personal & Household Goods - Household Goods & Home Construction	29
Personal & Household Goods - Leisure Goods	30
Personal & Household Goods - Personal Goods	31
Personal & Household Goods - Tobacco	32
Real Estate - Real Estate Investment & Services	33
Real Estate - Real Estate Investment Trusts	34
Retail - Food & Drug Retailers	35
Retail - General Retailers	36
Technology - Software & Computer Services	37
Technology - Technology Hardware & Equipment	38
Telecommunications - Fixed Line Telecommunications	39
Telecommunications - Mobile Telecommunications	40
Travel & Leisure - Travel & Leisure	41
Venture Capital - Venture Capital	42

However, in the table below, it is evident that not all sectors had companies listed according to the *MGBFA* listings. There are two sectors without company listings. These sectors without company listings were: Debt – Corporate Debt and Preference Shares, Development Capital, JSE Africa and Venture Capital.

Table 3.3

List of sectors indicating the number of companies listed in the different size groups

		Sector * Size Crosstabulation			Total
		Large	Medium	Small	
Sector	AltX	0	0	2	2
	Automobiles & Parts	0	0	2	2
	Banks	5	1	2	8
	Basic Resource-Forestry&Paper	0	3	1	4
	Basic Resource-Ind Metal&Mining	2	1	6	9
	Basic Resource-Mining	10	5	39	54
	Chemicals	0	2	4	6
	Construction&Materials	0	4	16	20
	Financial Services	2	2	16	20
	Food&Beverage-Beverages	1	1	2	4
	Food&Beverage-Food Producers	1	4	9	14
	Health Care-Equipment&Services	0	3	1	4
	Health Care-Pharmaceutical&Biotechnol	1	1	2	4
	Ind Goods&Services-Electronic&Electr Equip	0	2	7	9
	Ind Goods&Services-General Industrials	1	2	7	10
	Ind Goods&Services-Industr Engineering	0	0	5	5
	Ind Goods&Services-Industr Transport	0	3	4	7
	Ind Goods&Services-Support Services	1	0	17	18
	Insurance-Life Insurance	3	2	1	6

Sector * Size Crosstabulation

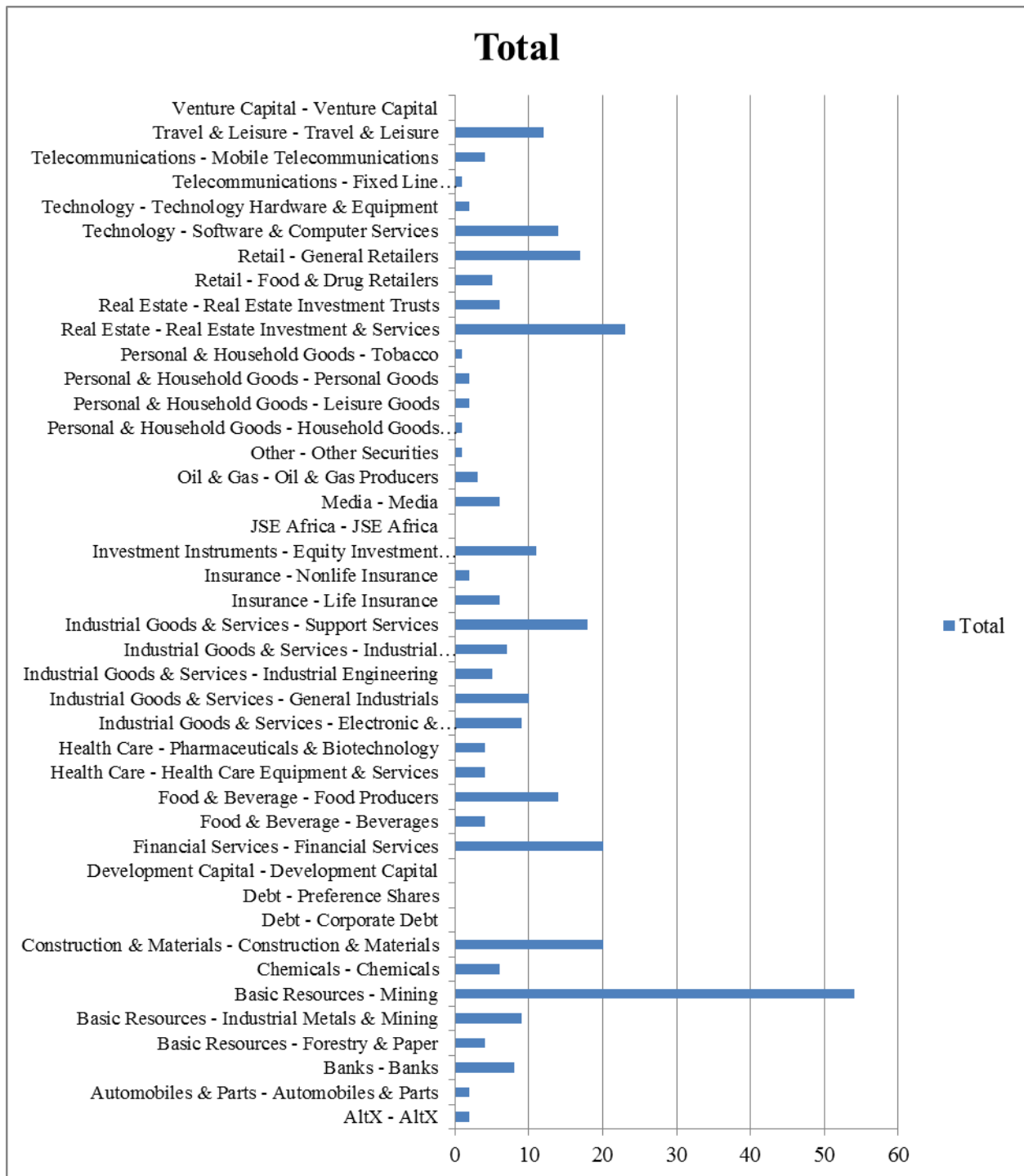
	Size			Total
	Large	Medium	Small	
Insurance-Nonlife Insurance	0	1	1	2
Investm Instruments-Equity Investm Instruments	1	2	8	11
Media	1	1	4	6
Oil&Gas Producers	1	0	2	3
Other-Other Securities	0	0	1	1
Personal&Household Goods-Household Goods&Home Construct	1	0	0	1
Personal&Household Goods-Leisure Goods	0	0	2	2
Personal&Household Goods-Personal Goods	1	0	1	2
Personal&Household Goods-Tabacco	1	0	0	1
Real Estate-Investment Trusts	1	3	2	6
Real Estate-Investment&Services	1	4	18	23
Retail-Food&Drug Retailers	1	4	0	5
Retail-General Retailers	2	4	11	17
Technology-Software&Computer Services	0	1	13	14
Technology-Technology Hardware&Equipment	0	0	2	2
Telecommunications-Fixed Line	0	1	0	1
Telecommunications-Mobile	2	1	1	4
Travel&Leisure	0	2	10	12
Total	40 [†]	60	219	319

Note. Sectors: $N = 42$, Companies: $N = 319$

[†] Two sectors had no company listings

The *Basic Resource - Mining* sector is the largest according to the *MGBFA* (2010) listings (Large: $n = 10$, Medium: $n = 5$, Small; $n = 39$, Total: $N = 54$). From Appendix A, it is clear that the basic mining sector comprises 16.9 % of all the companies (Large: $n = 25$ %, Medium: $n = 8.3$ %, Small: $n = 24.6$ %). This sector also has the most large, medium and small company listings (Large: $n = 10$, Medium: $n = 5$, Small; $n = 39$). Sector *Real Estate Investment & Services* is the second largest ($n = 23$) which comprises 7.2 % of all companies (of which 18 falls in the small category = 8.2 %). Four sectors indicate only one company listing each.

Furthermore, to compare the sector sizes graphically a bar graph (Figure 3.2) was compiled. The sectors that appear to be the largest are Basic Resources – Mining, Real Estate – Investment and Services, Financial Services, Construction & Materials, followed closely with Industrial Goods and Services – Support Services.



Note. Listed alphabetically from bottom to top

Figure 3.2. Bar graph indicating the frequency of companies per sector.

This concludes the discussion on the research sample and sampling strategy. Next, the measurement used in this research will be discussed.

3.5 Measurement

The present research utilises objective secondary research data sourced from *McGregor BFA* (2010) financial data base to compile ratios of human capital return-on-investment (HCROI) for each company, as indicators of human capital effectiveness.

The *McGregor BFA* (2010) database represents the audited financial statements of JSE listed companies. In order to calculate the HCROI for each company, the following specific values presented in the formulation below were extracted manually from source codes that are assigned to each financial statement value:

$$\text{HCROI} = \frac{\text{Revenue} - (\text{Expenses} - \text{Pay and Benefits})}{\text{Pay and Benefits (all labour classifications)}}$$

Where:

HCROI = human capital return on investment

Revenue = total annual revenue

Expenses = total annual expenses

Pay & Benefits = total annual pay and benefits costs

In order to provide a meaningful benchmark of levels of human capital effectiveness in South Africa, the resultant HCROI-values will later be compared across the following characteristics that are also extracted from the *McGregor BFA* (2010) database:

a) Size of the company: The sizes of the companies have also been categorized, namely large size companies ($n = 40$) was categorized as nr 1, medium companies ($n = 60$) as nr 2 and small companies ($n = 219$) as nr 3.

b) Sector in which the company resorts: The sectors have be coded, for example:

Banks

3

Basic Resources – Mining 6

There are 42 sectors.

Companies varied in their use of base currency in their annual financial reporting. All currencies were converted into South African Rand (ZAR) as most companies use this currency. This conversion was made using standardised monthly average Rand cross-exchange rates with each respective currency.

3.6 Data collection

The values required for the calculation of HCROI were drawn from the *McGregor BFA (2010)* database. The following specific values were copied from the *McGregor BFA (2010)* website to an Excel file: turnover, cost of sales, total income, profit after tax and interest, director's emoluments, and lastly staff costs (excluding director's emoluments) which will be listed below. There are 316 companies listed on the JSE list provided by *McGregor BFA (2010)* – not all of them South African.

In the *McGregor BFA (2010)* website, the following source codes were extracted to use as data on key variables:

- 060 – Turnover
- 053 – Cost of Sales
- 095 – Total Income
- 090 – Directors Emoluments
- 100 – Profit After Interest and Tax
- 345 – Staff Costs (excluding directors remuneration)

The mentioned website gave the following explanations for the different values mentioned above in order for the right value to be plotted in its specific position in the HCROI formulation:

- Line 02020060: *Turnover*
This figure represents the total turnover for the year (or period) under review as reflected in the annual financial statements. (It may sometimes be reflected as "Revenue")
- Line 02020061: % Change in Turnover
The variation in turnover is automatically calculated.

- Line 02020053: *Cost of Sales*

This figure represents the total cost of the turnover for the year (or period) to the Company or Group.

- Line 02020095: *Total Income*

This line contains the total income for the period. (The figure is calculated as follows: Lines 02020062 + 02020063 + 02020064).

(where all lines are explained in a detailed description of all line items with cross references in *McGregor BFA* (2010, p. 31) as follows:

Line 02020062: Investment Income

It represents the income (dividends) received from all listed and unlisted investments.

Line 02020063: Operating Income

This is the operating profit before tax, as disclosed in the annual income statement, before accounting for investment income and interest received/paid. To this amount, add/subtract any income/expense amounts which the company shows separately in the annual income statement or accompanying notes, as well as any abnormal items shown before tax. If goodwill written off is included in operating profit, it is added back on this line and shown on line 02020076. Therefore this amount can be different from the operating income shown in the annual income statement.

Line 02020064: Interest Received

It represents the total interest received, i.e. interest received on all long-term and short-term loans advanced, as well as interest received on debentures, "notes" and "bonds".)

The values that were used for processing the formulation are therefore as follows:

$$\text{HCROI} = \frac{\text{Revenue} - (\text{Expenses} - \text{Pay and Benefits})}{\text{Pay and Benefits (all labour classifications)}}$$

- Revenue: value 060: Turnover
- Expenses: value 053: Cost of Sales
- Pay and Benefits: 090: Directors Emoluments + 345: Staff Costs (excluding directors remuneration)

Now that it was indicated where and how the data will be obtained and be collected, the data preparation will be discussed in the next section.

3.7 Data Preparation

In order to analyse the research data for the present study, data were prepared to make these suitable for calculating measures of central tendency and dispersion. The procedure that was followed to source and prepare research data for this descriptive study was as follows:

- a) Audited financial information from each company's published financial income statement were recalled from the *McGregor's BFA* web page, as described in Chapter 3. The values of turnover, cost of sales, total income, profit after interest and tax, director's emoluments, and staff costs for the years 2006 to 2010 were extracted and copied to an Excel spreadsheet. Because so few companies had information listed for 2011 at the time of data collection, it was decided to ignore this year overall. Many companies presented no information for the years 2006 to 2008, but most had information for 2009 and 2010.
- b) Captured data were cross-checked to make sure that export and capturing errors did not occur.
- c) All the commas were deleted from the exported values as indicators of thousands (e.g., '000).
- d) Following this, the sector and the size variable information of each company were drawn from *ShareData* (2011) and merged with the *McGregor's BFA* information, as mentioned before.
- e) The names of the companies were deleted from the data set to maintain the anonymity of each company.
- f) All values were converted to a common currency, namely South African Rand (ZAR), using the average monthly cross-exchange rate for each currency unit within each year, in order to discount monthly fluctuations in currency values. Three companies were deleted in this process because their information represented two or more different currencies for the relevant years.
- g) As a final step, the SPSS data set was further specified as necessary.

The last topic in this chapter will discuss the statistical analysis used in this research.

3.8 Statistical analysis

Statistical analysis provides a way to quantify the confidence researchers can have in their inferences (Rositter, 2006). Statistical analysis in research is used because data should be summarised in a form that enables an investigation of the research problem.

After the required data values were sourced from the *McGregor BFA* (2010) database, all information that can be used to identify participant companies were hid in order to protect the identity of each company. After data cleaning, the database was exported to SPSS for analyses. Samples were drawn to make sure that the data copied from *McGregor BFA* (2010) was without error. Furthermore, samples have also been drawn of the currencies that were converted in order to make sure the data was accurate.

The HCROI ratios were subsequently calculated for each company in the total sample. In order to calculate the HCROI for each company, the following values were firstly copied from the *MBFA* webpage to an Excel file: turnover, cost of sales, total income, profit after tax and interest, director's emoluments, and lastly staff costs (excluding director's emoluments). Prior to calculating HCROI for each company, all values were transformed to a single currency (ZAR). The HCROI ratio for each company was calculated by means of a linear transformation using SPSS TRANSFORM COMPUTE using the formula from Fitz-enz (2010) as stated previously.

Since a variety of factors could have both a direct and indirect determining influence on HCROI. These factors play a major role in determining the level of HCROI in relation to the effectiveness and productivity of the workforce. The variety of factors that determine the HCROI in terms of effectiveness and productivity can be classified in two broad categories. Some of the factors can be viewed as *internal* determinants of HCROI as it characterise the organisation, while others characterise the *environment* in which the organisation competes. In addition there are factors of which the company has no control over (like the economy) and others where the organisation has control over (like production output).

The following available company descriptive information was collected from *MBFA* to make the benchmark's available companies as detailed as possible:

- Size of the company (e.g. small, medium, large)
- The different sectors (e.g. mining, IT)
- Financial year

Descriptive statistics (M , SD) were used to describe the central tendency and dispersion of HCROI of companies in the total sample. Frequency analysis (Histograms, Cross-tabs) were used to compare levels of HCROI across company characteristic categories. Bar and line graphs will graphically depicted trends in the research data. Further exploratory data analysis was used to drill down into results, as required. No inferential statistics will be used to assess differences across these means of comparison, since the present

research is descriptive in nature, and not explanatory, where differences would typically be hypothesised a priori.

Prior to analyses of data, the distribution form of study variables was investigated. When the Kolmogorov-Smirnov Test was done to determine whether the null hypothesis of normality of distribution of study variables should be retained or rejected, a hypothesis test summary table was compiled which can be found in Appendix G. The significance level used is $p = .05$. From an inspection of the table, any value smaller than $p < .05$ indicates a non-normal distribution. In the attached list, there are three Kolmogorov-Smirnov test results indicating to retaining the null hypothesis, namely company numbers 7, 8 and 44. The significance for company number 7 indicates $p = .217$ (therefore $p > .05$), the significance for number 8 indicates $p = .180$ (thus $p > .05$), and number 44 as $p = .230$ (meaning $p > .05$). In the rest of the Kolmogorov-Smirnov test results the significance indicates a zero ($p < .05$).

The differences in means of HCROI between sectors and company size categories will be tested for significance with t-tests and ANOVA (Kerlinger & Lee, 2000).

This concludes the discussion of the research method for the proposed study. In the chapter, the research initiating question, the research problem, sample and research design was discussed. This was followed by a discussion of the measurement of HCROI in this study and how the data were collected. The chapter was concluded by the discussion of the statistical analysis of data.

In the following chapter, (Chapter 4), the results will be discussed, after which this research will be concluded by a summary and conclusions and recommendations for future research in Chapter 5.

CHAPTER FOUR

RESEARCH RESULTS

4.1 Introduction

In the preceding chapter, the research method used to address the research question of the present research was explained. The current chapter reports the results of the statistical analysis of research data. Chapter 4 is structured as follows: First, a presentation of the descriptive statistics of elements from which human capital return on investment (HCROI) was calculated will be discussed, namely company turnover, cost, profit and pay and benefits. Next, the descriptive statistics for HCROI are reported, followed by a comparison of HCROI across industries, company size categories, and year-on-year comparisons (2006-2010). Last, the chapter concludes with a summary of results.

Therefore the discussion of the descriptive statistics of the different elements used to calculate HCROI will be discussed next.

4.2 Descriptive Statistics of Turnover, Cost, and Pay and Benefits

The descriptive statistics of the different elements that were used in the calculation of the HCROI ratio are discussed in this section. Every element is explained individually and important findings over the years (2006 – 2010) are presented. The elements under discussion are turnover, cost and pay and benefits.

4.2.1 Turnover

Turnover represents the total financial turnover for the year under review as reflected in the annual financial statements. Turnover, also synonymous to revenue, refers to purchases, sales or other transactions entered during a particular period. Table 4.1 indicates the number of listed companies ($N = 319$) showing turnover-values for the period reviewed in this study (2006-2010). There was a gradual increase every year of companies who listed their Turnover (2006: $n = 150$, 2007: $n = 227$, 2008: $n = 251$, 2009: $n = 252$, 2010: $n = 256$). The reason may be, firstly, that the company was not listed on the stock

exchange by 2006, or second, that the company was listed, but did not report all its financials separately. Last, it was possible that some companies listed during the period under review.

Table 4.1

Number of companies included and excluded for Turnover over study period (2006 – 2010)

	Turnover					
	Cases					
	Included		Excluded		Total	
	<i>n</i>	<i>P</i>	<i>n</i>	<i>P</i>	<i>N</i>	<i>P</i>
2006	150	47.0%	169	53.0%	319	100.0%
2007	227	71.2%	92	28.8%	319	100.0%
2008	251	78.7%	68	21.3%	319	100.0%
2009	252	79.0%	67	21.0%	319	100.0%
2010	256	80.3%	63	19.7%	319	100.0%

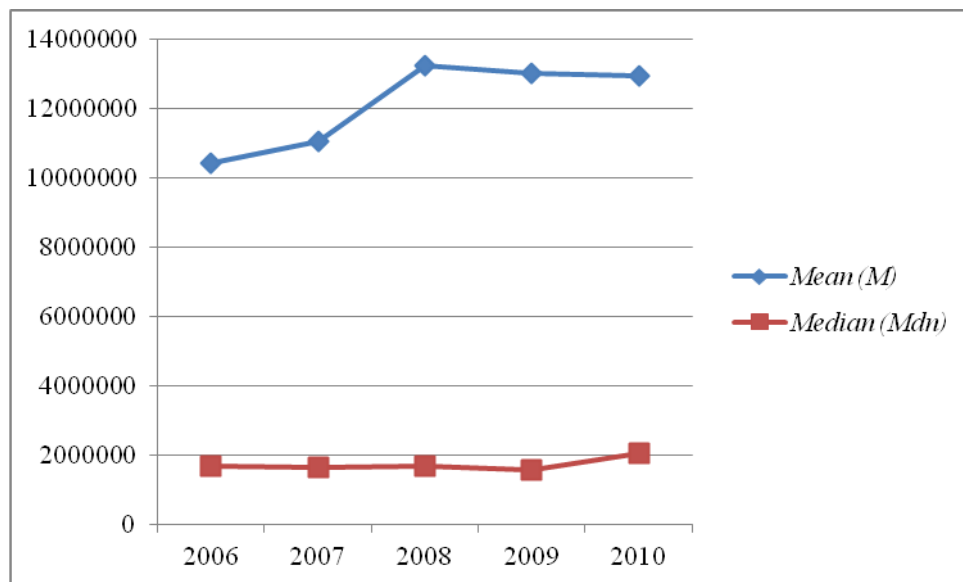
Table 4.2 lists the descriptive statistics for Turnover, from which certain trends can be identified. All values listed are in thousands of South African Rands (ZAR). With regard to the maximum turnover values, there was a constant increase until 2008 (2006: 223897440, 2007: 278460900, 2008: 491246980) with a relatively steep increment to 2008. However, during 2009 and 2010 turnover went down (2009: 423780840, 2010: 387009340). The average (mean or *M*) for turnover over the years also showed an initial growth until 2008 (2006: *M* = 10448482.20, 2007: *M* = 11072529.43, 2008: *M* = 13272656.82), but then there was a slight downturn for 2009 and 2010 (2009: *M* = 13046442.01, 2010: *M* = 12964484.36). If the median (*Mdn*) for these years is plotted graphically (Figure 4.1) a rather flat line with a small increase for 2010 (2010: *Mdn* = 2037067.75) is seen, which indicates a more constant HCROI ratio when using the median, as opposed to the mean HCROI ratio.

The standard deviation values for turnover appear far from the mean and this increases with the years during 2008 (*SD* 2006 = 28768341.105, *SD* 2007 = 28691278.419, *SD* 2008 = 40983037.990), but then shows a slight drop for 2009 and in 2010 it dropped slightly more, but still remained higher than in 2006 and 2007 (*SD* 2009 = 36962304.948, *SD* 2010 = 34983606.406).

Table 4.2

Descriptive statistics for Turnover for the study period (2006 – 2010)

Turnover					
	2006	2007	2008	2009	2010
<i>n</i>	150	227	251	252	256
Minimum	1	80	60	39	181
Maximum	223897440	278460900	491246980	423780840	387009340
Range	223897439	278460820	491246920	423780801	387009159
Mean (<i>M</i>)	10448482.20	11072529.43	13272656.82	13046442.01	12964484.36
Median (<i>Mdn</i>)	1689820.50	1634164.00	1659201.00	1546142.50	2037067.75
Std. Deviation (<i>SD</i>)	28768341.105	28692378.419	40983037.990	36962304.948	34983606.406
Kurtosis	37.858	40.095	78.267	64.974	56.617
Skewness	5.708	5.541	7.735	6.966	6.489

Note. Values in ZAR (‘000)*Figure 4.1.* Difference between the mean and median for Turnover over the study period (2006 – 2010)

A possible explanation for this noticeable difference between die mean and median (depicted in Figure 4.1) in turnover for companies over the study period may be that experienced growth in turnover expanded quite rapidly in a few companies, thereby acting as outliers that disproportionately bias the mean (M). Another explanation may be that mean turnover increased up to 2008 because of economic prosperity and then basically stagnated during the subsequent recessionary period. However, investigating the median (Mdn) reveals that it remained rather consistent during the years, despite the economic cycle. Turnover started off with a higher median in 2006 ($Mdn = 1689820.50$) and systematically increased from 2007 to 2008 ($Mdn: 2007 = 1634164.00, 2008 = 1659201.00$), but dropped during 2009 ($Mdn = 1546142.50$), reaching the highest median of the study period in 2010 ($Mdn = 2037067.75$). In the graph, however, the effect does not seem as drastic.

4.2.2 Cost

This figure represents the total cost of the turnover for the year in question for a company in the sample. Table 4.3 lists the percentage of companies listing a Cost value during the period covered by the study.

Table 4.3

Number of cases included and excluded for Cost for the study period (2006 – 2010)

	Cost					
	Cases					
	Included		Excluded		Total	
	<i>n</i>	<i>P</i>	<i>n</i>	<i>P</i>	<i>N</i>	<i>P</i>
2006	93	29.2%	226	70.8%	319	100.0%
2007	151	47.3%	168	52.7%	319	100.0%
2008	172	53.9%	147	46.1%	319	100.0%
2009	174	54.5%	145	45.5%	319	100.0%
2010	174	54.5%	145	45.5%	319	100.0%

Table 4.4 reports the descriptive statistics for the Cost variable during the study period. The minimum cost value was zero ($n = 0$) during 2006, but constantly increased to a value (in 2010) of R662 000. The annual maximum cost values declined from 2006 to 2007 (2006:137498700, 2007: 99369750), increased again for 2008 (128451260), remained the same for 2009 (128963200), and finally dropped slightly for 2010 (116906170). Again, the latter values indicated thousands (ZAR), i.e., each should be multiplied by 1000 to obtain the actual Rand value.

Again, there was a stark difference between the mean and the median for cost over the study period (see Figure 4.2). The mean cost lies around R7 billion Rand (M : 2006: 6633227, 2007: 6365187, 2008: 7059955, 2009: 7574785, and 2010: 7598216) with a relative drop in 2007, but a steady increase up to 2010 again. The median cost values showed a much more constant value compared to the mean. The median started higher during 2006 ($Mdn = 1710181$), dropped to basically the same level for 2007 and 2008 (Mdn : 2007 = 1466833.00, 2008 = 15594686.507), increased slightly for 2009 and 2010 respectively (Mdn : 2009 = 1552571.00, 2010 = 1595201.50). Inflationary pressures and the general expansion of trading activity could have led to these annual cost increases.

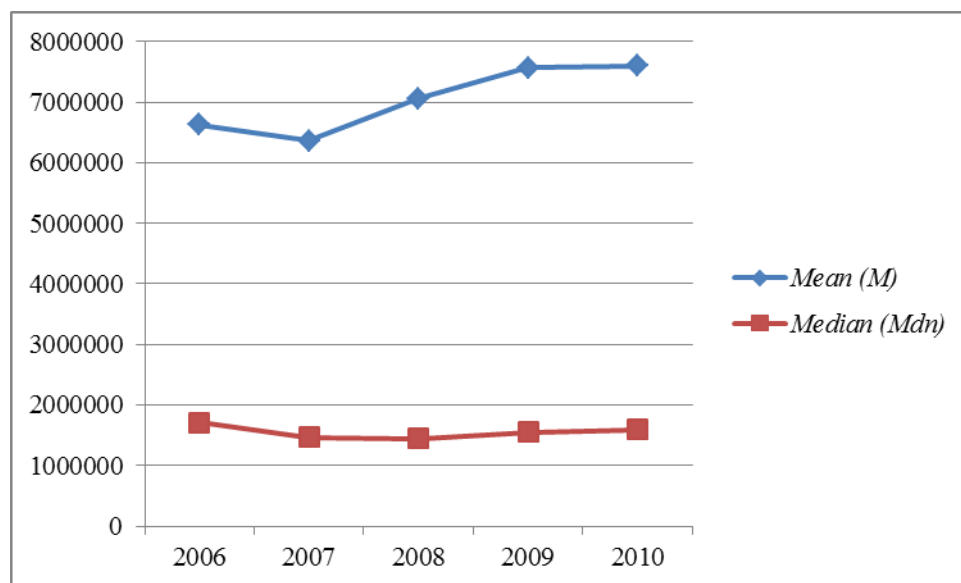


Figure 4.2. Difference between the mean and median for Cost for the study period (2006 – 2010)

Although the dispersion of cost values for all companies in the sample remains steady across the years studied, a relatively higher standard deviation than in the other years was experienced in two years

(*SD*: 2006 = 16642458.915, 2009 = 16192478.842). The year with the lowest standard deviation was 2007 (*SD* = 13457551.605).

Table 4.4

Descriptive statistics for Cost for the study period (2006 – 2010)

	Cost				
	2006	2007	2008	2009	2010
<i>n</i>	93	151	172	174	174
Minimum	0	71	298	301	662
Maximum	137498700	99369750	128451260	128963200	116906170
Range	137498700	99369679	128450962	128962899	116905508
Mean (<i>M</i>)	6633227.06	6365187.47	7059955.69	7574785.95	7598216.13
Median (<i>Mdn</i>)	1710181.00	1466833.00	1448000.00	1552571.00	1595201.50
Std. Deviation (<i>SD</i>)	16642458.915	13457551.605	15594686.507	16192478.842	15690485.150
Kurtosis	42.874	20.883	26.776	24.417	19.031
Skewness	5.933	4.094	4.543	4.371	3.897

Note. Values in ZAR (‘000)

This concludes the discussion of the turnover and cost values for companies studied in the present sample. The following discussion concerns pay and benefits, which is more closely related to the human capital costs of the company.

4.2.3 Pay and benefits

Pay and benefit costs, as used in the present study, refers to all human resource compensation costs in the form of direct pay, benefits and directors’ emoluments, but excluding share-based payments, incentive payments and Black Economic Empowerment transactions. Table 4.5 lists the number of companies reporting pay and benefit cost values. As with cost, there was an initial increase in the inclusion of pay and benefits values from 2006 to 2007 (*n*: 2006: 168, 2007: 256) but it remained steady after 2007. Whereas only 54% of the companies included their cost value during 2010, which was the best inclusion,

the pay and benefit value started off, in 2006, from nearly 53% ($n = 168$) inclusion to end in 2010 with 89% of all the pay and benefit values ($n = 284$), which is identified as a very positive trend in human capital related reporting standards.

Table 4.5

Number of cases included and excluded for Pay and Benefits for the study period (2006 – 2010)

Pay and Benefits						
Cases						
	Included		Excluded		Total	
	<i>n</i>	<i>P</i>	<i>n</i>	<i>P</i>	<i>N</i>	<i>P</i>
2006	168	52.7%	151	47.3%	319	100.0%
2007	256	80.3%	63	19.7%	319	100.0%
2008	280	87.8%	39	12.2%	319	100.0%
2009	284	89.0%	35	11.0%	319	100.0%
2010	284	89.0%	35	11.0%	319	100.0%

Table 4.6 lists the descriptive statistics for Pay and Benefits. The year-on-year trends in Pay and Benefit costs are depicted graphically in Figure 4.3. As with the Cost figure, maximum values for pay and benefit values showed a slight drop from 2006 to 2007 (2006: 32929280, 2007: 30110550) (thousands), followed by a slight increase for 2008 and 2009 (2008: 36112720, 2009: 36756200), with another slight drop to 2010 (34509640).

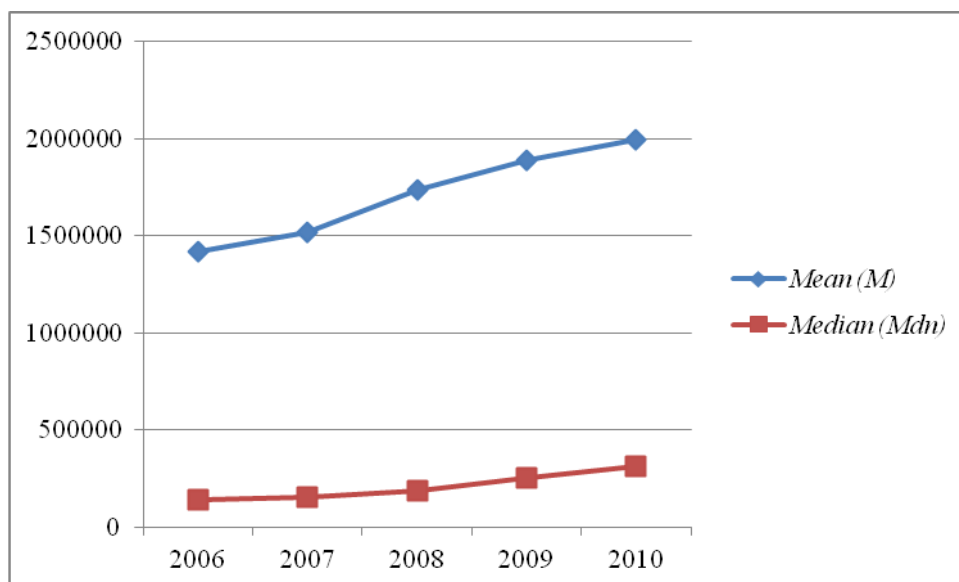
Table 4.6

Descriptive statistics for Pay and Benefits for the study period (2006 – 2010)

Pay and Benefits					
	2006	2007	2008	2009	2010
<i>n</i>	168	256	280	284	284
Minimum	17	15	14	14	14
Maximum	32929280	30110550	36112720	36756200	34509640
Range	32929263	30110535	36112706	36756186	34509626
Mean (<i>M</i>)	1420493.14	1521737.09	1739164.14	1889291.22	1993029.04
Median (<i>Mdn</i>)	140917.50	152774.80	187068.08	251514.50	310820.50
Std. Deviation (<i>SD</i>)	3735134.617	3676021.057	4398521.020	4625054.891	4626984.349
Kurtosis	35.153	22.868	24.636	25.178	21.703
Skewness	5.260	4.283	4.515	4.542	4.221

Note. Values in ZAR (‘000)

From a comparison between the means and medians of turnover (see Figure 4.3), employee remuneration costs gradually increased throughout the study period, despite the recession experienced from 2008 - 2010. It can be concluded that South African companies apparently did not engage in large-scale lay-offs to shed employee costs, that were typical in the USA and EU during the recessionary period. Both the mean and median Pay and Benefit cost values showed a constant increase over the study years (*M*: 2006 = 1420493.14, 2010 = 1993029.04, *Mdn*: 2006 = 140917.50, 2010 = 310820.50). The steady increase in compensation costs may also indicate that, due to economic hardship, union demands for salary increases led to pay and benefits increasing, as noticed during the year of 2011. Another possible explanation may also be that greater profits than expected were realised and companies either hired more staff, or increased the salaries of current staff because of greater production or service demands.



Note. Values in ZAR ('000)

Figure 4.3. Mean and median comparisons for Pay and Benefits for the study period (2006 – 2010)

The dispersion of remuneration costs showed a constant increase (SD : 2006 = 3735134.617, 2008 = 4398521.020, 2009 = 4625054.891, 2010 = 4626984.349), except for 2007 (SD = 3676021.057) when there was a slight drop in dispersion. The reasons for these trends are not clear, though.

In the foregoing discussions, year-on-year trends in central tendency and dispersion of the different elements used to calculate HCROI — they included turnover, cost and employee pay and benefits — were described. Table 4.7 presents a summary of constituent elements of the HCROI ratio for all companies over the study period (2006 – 2010).⁶

⁶ It will be noticed that compensation for Directors and Staff is still tabled separately and that pay and benefits, at the bottom of the table, represents the combined valued of these two elements.

Table 4.7

Descriptive statistics for the different HCROI ratio elements for the study period (2006 – 2010)

Year	Element	<i>n</i>	Range	Minimum	Maximum	<i>M</i>	<i>SD</i>	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
2010	Turn	256	387009159	181	387009340	12964484.36	34983606.406	6.489	.152	56.617	.303
	Cost	174	116905508	662	116906170	7598216.13	15690485.150	3.897	.184	19.031	.366
	Income	292	187717586	-735121	186982465	4358900.41	15198364.311	7.610	.143	77.177	.284
	Profit	291	96834477	-2460727	94373750	1593542.69	7138626.089	9.485	.143	108.236	.285
	Directors	279	657935	14	657949	23991.45	51683.601	8.404	.146	89.425	.291
	Staff	273	34164709	421	34165130	2048815.51	4675660.431	4.146	.147	20.897	.294
2009	Turn	252	423780801	39	423780840	13046442.01	36962304.948	6.966	.153	64.974	.306
	Cost	174	128962899	301	128963200	7574785.95	16192478.842	4.371	.184	24.417	.366
	Income	293	141499969	-1774993	139724976	3591755.29	12731877.644	6.385	.142	52.073	.284
	Profit	292	75562527	-24078527	51484000	895481.39	4513933.942	6.286	.143	67.324	.284
	Directors	280	217072	14	217086	18729.32	24181.467	3.619	.146	19.606	.290
	Staff	270	36671790	10	36671800	1967831.47	4709104.837	4.440	.148	24.013	.295
2008	Turn	251	491246920	60	491246980	13272656.82	40983037.990	7.735	.154	78.267	.306
	Cost	172	128450962	298	128451260	7059955.69	15594686.507	4.543	.185	26.776	.368
	Income	287	270923720	-36696527	234227193	4197376.51	18482427.698	8.099	.144	88.140	.287

	Profit	285	170854908	-39000528	131854380	1413453.60	9209933.651	10.186	.144	144.616	.288
	Directors	274	189331	14	189345	19223.06	28041.586	3.632	.147	15.951	.293
	Staff	258	36013531	69	36013600	1867049.77	4533542.565	4.341	.152	22.726	.302
2007	Turn	227	278460820	80	278460900	11072529.43	28692378.419	5.541	.162	40.095	.322
	Cost	151	99369679	71	99369750	6365187.47	13457551.605	4.094	.197	20.883	.392
	Income	264	121581972	-936246	120645726	3563343.85	12035075.588	6.112	.150	44.917	.299
	Profit	263	66141500	-3890000	62251500	1210076.17	4607669.494	9.636	.150	119.337	.299
	Directors	253	287053	15	287068	20875.04	34835.614	4.118	.153	21.753	.305
	Staff	234	30074946	354	30075300	1642236.36	3792785.464	4.114	.159	21.104	.317
2006	Turn	150	223897439	1	223897440	10448482.20	28768341.105	5.708	.198	37.858	.394
	Cost	93	137498700	0	137498700	6633227.06	16642458.915	5.933	.250	42.874	.495
	Income	176	93912959	-265526	93647433	3651141.87	11722580.856	5.397	.183	32.944	.364
	Profit	176	46841890	-420000	46421890	1494475.91	4696486.209	6.216	.183	50.140	.364
	Directors	168	203083	17	203100	16473.69	22049.470	4.357	.187	30.707	.373
	Staff	144	32902185	15	32902200	1638022.69	3974113.585	4.907	.202	30.555	.401
2010	Pay & Benefits	284	34509626	14	34509640	1993029.04	4626984.349	4.221	.145	21.703	.288
2009	Pay & Benefits	284	36756186	14	36756200	1889291.22	4625054.891	4.542	.145	25.178	.288
2008	Pay & Benefits	280	36112706	14	36112720	1739164.14	4398521.020	4.515	.146	24.636	.290
2007	Pay & Benefits	256	30110535	15	30110550	1521737.09	3676021.057	4.283	.152	22.868	.303

2006	Pay & Benefits	168	32929263	17	32929280	1420493.14	3735134.617	5.260	.187	35.153	.373
	Valid <i>n</i> (listwise)	78									

Note. Values in ZAR ('000)

This concludes the discussion of constituent elements of human capital effectiveness, as measured by HCROI. From these values, HCROI ratios were calculated for each company. A thorough discussion of the descriptive statistics for HCROI follows next.

4.3 Human Capital Return on Investment (HCROI)

In the present study, human capital effectiveness was measured by calculating the Human Capital Return on Investment (HCROI) (Fitz-enz, 2010) ratio for each company in the sample, within each year. The discussion of HCROI, being rather lengthy, is presented in two parts – the descriptive statistics first, followed by graphical depictions of the frequency distributions, second.

4.3.1 Central tendency of HCROI: Means and Median

Table 4.8 reports the descriptive statistics for Human Capital Return on Investment (HCROI) for companies included in the present study. Due to listwise deletion of cases for which missing values were found for some of the element variables discussed in the preceding section, only a small number ($n = 92$) of HCROI ratios were calculated for 2006. The number of valid HCROI values progressively increases to 2010 (2010: $n = 174$). Since the percentage of companies were calculated HCROI values in the sample is just above half ($P = 54.54\%$), the degree to which study results can be generalised to the full sample is limited somewhat.

Various trends can be observed when comparing the central tendency of HCROI from year-to-year. The mean HCROI for 2006 ($M = 15.90$) is an outlier compared to the remainder of annual means within the study period. The other years (2007 – 2010) indicate a steadier, much lower, mean, with 2009 and 2010 showing the lowest mean (M : 2007 = 4.815, 2008 = 5.135, 2009 = 3.008, 2010 = 3.059), with a peak in 2008. It is noticeable that the median (Mdn) for all the companies across the different years is constantly more or less centered around the value of 3 (Mdn : 2006 = 3.126, 2007 = 3.036, 2008 = 3.163, 2009 = 2.897, 2010 = 2.949). To use the more reliable median value as benchmark rather than the mean is therefore preferable, because the median is not influenced by outliers as in the case of the mean. The percentile rank scores listed in Table 4.8 represent another tool for benchmark users to determine how many other companies fall within respective score ranges. For example, if a company obtained an HCROI value of 4.52 for 2007, it would mean that they had equal or higher human capital effectiveness ratios (HCROI) than 80 % of the companies represented in 2007.

Table 4.8

Descriptive statistics of HCROI for the study period (2006 – 2010)

		HCROI				
		2006	2007	2008	2009	2010
<i>n</i>	Valid	92	151	172	174	174
	Missing	227	168	147	145	145
Mean (<i>M</i>)		15.908	4.815	5.135	3.008	3.059
Median (<i>Mdn</i>)		3.126	3.036	3.163	2.897	2.949
Mode		.35 ^a	2.80 ^a	2.73 ^a	3.30	3.18 ^a
Percentiles (<i>P</i>)	10	1.668	1.783	1.789	1.473	1.588
	20	2.238	2.223	2.212	1.881	1.896
	30	2.510	2.457	2.667	2.298	2.227
	40	2.864	2.778	2.857	2.575	2.568
	50	3.126	3.036	3.163	2.897	2.949
	60	3.506	3.474	3.464	3.134	3.147
	70	3.981	3.868	3.801	3.449	3.388
	80	5.034	4.526	4.360	3.838	3.780
	90	12.843	6.490	6.697	4.752	4.282

Note. ^a. Multiple modes exist. The smallest value is shown

In addition to percentile rank scores, frequency tables were compiled to give a more exact indication of frequency of companies at respective HCROI ratio values within each year. For convenience, these tables—which also indicate extreme low and high HCROI values clearly—are included as Appendix D. Some of the information referred to in the discussions below is quoted from these tables.

As a side-note regarding human capital reporting in published financials, the number of companies listing the required information for these metrics deserves mention. Table 4.9 lists the frequency of HCROI ratio observations across years. The table shows that the number of missing values dropped substantially from 2006 to 2010 (*P*: 2006 = 71.2 %, 2010 = 45.5 %). Another aspect worth highlighting is that the HCROI

values calculated in 2009 and 2010 represented more than half of the total number of companies. In other words, for the more recent years, it was possible to calculate human capital effectiveness indicators such as HCROI for the majority of companies listed in the present study.

Table 4.9

Number of cases included and excluded for HCROI for the study period (2006 – 2010)

	HCROI					
	Cases					
	Included		Excluded		Total	
	<i>n</i>	<i>P</i>	<i>n</i>	<i>P</i>	<i>N</i>	<i>P</i>
2006	92	28.8%	227	71.2%	319	100.0%
2007	151	47.3%	168	52.7%	319	100.0%
2008	172	53.9%	147	46.1%	319	100.0%
2009	174	54.5%	145	45.5%	319	100.0%
2010	174	54.5%	145	45.5%	319	100.0%

4.3.2 Frequency distribution of HCROI for the study period (2006 – 2010)

In this section, the frequency distribution of HCROI values for the study period (2006 – 2010) is discussed. Table (4.10) reports descriptive statistics that speak to the distribution of HCROI within the sample, i.e., including kurtosis and skewness. Kurtosis explains the ‘peakedness’ of the distribution of the HCROI values — a high kurtosis refers to more of the variance occurring because of infrequent extreme deviations, as opposed to frequent modestly-sized deviations. A high kurtosis score can be seen in year 2006 (Kurtosis = 86.006), whereas the lowest kurtosis score is seen in year 2009 (Kurtosis = 30.334). The standard deviations for HCROI of the different years are discussed together with the appropriate graphs (following below).

Table 4.10

Summary of the descriptive statistics for HCROI (2006 – 2010)

	HCROI				
	2006	2007	2008	2009	2010
<i>n</i>	92	151	172	174	174
Minimum	.35	.75	1.02	-16.16	-8.89
Maximum	828.38	64.81	81.60	17.00	27.30
Range	828.03	64.06	80.59	33.16	36.19
Mean (<i>M</i>)	15.9082	4.8152	5.1352	3.0083	3.0596
Median (<i>Mdn</i>)	3.1268	3.0369	3.1637	2.8971	2.9492
Std. Deviation (<i>SD</i>)	87.04928	7.59387	9.16892	2.39329	2.57627
Kurtosis	86.006	36.082	40.410	30.334	49.593
Skewness	9.155	5.624	5.979	-1.322	4.910

Note. Monetary values are in ZAR '000

A discussion of the frequency distribution for HCROI for each year within the study period (2006 – 2010) follows. Figures 4.4 to 4.8 report the histograms for HCROI from 2006 to 2010, respectively. When the graph for 2006 (Figure 4.4) is examined, it is evident that most companies ($N \approx 90$) fell in the same range (between HCROI of 0 and 50). The lowest HCROI value for 2006 was .35 and the highest, as indicated on the graph, was 828.38. Outliers are discussed under 4.4.

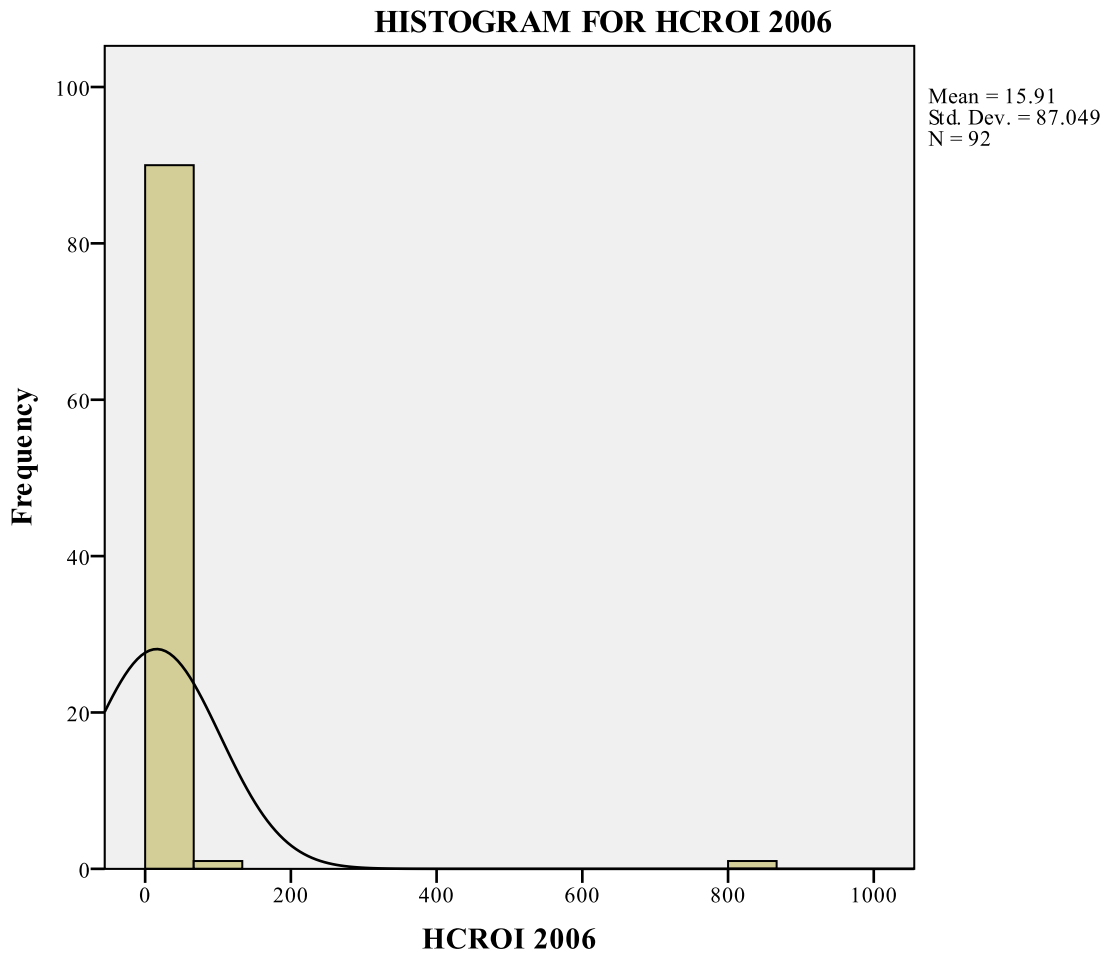


Figure 4.4. HCROI frequency bar chart for 2006

Figure 4.5 shows the HCROI frequency distribution for 2007. In 2007, the majority of companies had HCROI ratios below 20. The lowest HCROI value was .75, also an improvement from 2006 (HCROI = .35), and the highest HCROI ratio was 64.81.

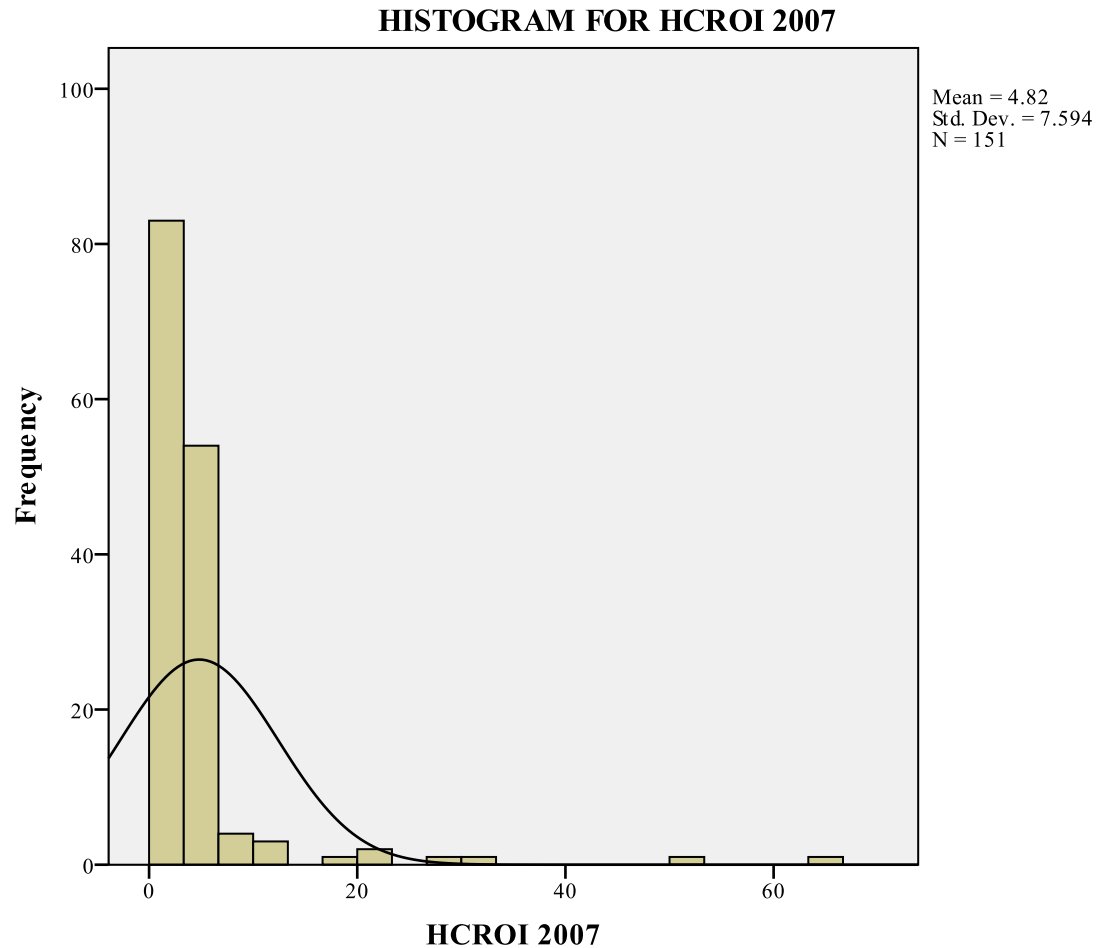


Figure 4.5. HCROI frequency bar chart for 2007

Figure 4.6 shows a higher standard deviation in HCROI ($SD = 9.16$) than for 2007 ($SD = 7.59$), with a higher HCROI mean in 2008 ($M = 5.13$) than for 2007 ($M = 4.81$). The highest HCROI ratio for 2008 was 81.60, which is higher than that of 2007 (HCROI = 64.81). The lowest HCROI for 2008 was 1.02.

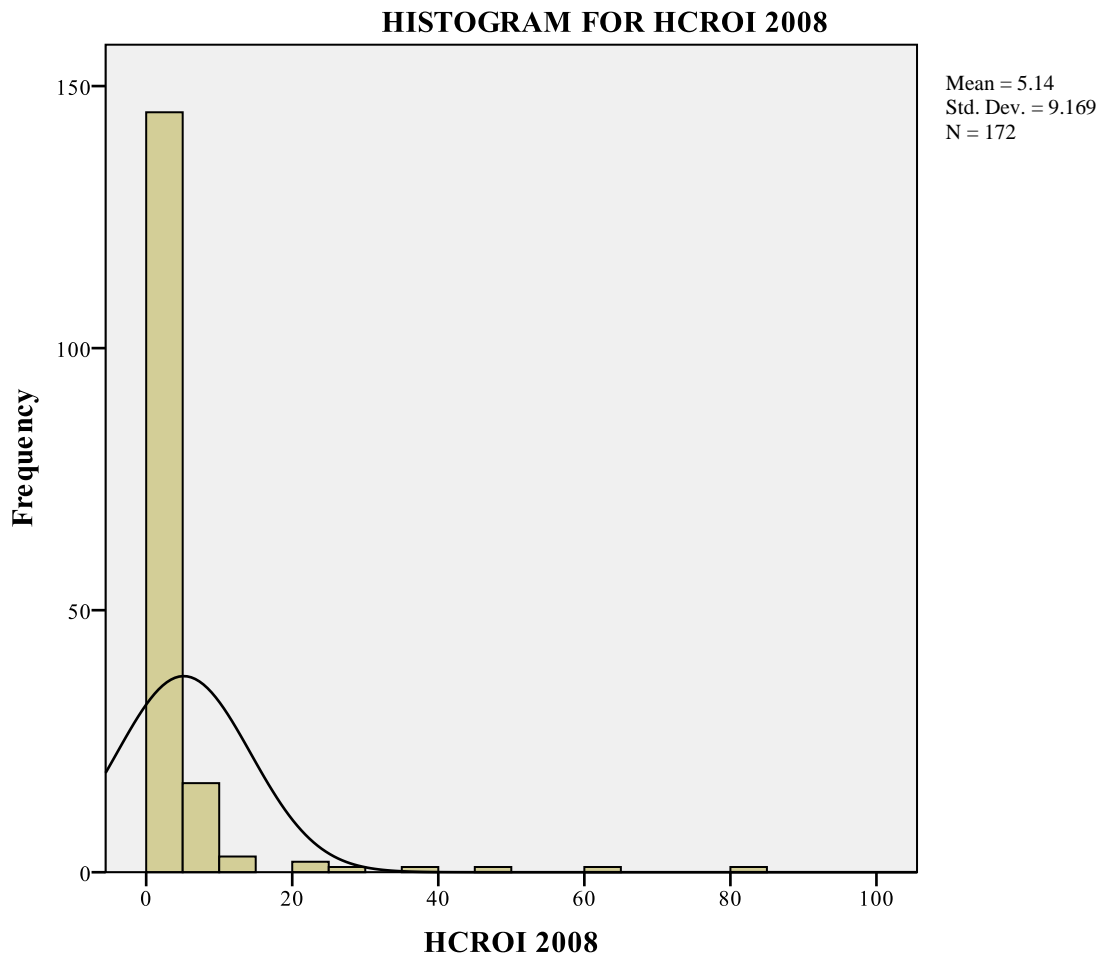


Figure 4.6. HCROI frequency bar chart for 2008

Figures 4.7 and 4.8 show the frequency distribution of HCROI for 2009 and 2010, respectively. These results appear to be very similar. The respective standard deviations (SD : 2009 = 2.39, 2010 = 2.57) varied little. As mentioned before, the standard deviation for 2007 was slightly lower than the one in 2008 (SD : 2007 = 7.59, 2008 = 9.16). When the means are compared, it is also clear that there basically is no difference between these years (M : 2009 = 3.00, 2010 = 3.05) and the same applies to the median (Mdn : 2009 = 2.89, 2010 = 2.94). When the highest and lowest HCROI values are compared, the similarities are also noticeable (lowest HCROI: 2009 = -16.16, 2010 = -8.89, highest HCROI: 2009 = 17, 2010 = 27.30).

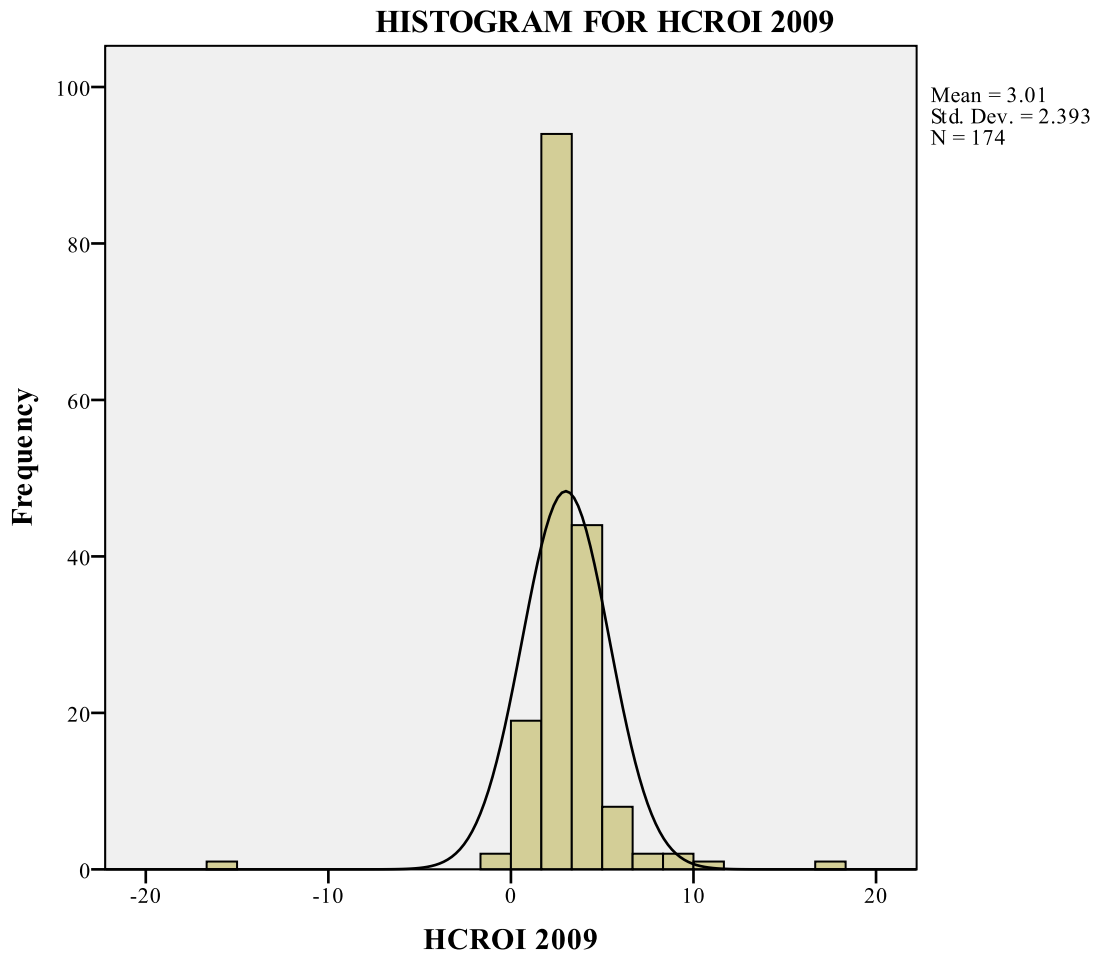


Figure 4.7. HCROI frequency bar chart for 2009

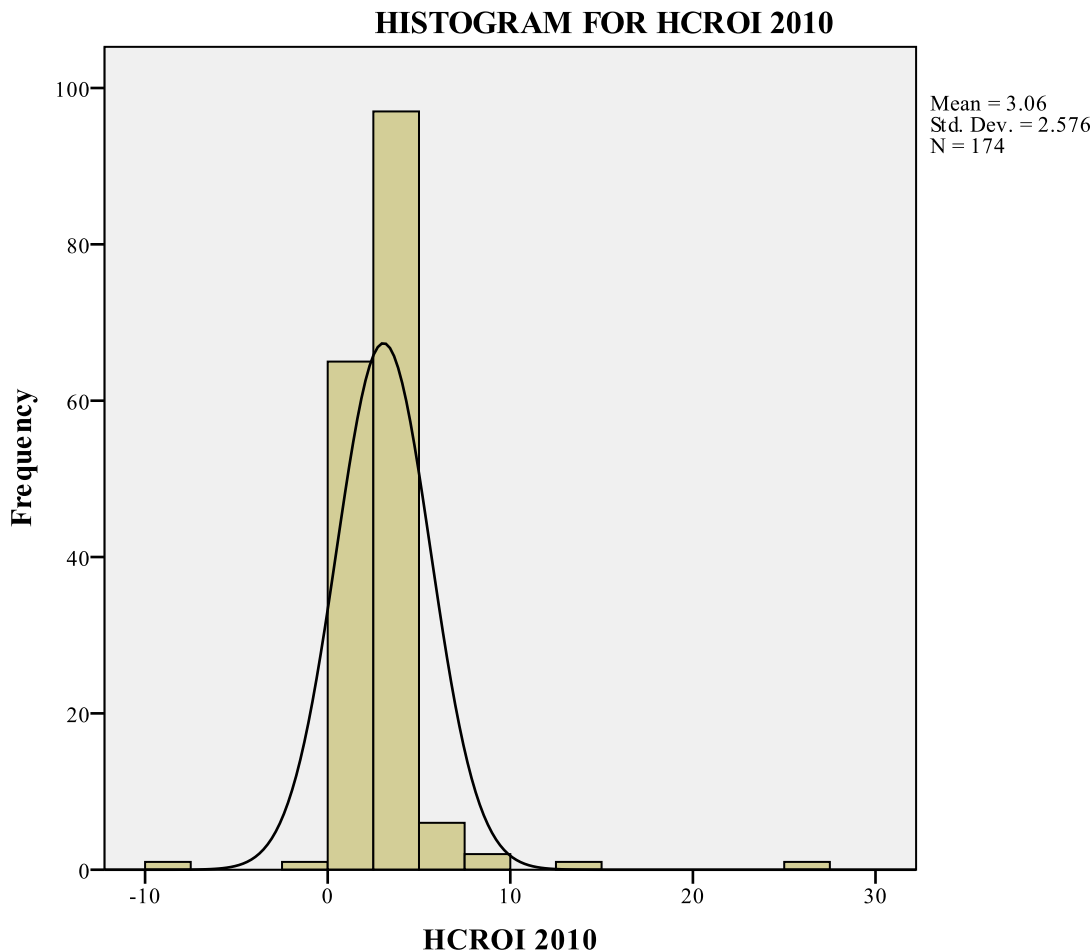


Figure 4.8. HCROI frequency bar chart for 2010

If the different graphs for the different years are compared, it is clear that the ‘peakedness’ for 2010 is the highest, followed by 2009. The peak of the kurtosis indicates how much of the distribution is centred on the distribution mean. The greater the kurtosis coefficient, the more peaked the distribution around the mean. The kurtosis coefficient of a normal distribution is usually 3 which means the distribution of HCROI can be described as mesokurtic. In this study, however, the kurtosis coefficient is greater than 3, which makes the distribution leptokurtic (Ghiselli, Campbell & Zedeck, 1981). These results show that HCROI ratios in the sample are not normally distributed — a finding worth mentioning when considering the possibility that future studies might want to conduct multivariate analyses using HCROI ratios as either IVs or DVs. When using non-normally distributed variables in multivariate analyses, the resulting parameter estimates can be misleading (Hair, Black, Babin & Anderson, 2010) and such variables require adequate transformations before statistical analysis (Tabachnik & Fidell, 2001). In the present sample, the

cause of the extreme kurtosis could reside in the few extreme values (i.e., outliers) that cause extreme kurtosis. Researchers that intend using HCROI ratios as research variables should consider conducting linear transformation of variables to reduce kurtosis, or by removing outliers if these are statistically significant (Field, 2009; Tabachnick & Fidell, 2001).

4.3.3 General conclusions: HCROI

In the preceding section, the frequency distribution of human capital effectiveness within each year studied, as indexed by HCROI ratios, was discussed in detail. In this next section, HCROI means, and also HCROI components, are compared across years to obtain a more holistic view of possible temporal trends in these variables when tracked year-on-year.

Figure 4.9 displays the HCROI means within each year of the study period. Clearly, mean HCROI values tend to fluctuate quite substantially year-on-year, but not when the median is studied (Figure 4.10). The reason for this fluctuation is that the means are affected by extreme outliers.

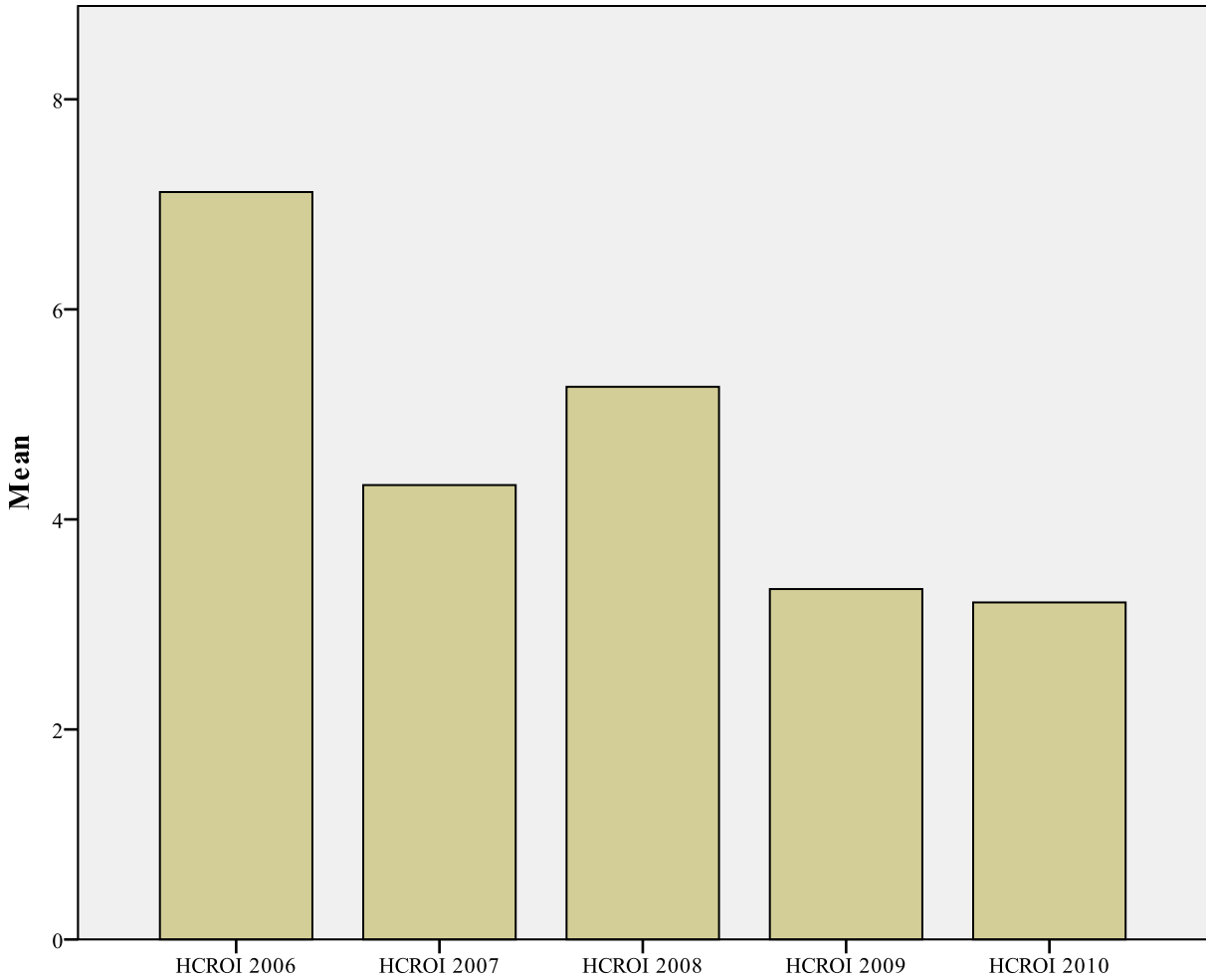


Figure 4.9. Bar graph of the HCROI means for the study period (2006 – 2010)

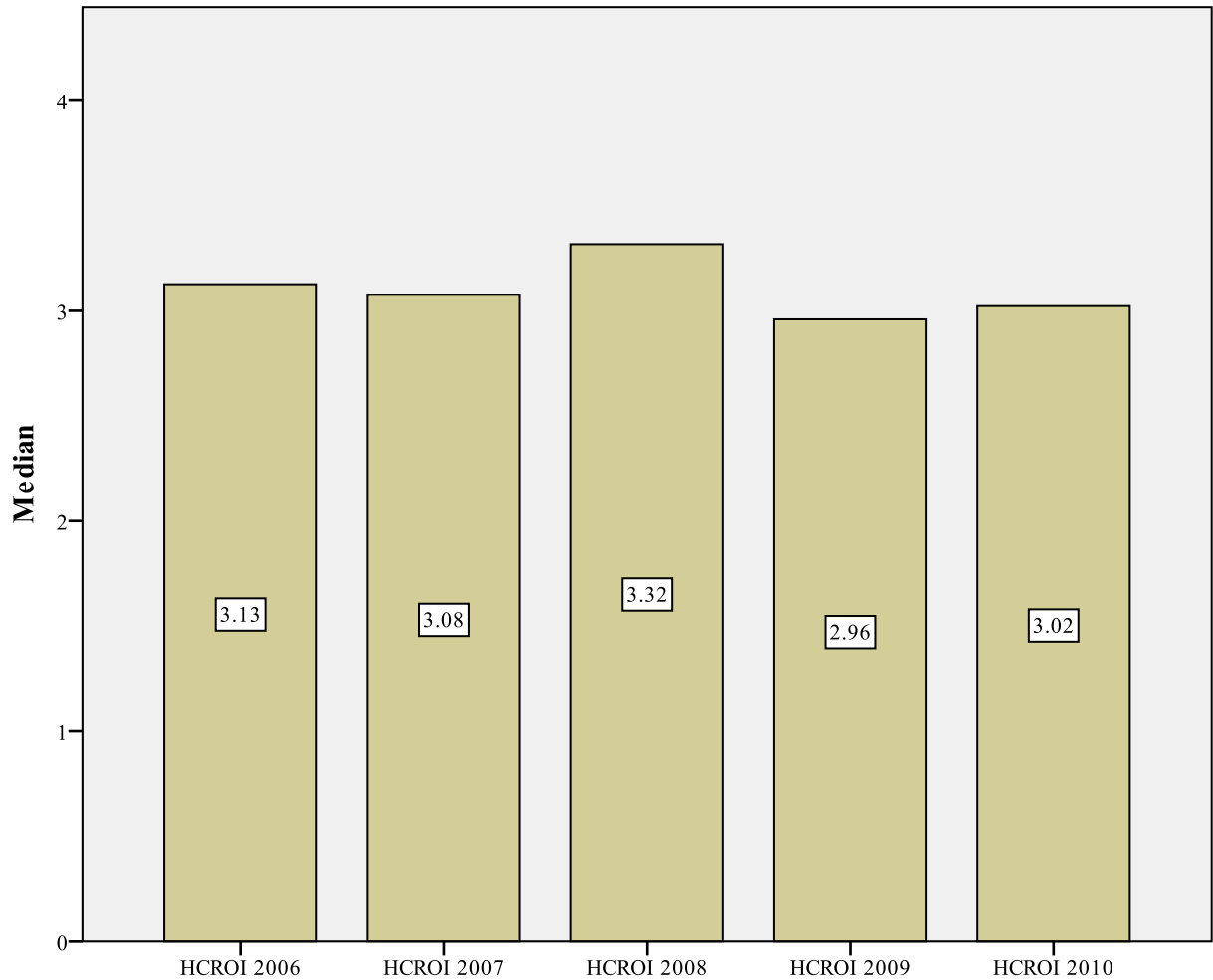


Figure 4.10. Bar graph of the HCROI medians for the study period (2006 – 2010)

Apart from annual trends in HCROI, the ‘causes’ of HCROI also seemed to fluctuate temporally. Figure 4.11 displays year-on-year trends in the medians of the different elements that jointly constitute HCROI. Only turnover is represented by a substantially curved line, but the rest (cost, pay and benefits) are relatively unchanging.

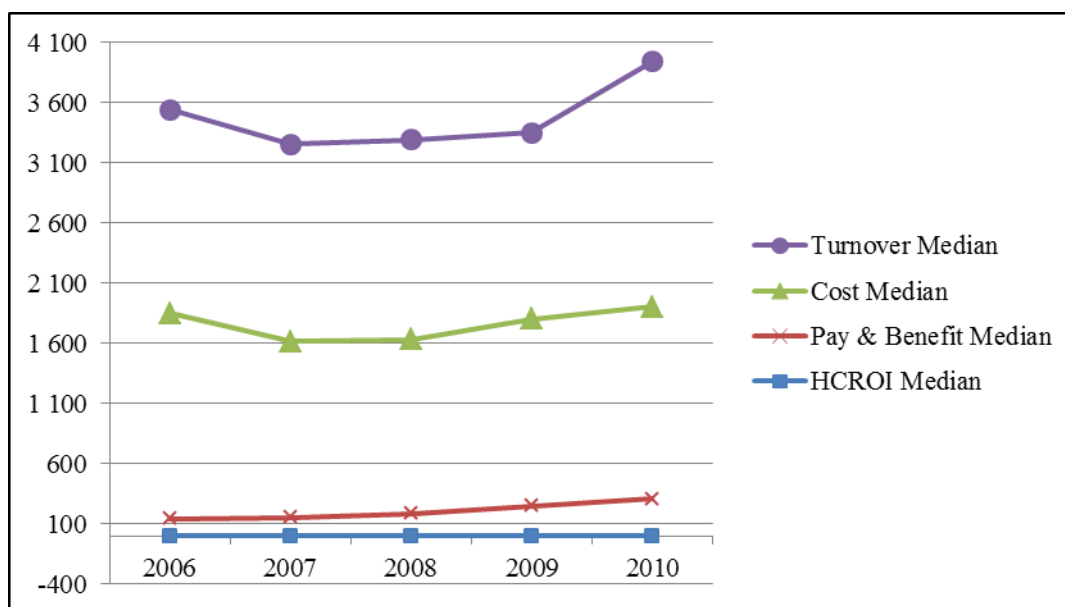


Figure 4.11. HCROI comparison of medians with turnover, cost, pay and benefits

The graph shows clearly that all median values increased slightly towards 2010. In this specific scenario it means that salaries either increased (to keep pace with inflation) or more staff were hired. Although turnover increased — increase turnover could indicate that the company experienced quick growth towards 2010 — overall costs also increased⁷.

Table 4.11

Median values for HCROI and different elements for the study period (2006 – 2010)

	2006	2007	2008	2009	2010
HCROI Median	3.1268	3.0369	3.1637	2.8971	2.9492
Pay & Benefits Median	140917	152774	187068	251514	310820
Cost Median	1710181	1466833	1448000	1552571	1595201
Turnover Median	1689820	1634164	1659201	1546142	2037067

Note. Monetary values are in ZAR ‘000

⁷ These values are ‘lagging’ indicators because results that appear in the 2010 Annual Report reflect events that occurred in 2009.

The frequency tables in Appendix D enable companies that calculate their HCROI for a specific year to determine the cumulative percentage of companies represented at a specific level of human capital effectiveness. If, for example, a company obtained an HCROI value of 2.53 for 2006, the table will show the company's cumulative percentage ($CUM-P = 31.5$). Cumulative percentage is also a way of expressing frequency distributions. More 'finely grained' and precise percentile rank scores for HCROI can be found in the column with heading $CUM-P$. Using these tables could facilitate determining the company's relative position in the market in terms of human capital effectiveness (HCROI) as expressed by the percentile score. This type of interpretation of HCROI — where 'raw' HCROI scores are expressed in more informative units, percentile ranks — also integrates knowledge of the relative distribution of the market in terms of human capital effectiveness. Although useful, it should be cautioned that percentile rank scores should be interpreted with caution when score distribution is non-normal (Nunnally, 1978), as is the case with HCROI.

This concludes the discussion on findings regarding HCROI, which has made it clear that companies should rather use the median as a benchmark because the value of the median is not affected by outliers. It has also been shown that the average of the median HCROI for companies across years sampled was $HCROI = 3.03$, which could be used as a broad benchmark figure of 'average' human capital return on investment in South African listed companies. It has also been shown that more specific comparative evaluations are made possible when frequency tables, listing cumulative percentages of companies at respective levels of HCROI, and percentile rank scores are used.

Since they represent potentially meaningful factors in the determination of HCROI, the next discussion is focused on extreme values, or outliers, of HCROI outliers across the different years studied in the present research.

4.4 Extreme values (outliers) in HCROI frequency distributions

The frequency tables that allow companies to benchmark themselves against industry norms, are provided in Appendix D. Looking at these tables, it is noticeable that there are several outliers — companies with HCROI ratios that are extremely low or far above a 'normal' score.

The first extreme value for HCROI for 2006 (Figure 4.13; $HCROI = 828.38$) was analysed (included as Appendix H) and it showed that it was a large company in the *Real Estate – Investment and Services* sector, with pay and benefits values that were very low for 2006, relative to the other elements (Pay &

Benefit: 1244, Cost: 350912, Income: 999459, Turnover: 1380172). The low pay and benefits may indicate an under-payment of staff, retrenchment in that year, or that the company was only established during 2006 with few personnel. More or less the same tendency can be seen for the other company with an HCROI score of 124.14 (see Table 4.14 in Appendix H). This company's pay and benefit is also shown to be the lowest of all the scores, as could be expected (16 656). The turnover for this company was very high (3 816 000), but the cost and income for 2006 are seen as more or less the same (cost: 1 765 000, income: 1 838 656) and as relatively lower than the turnover.

The frequency table for 2007 starts off with the lowest HCROI value at 3.10, which is fairly good compared to the median that was consistent ($Mdn = \pm 3$) throughout the years. The highest scores here (2007) are 51.04 and 64.81, which will be discussed next. The company identified with HCROI = 64.81 (Figure 4.15 in Appendix H), a small oil and gas producer, presented no values for 2006, which may indicate that the company only started in 2007, and started relatively small in that year. Pay and benefits, profit and income started off as more or less equal on the graph (Pay & Benefits: 70 million, profit: -845, income: 704), but it is evident that the company made no profit, although the turnover was higher (15390), with cost (10923) slightly below turnover. The high HCROI score may be the result of the high turnover and very low salaries or few staff.

The next HCROI outlier for 2007 is the company with HCROI = 51.04, a medium company in the *Basic Resource – Mining Company* sector. In this case, pay and benefits was very low compared with the rest of the values for 2007. Cost and income started off quite equally (Cost: 2 067 187, Income: 2 968 854) and the company, as with the previous company, had a good turnover (4 864 500). Profit was slightly less (2 069 859) than the other values. It seems that high profits were made and little pay and benefits were available for staff, or that there were too few staff, or because the company started small and experienced sudden growth. This may be the reason for the extremely high HCROI value of 51.04 (Figure 4.16, Appendix H).

During 2008 there was also several outliers of 29.31, 36.80, 45.31, the highest, and 1.02, the lowest, but, once again, only the highest two are discussed, namely the HCROI of 64.33 and HCROI of 81.60. For the company with the HCROI of 64.33 it is evident (from Figure 4.17 in Appendix H) that pay and benefits dropped between 2007 and 2008 (2007: 103001, 2008: 4791). This may have been caused by economic hardship that induced retrenchment of staff in this small, *basic resource – mining* company. Profit (17 718) is indicated on the graph as basically the same as pay and benefits, but a few million in Rand higher than pay and benefits. The income was much less than cost for 2008 (Income: 165 373, Cost:

1 198 055) which indicates that the company did not do so well. However, the turnover for 2008 was very high, namely 1 501 470 million, which may have caused the very high HCROI value for 2008. The growth for the company was exceptionally high for 2008.

The next large company under discussion in the *Basic resource – Mining* sector, had an HCROI score of 81.60 for 2008. If pay and benefits are studied in the graph (Figure 4.18 in Appendix H), a very sharp drop is shown between 2007 and 2008 (2007: 8 421 378, 2008: 216 315). This may indicate a severe letting go of personnel during 2008 because of economic hardship. This, however, does not correlate with profit and income that shows a slight increase from the previous year (Profit: 2007 = 12 191 000, 2008 = 14 717 000, and Income: 2007 = 22 298 378, 2008 = 22 832 315). Turnover was very high for 2008 (51 118 000) in comparison with the other values, which indicates strong growth. On the graph, turnover and income reached the highest peak during 2008 (Income: 22832315, Turnover: 51118000). Cost also showed an increase for 2008 (33 682 000). The high 2008 HCROI value therefore may be explained by the growth of the company in turnover, income and profit, and low pay and benefits.

The next outlier to be discussed for 2009 is one with an HCROI value of -16.16. Since this is the most prominent outlier of all, only this one is discussed for 2009. The highest value was 17.00, which is high, but not so exceptional compared to the values that have already been discussed. The company under discussion (HCROI: -16.16) is a small company in the *General Retailer* sector. The graph (Figure 4.19 in Appendix H) shows values for income (994 883), profit (568 100) and pay and benefits (546 283) that are more or less on the same level, and profit as basically the same (slightly higher) than the company's expenses regarding pay and benefits. Income (994 883) was slightly higher, though. What is interesting is the very high cost (13 181 300) that the company showed during 2009, which was far above turnover (3 807 100). It is difficult to understand why the cost went up so drastically, while it dropped just as suddenly towards 2010 (2008: 1272100, 2009: 13181300, 2010: 1330600). The drastic increase in cost affected the HCROI value negatively to end with -16.16. The only possible explanation could be economic hardship that forced the cost up drastically for that specific sector, or that there was a huge expense such as a lawsuit, or really expensive machinery that had to be replaced.

The last year under discussion for highlighting outliers, is 2010. Two companies are discussed. The one company had a negative HCROI value of -8.89 and the other a higher positive HCROI value of 27.30, although this is not as high as shown in previous discussions. The observation starts from the positive value of 27.30, which was the value of a small mining company. It is evident that this company only started in 2008 because there are no values for 2006 and 2007. Pay and benefits and income (Pay &

Benefits: 1 856, Income: 8 518) are more or less on the same level on the graph (Figure 4.20 in Appendix H), although, according to the real figures, income was a few million higher, while cost was much higher (162 919). Cost and turnover went down during 2010 (cost 2009: 184 832, cost 2010: 162 919, turnover 2009: 254 899, turnover 2010: 211 714) while the loss decreased slightly from 2009 on (2009: -99544, 2010: -61544). The high turnover and low pay and benefits values may be the reason why the HCROI value was high.

The other company under discussion is the one with the low -8.89 HCROI value for 2010. It resorts under *Basic Resource-Industrial Metals & Mining* and is a small company. If the graph (Figure 4.21 in Appendix H) is examined, one notices that this company was run against a loss for 2010. To start, pay and benefits remained fairly constant from the previous years up till 2010 (13 069). The income, as well as the profit for this company went down drastically towards 2010 (Income: 2009 = 34 857, 2010 = -501 049, Profit: 2009 = -137 926, 2010 = -675 665), which means that the company has not performed well. For 2010, cost even increased above turnover (Cost = 807 004, Turnover = 677 732). For this company, 2010 was definitely not a good year, and this may explain why the HCROI for 2010 indicates a negative value.

This concludes the discussion on the extreme outliers indicated in the frequency tables for the different years. What can be gathered is that these companies seem to represent a very real sample of the population of listed companies, and that mere deletion of these extreme values upon the basis that it is highly unlikely that they were sampled from the same population (e.g., Tabachnick & Fidell, 2001), remains tenable.

In the present section, it has been shown that annual outliers affect the mean HCROI statistic, and that these extreme values seem to represent viable observations in the population of listed companies. The next discussion concerns the possible influence that company size had on human capital effectiveness in the present sample.

4.5 HCROI ratios and company size

Benchmarks are only useful if they allow for meaningful comparisons to ‘comparable other’ companies. One way to achieve this is by breaking down HCROI ratios in the present sample by company size. Since it is advisable for companies to also benchmark with regard to the size of the company, it is important to determine whether size has an effect on the HCROI ratio or not. Table 4.12 reports the descriptive statistics of HCROI by company size, across years, and these are graphically depicted in Figure 4.12.

Table 4.12

Descriptive statistics of HCROI for the different size companies

		HCROI				
Size		2006	2007	2008	2009	2010
Large	Mean (<i>M</i>)	59.806	3.920	8.728	3.874	4.045
	Median (<i>Mdn</i>)	3.507	3.663	4.143	3.481	3.366
	Std. Deviation (<i>SD</i>)	200.183	1.398	18.349	2.361	3.039
	<i>n</i>	17	17	18	19	19
Medium	Mean (<i>M</i>)	4.012	4.671	4.175	3.013	2.967
	Median (<i>Mdn</i>)	3.038	2.977	3.077	3.066	3.047
	Std. Deviation (<i>SD</i>)	4.112	8.532	4.748	1.343	1.089
	<i>n</i>	21	32	33	33	35
Small	Mean (<i>M</i>)	6.714	5.009	4.862	2.872	2.930
	Median (<i>Mdn</i>)	2.960	2.916	3.027	2.772	2.811
	Std. Deviation (<i>SD</i>)	12.094	7.925	7.988	2.597	2.781
	<i>n</i>	54	102	121	122	120
Total	Mean (<i>M</i>)	15.908	4.815	5.135	3.008	3.059
	Median (<i>Mdn</i>)	3.126	3.036	3.163	2.897	2.949
	Std. Deviation (<i>SD</i>)	87.049	7.593	9.168	2.393	2.576
	<i>n</i>	92	151	172	174	174

When the mean HCROI ratios are compared across years for the large group, there is a discrepancy because of the first value for 2006 (59.80), which is very high. The means for the medium-sized companies give a better impression; however they show a slight decline from 2006 to 2010 (4.01, 4.67, 4.17, 3.01 and 2.96). The means for the smaller companies also decline from 2006 to 2010, but this again is slightly higher than the means for the medium-sized companies (6.71, 5.00, 4.86, 2.87, and 2.93). The means for the medium-sized companies appear to be more consistent and nearer to the overall grand median of ± 3 that was calculated earlier. The fluctuations in the means may be caused by the outliers discussed earlier and are therefore not desirable for use as a benchmark by companies.

If the medians for the differently-sized groups are considered, those of the large group appear to be generally slightly higher than those of the other size groups. The reason for this may be that their profits and turnovers are much higher than those of the smaller and medium-sized companies. It is therefore important for companies to also benchmark themselves only within a group of companies of a similar size, where feasible.

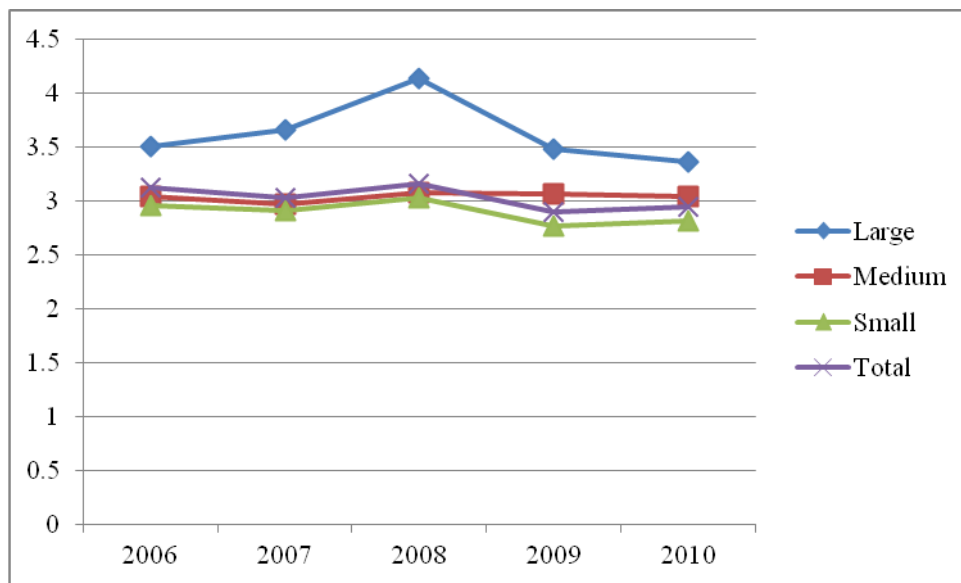


Figure 4.12. HCROI means (of medians) for the different size companies for the study period (2006 – 2010)

The standard deviation, again, is a measure of variability and shows how much dispersion there is in terms of HCROI ratios within each group size. The high standard deviation for large companies during 2006 ($SD = 200.18$) and during 2008 ($SD = 18.34$) means that the data points (HCROI ratios) are spread out over a large range of values. However, the lower standard deviation for years 2007 and 2009 and 2010 for large companies ($SD = 1.39, 2.36$ and 3.03 respectively) indicates that the data points are close to the mean. The latter three years for the large companies are therefore closer to the mean, which also links closer to the median ($Mdn = 3.03$), which indicates more consistency. If the standard deviation for the medium-sized companies is considered, the standard deviation for 2009 and 2010 ($SD = 1.34$ and 1.08 respectively) indicates that the data are closer to the mean, whereas it tends to be spread out over a larger range of values in the other years, it is not as high as with the large group, with the highest standard deviation being that of 2007 ($SD = 8.53$). Years 2006 and 2008 reveal lower standard deviations (2006: $SD = 4.11$, 2008: $SD = 4.74$).

To analyse these mean differences in HCROI across company size categories for statistical significance, ANOVA was conducted. Table 4.13 represents the results of ANOVA. HCROI differences across company size categories in 2006 were not significant, $F(2, 89) = 2.762, p > .069$ between size groups, although these were marginal (possibly due to the extreme value in 2006, discussed earlier). When the 2007 figures are studied, it leads to the same conclusion, namely $F(2, 148) = .155, p > .856$ and no significant variation between groups. The statistics for 2008 ($F(2, 169) = 1.629, p > .199$), 2009 ($F(2, 171) = 1.449, p > .238$) and 2010 ($F(2, 171) = 1.576, p > .210$) resemble this, with the conclusion that there is no significance difference in HCROI between companies of different size categories.

Table 4.13

Mean differences in HCROI across company size (ANOVA)

		HCROI				
		SS	df	MS	f	Sig.
2006 * Size	Between Groups (Combined)	40295.704	2	20147.852	2.762	.069
	Within Groups	649263.885	89	7295.100		
	Total	689559.590	91			
2007 * Size	Between Groups (Combined)	18.116	2	9.058	.155	.856
	Within Groups	8631.902	148	58.324		
	Total	8650.018	150			
2008 * Size	Between Groups (Combined)	271.835	2	135.917	1.629	.199
	Within Groups	14103.986	169	83.456		
	Total	14375.821	171			
2009 * Size	Between Groups (Combined)	16.512	2	8.256	1.449	.238
	Within Groups	974.401	171	5.698		
	Total	990.913	173			
2010 * Size	Between Groups (Combined)	20.748	2	10.374	1.573	.210
	Within Groups	1127.481	171	6.593		
	Total	1148.229	173			

Stated otherwise, the results depicted in Table 4.13 can thus be interpreted that size does not affect human capital effectiveness, as measured by HCROI. There are no statistically significant differences between the means of HCROI for the different company sizes, across the range of the full study period.

Table 4.13 was compiled to determine the effect size of these differences. The table shows that, during the year 2006 ($\eta^2 = .058$), 5.8% of the variance in HCROI was because of company size. In years 2008 to 2010, effect sizes were smaller (2008: $\eta^2 = .019$, 2009: $\eta^2 = .017$, $\eta^2 = .018$). Basically, around 2% of variance in HCROI was due to company size.

Table 4.14

Effect size of mean differences in HCROI between company size categories

HCROI		
	Eta	Eta Squared η^2
2006 * Size	.242	.058
2007 * Size	.046	.002
2008 * Size	.138	.019
2009 * Size	.129	.017
2010 * Size	.134	.018

4.6 Sectoral/Industry differences in HCROI

Industry sectors, *per se*, are listed and discussed in Chapter 3. Table 4,15 lists the descriptive statistics for HCROI across the different industry sectors studies in the present research. The first sector with a relatively high HCROI is the *Oil and Gas Producers* category ($M = 10.448$). A closer look at this sector shows that it obtained high HCROI means during 2006 and 2007 (2006 $M = 30.990$, 2007 $M = 26.024$), together with high medians for the same period (2006 $Mdn = 30.990$, 2007 $Mdn = 9.010$). The standard deviation for this same sector for the same two years (2006 and 2007) is also spread out over a relatively large range of values (2006 $SD = 35.138$, 2007 $SD = 33.677$). The second highest sector mean falls in the *Personal & Household Goods – Leisure Goods* category ($M = 11.247$). It is interesting that a high HCROI median value is indicated for the first four years of the sector (Mdn : 2006 = 14.866, 2007 = 14.026, 2008 = 13.970, 2009 = 9.786), but it also shows a very low frequency ($f = 2$) which must also be considered, because it is the very few companies falling into this sector. Two sectors also have HCROI median averages with slightly higher values of five ($M = 5.765$), one in the *Financial Services* sector, and the other in the *Telecommunications – Mobile* sector ($M = 5.075$).

Table 4.15

Descriptive statistics of HCROI for the different sectors (2006 – 2010)

Sector		HCROI 2006	HCROI 2007	HCROI 2008	HCROI 2009	HCROI 2010	HCROI <i>M</i>
AltX	Mean (<i>M</i>)		3.413	3.417	3.787	3.105	
	Median (<i>Mdn</i>)		3.413	3.417	3.787	3.105	3.431
	Std. Deviation (<i>SD</i>)		.	.052	.337	.070	
Automobiles & Parts	Mean (<i>M</i>)	2.010	1.709	1.509	1.278	1.421	
	Median (<i>Mdn</i>)	2.010	1.709	1.509	1.278	1.421	1.586
	Std. Deviation (<i>SD</i>)	.	.270	.413	.586	.755	
Basic Resource- Forestry&Paper	Mean (<i>M</i>)	2.621	2.999	3.218	2.699	3.007	
	Median (<i>Mdn</i>)	2.621	3.615	3.465	3.086	3.432	3.244
	Std. Deviation (<i>SD</i>)	1.463	1.066	.973	.938	.893	
Basic Resource-Ind Metal&Mining	Mean (<i>M</i>)	4.263	4.358	4.974	4.457	2.178	
	Median (<i>Mdn</i>)	4.416	3.926	3.658	2.409	1.851	3.252
	Std. Deviation (<i>SD</i>)	1.683	2.145	3.659	3.643	6.653	
Basic Resource-Mining	Mean (<i>M</i>)	7.956	6.696	11.022	2.279	3.477	
	Median (<i>Mdn</i>)	3.008	3.049	4.271	1.949	1.937	2.843
	Std. Deviation (<i>SD</i>)	15.125	12.050	20.530	2.190	5.338	
Chemicals	Mean (<i>M</i>)	2.488	2.870	3.373	3.363	3.085	
	Median (<i>Mdn</i>)	2.831	2.749	3.329	3.143	3.100	3.03
	Std. Deviation (<i>SD</i>)	.838	.505	.672	1.302	.288	
Construction&Materials	Mean (<i>M</i>)	2.772	3.084	7.240	2.555	2.312	
	Median (<i>Mdn</i>)	1.972	2.210	2.667	2.306	2.195	2.270
	Std. Deviation (<i>SD</i>)	1.471	2.446	12.5111	.781	.620	
Financial Services	Mean (<i>M</i>)	3.992	18.436	2.558	1.822	2.016	
	Median (<i>Mdn</i>)	3.992	18.436	2.558	1.822	2.016	5.765

Sector		HCROI 2006	HCROI 2007	HCROI 2008	HCROI 2009	HCROI 2010	HCROI <i>M</i>
	Std. Deviation (<i>SD</i>)	.	21.048	1.053	.042	.140	
Food&Beverage- Beverages	Mean (<i>M</i>)	4.029	4.366	5.416	4.749	3.383	
	Median (<i>Mdn</i>)	4.029	4.366	5.416	4.749	3.383	4.389
	Std. Deviation (<i>SD</i>)	.	.	.954	.143	1.630	
Food&Beverage-Food Producers	Mean (<i>M</i>)	3.410	3.109	2.914	3.164	3.242	
	Median (<i>Mdn</i>)	3.503	2.930	2.997	3.123	3.138	3.138
	Std. Deviation (<i>SD</i>)	.389	.751	.615	.720	1.235	
Health Care- Equipment&Services	Mean (<i>M</i>)	2.318	2.286	2.210	2.147	2.183	
	Median (<i>Mdn</i>)	2.318	2.286	2.210	2.147	2.183	2.229
	Std. Deviation (<i>SD</i>)	.	.070	.110	.153	.122	
Health Care- Pharmaceutical&Biotechn ol	Mean (<i>M</i>)	4.591	8.689	4.315	4.523	4.393	
	Median (<i>Mdn</i>)	4.591	4.749	4.221	4.762	4.090	4.483
	Std. Deviation (<i>SD</i>)	.596	7.205	1.177	1.080	.903	
Ind Goods&Services- Electronic&Electr Equip	Mean (<i>M</i>)	2.639	2.887	4.063	3.258	2.881	
	Median (<i>Mdn</i>)	2.455	2.911	3.489	2.941	2.912	2.941
	Std. Deviation (<i>SD</i>)	.674	1.342	2.317	1.401	1.020	
Ind Goods&Services- General Industrials	Mean (<i>M</i>)	2.786	2.694	2.594	2.435	2.688	
	Median (<i>Mdn</i>)	2.786	2.553	2.791	2.485	2.659	2.655
	Std. Deviation (<i>SD</i>)	.356	.448	.662	.511	.789	
Ind Goods&Services- Industr Engineering	Mean (<i>M</i>)	2.645	3.712	2.537	2.323	2.192	
	Median (<i>Mdn</i>)	2.510	3.074	2.718	2.164	2.294	2.552
	Std. Deviation (<i>SD</i>)	.245	1.804	.859	.874	1.005	
Ind Goods&Services- Industr Transport	Mean (<i>M</i>)	4.717	4.144	3.771	3.679	3.154	
	Median (<i>Mdn</i>)	4.717	3.604	2.837	3.718	3.147	3.605
	Std. Deviation (<i>SD</i>)	2.006	2.185	2.768	2.099	1.395	

Sector		HCROI 2006	HCROI 2007	HCROI 2008	HCROI 2009	HCROI 2010	HCROI <i>M</i>
Ind Goods&Services- Support Services	Mean (<i>M</i>)	6.091	2.607	2.802	2.701	2.693	
	Median (<i>Mdn</i>)	2.478	2.510	2.670	2.793	2.819	2.654
	Std. Deviation (<i>SD</i>)	11.477	.944	.834	.619	.547	
Investm Instruments- Equity Investm Instruments	Mean (<i>M</i>)	3.535	3.029	2.743	2.325	5.005	
	Median (<i>Mdn</i>)	3.535	3.029	2.743	2.325	5.005	3.327
	Std. Deviation (<i>SD</i>)	2.167	1.282	.929	.828	.	
Media	Mean (<i>M</i>)		3.642	3.976	3.093	3.038	
	Median (<i>Mdn</i>)		3.642	3.976	3.282	3.274	3.544
	Std. Deviation (<i>SD</i>)		.374	.	.526	.490	
Oil&Gas Producers	Mean (<i>M</i>)	30.990	26.024	6.859	4.886	5.335	
	Median (<i>Mdn</i>)	30.990	9.010	4.803	3.807	3.631	10.448
	Std. Deviation (<i>SD</i>)	35.138	33.677	5.479	4.361	3.113	
Personal&Household Goods-Household Goods&Home Construct	Mean (<i>M</i>)	2.800	2.719	3.058	3.076	3.056	
	Median (<i>Mdn</i>)	2.800	2.719	3.058	3.076	3.056	2.942
	Std. Deviation (<i>SD</i>)	.	.	.	.	.
Personal&Household Goods-Leisure Goods	Mean (<i>M</i>)	14.866	14.026	13.970	9.786	3.590	
	Median (<i>Mdn</i>)	14.866	14.026	13.970	9.786	3.590	11.247
	Std. Deviation (<i>SD</i>)	14.132	13.035	14.790	10.197	.862	
Personal&Household Goods-Personal Goods	Mean (<i>M</i>)		2.820	2.859	2.791	2.637	
	Median (<i>Mdn</i>)		2.820	2.859	2.791	2.637	2.777
	Std. Deviation (<i>SD</i>)		1.516	1.706	1.789	1.396	
Real Estate- Investment&Services	Mean (<i>M</i>)	828.379	3.493	3.139	3.027	2.926	
	Median (<i>Mdn</i>)	828.379	3.493	3.139	3.027	2.926	168.193
	Std. Deviation (<i>SD</i>)	.	.	.	.	.
Retail-Food&Drug	Mean (<i>M</i>)	3.359	2.938	3.153	3.320	3.276	

Sector		HCROI 2006	HCROI 2007	HCROI 2008	HCROI 2009	HCROI 2010	HCROI <i>M</i>
Retailers	Median (<i>Mdn</i>)	3.288	2.795	3.077	3.354	3.176	3.138
	Std. Deviation (<i>SD</i>)	.359	.632	.455	.359	.318	
Retail-General Retailers	Mean (<i>M</i>)	18.983	4.128	4.236	2.425	3.931	
	Median (<i>Mdn</i>)	3.906	3.930	3.903	3.696	3.746	3.836
	Std. Deviation (<i>SD</i>)	42.511	1.107	.933	5.414	.809	
Technology- Software&Computer Services	Mean (<i>M</i>)	6.443	5.533	4.648	2.615	2.471	
	Median (<i>Mdn</i>)	3.216	2.577	2.715	2.612	2.522	2.728
	Std. Deviation (<i>SD</i>)	7.817	6.618	6.510	.733	.841	
Technology-Technology Hardware&Equipment	Mean (<i>M</i>)	3.866	3.788	3.654	3.513	3.183	
	Median (<i>Mdn</i>)	3.866	3.788	3.654	3.513	3.183	3.601
	Std. Deviation (<i>SD</i>)	1.088	1.148	.806	.512	.248	
Telecommunications- Mobile	Mean (<i>M</i>)			2.772	5.998	6.456	
	Median (<i>Mdn</i>)			2.772	5.998	6.456	5.075
	Std. Deviation (<i>SD</i>)			.	2.060	2.601	
Travel&Leisure	Mean (<i>M</i>)	10.021	5.552	5.270	3.213	2.852	
	Median (<i>Mdn</i>)	10.021	3.926	3.344	2.908	2.930	4.62
	Std. Deviation (<i>SD</i>)	4.398	3.866	5.059	1.081	1.207	
Total	Mean (<i>M</i>)	15.908	4.815	5.135	3.008	3.059	
	Median (<i>Mdn</i>)	3.126	3.036	3.163	2.897	2.949	3.034
	Std. Deviation (<i>SD</i>)	87.049	7.593	9.168	2.393	2.576	

Note. Values in ZAR ('000).

Sectors: *N* = 42

From the table provided above, it is evident that there appear to be consistent differences in human capital effectiveness, as measured by HCROI, across industries, and that these relative differences are maintained across years. The significance of these differences was not tested due to the high number of categories. This concludes the discussion on the HCROI values in the different sectors.

Since it has been shown that HCROI does not seem to vary across company size, but it does vary across industry sectors, the final portion of this chapter is devoted to international comparisons in human capital effectiveness.

4.7 International comparison of HCROI – SA, Europe, USA

To enable international comparisons with the PwC Saratoga benchmarks, the yearly averages of the medians for the different sectors in the South African sample of companies were calculated to obtain one grand HCROI median per sector over the five-year period (Table 4.16).

Since sector categories differ between the JSE and those from abroad, JSE sectors were divided to approximate the international categorisation used in the PwC Saratoga benchmark reports. With regard to the table, two sectors, namely *Technology Software & Computer Services and Technology – Technology Hardware & Equipment*, were selected for South Africa and the average of the median was calculated (all the medians were added and divided by $n = 10$) to obtain a grand median HCROI value for the *Technology* sector presented in Table 4.16. The South African sector *Health Care – Pharmaceutical & Biotechnology* values were taken for the ‘Pharma’ category. The same was done with regard to the *Engineering/manufacturing* field – the values for South Africa’s sector *Ind Goods & Services – Industr Engineering* were taken to represent this sector. Last, the values for sector *Travel & Leisure* were used for the *Retail and Leisure* in the column below.

When comparing human capital effectiveness (HCROI) between South African companies and those from the EU (Table 4.16) it is noted that HCROI for most sectors within the EU are in the vicinity of $HCROI \approx 1$, whereas those in South African sectors are not as consistent, but generally higher than in the EU. In the RSA column, the ‘*other finances, retail and leisure*’ and ‘*pharmaceuticals*’ sectors show higher HCROI than the grand median of $HCROI = 3$. These sectoral differences could be explained by general labour utilisation differences between sectors. However, these sectors (on average) receive more return on investment for every R1 they invest in personnel costs. The other sectors that are listed (*Media, Technology, Chemicals, Engineering*) show HCROI closer to the grand South African median of $HCROI \approx 3$.

Table 4.16

Comparison of HCROI for the EU and SA companies across sectors

Industry sector	HCROI	
	EU *	RSA
Banking	1.69	n/a
Other finance	1.19	5.77
Insurance	1.84	n/a
Comms/media	1.17	3.54
Technology	1.11	3.17
Pharma	1.31	4.48
Chemicals	1.42	3.03
Eng/Mfg	1.18	2.55
Utilities	1.35	n/a
Retail & leisure	1.15	4.63
Services	1.14	n/a
Public sector	n/a	n/a
Basic Resource –Mining	n/a	2.84

*Source: PwC Saratoga database

Table 4.17 displays a comparative analysis of HCROI in South African listed companies, as opposed to human capital effectiveness reported in other countries.

Table 4.17

International comparison of HCROI for the USA, Europe and SA (2006 – 2010)

	2004	2005	2006	2007	2008	2009	2010	% change 2006/7- 2008/9	% change 2007/8- 2008/9
Country									
UK	1.11	1.13	1.13	1.14	1.11	*	*	-2.1%	-2.8%
CEE Europe	1.11	1.23	1.25	1.22	1.57	*	*	25.4%	28.6%
Western Europe	1.14	1.16	1.17	1.18	1.16	*	*	-0.9%	-1.7%
All Europe	1.14	1.16	1.17	1.20	1.16	*	*	-0.6%	-2.6%
US	1.52	1.36	1.57	1.53	1.53	*	*	-2.5%	0.0%
South Africa	*	*	36.74	4.27	3.61	3.30	3.06	n/a [†]	-15.46%

Note. * No values available

[†] Score not calculated since median for 2006 excessively high due to outlier

Source of European values: PwC Saratoga database (for other countries)

What is clear from the information above is that all the ‘developed’ countries have a lower median HCROI ratio (between 1.11 and 1.57) than in South African listed companies (grand median HCROI of 3.03). South African companies showed a rather constant HCROI ratio from 2007 to 2010 (2007 $M = 4.27$, 2008 $M = 3.61$, 2009 $M = 3.30$ and 2010 $M = 3.06$). However, during 2006, the South African HCROI mean value was affected by an extreme outlier, but not in the other years.

This concludes the discussion of the results. While the initial expectation was that company size and sector would influence the HCROI values, it appears that company size does not affect human capital effectiveness as measured by HCROI. Substantial variations were observed across the respective sectors or industries within which companies resorted. Last, the results showed that the grand median HCROI for South African listed companies ($Mdn = 3.03$) was somewhat higher than those reported within the EU, USA and UK. A discussion of these results, concluding remarks and recommendations for future research follows.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

In Chapter 5, the aim and objective of the present study is highlighted, followed by a brief summary of the key findings, as reported in Chapter 4. Then, the bulk of this chapter is devoted to a discussion of the results of the study, integrated into prior literature. Last, limitations, conclusions and recommendations for practice and research are made.

5.1 Aim and objective of this study

Despite the availability of various measures of human capital effectiveness — such as human capital return-on-investment (HCROI) — users of these human capital metrics do not always have appropriate comparative benchmarks. Research on the central tendency and variability of HCROI in large companies is limited to proprietary reports, such as those published by the PWC Saratoga Institute in the USA. The aim of the current study was to describe the levels of human capital effectiveness, as indexed by HCROI, in South African listed companies. By extension, the results of the present study would provide general benchmarks for human capital effectiveness in the South African context, but would also allow users to make evaluative comparisons by industry, company size, and year. Aside from its practical relevance, the results of this research — at a theoretical level — explored the reasons for variability in HCROI.

South Africa is a developing country (Bureau of African Affairs, 2010) with a developing economy and relatively poor work force productivity (Schwab, 2010). It compares weakly against the developed world: SA falls in the lower salary category for minimum wage rates, when considering the 2010 statistics, such as % GDP per capita (Bureau of African Affairs, 2010). Not productivity levels only, but also its labour market efficiency (Schwab, 2010), are low when compared to the rest of the 133 countries included in the Global Competitiveness Index (2009-2010) Report. Notwithstanding, South Africa came to be included in the prestigious developing world BRIC-country block on April 13, 2011 (Kowitt, 2009), to form BRICS, and therefore became part of the “Big Five or Five States” (Radcliffe, 2011). To be included as one of the Big Five, a certain level of demonstrated economic development was required, of which human capital effectiveness most likely was considered — human capital effectiveness contributes to company growth and prosperity. No empirical research has systematically surveyed the levels of human capital

effectiveness in the South African context, as yet. Determining the levels of human capital effectiveness in South Africa therefore was deemed necessary.

In the present competitive environment, there is a clear need for human capital to be effective for the organisation to reach its financial goals and survive the future (Fitz-enz, 2010). Human capital effectiveness measures have value only if they serve as a comparative measure (Pearce & Robinson, 2005). The motivation for the present study was that industry benchmarks for HCROI could assist human resource managers to play a *strategic business partner* role, since industry benchmarks make HCROI ratio values inherently more meaningful — they allow for the interpretation of HCROI relative to those achieved by comparable other companies. In this way, HRM can be part of contributing to the growth of the company (Drucker, cited in Fitz-Enz, 2010) by enabling meaningful interpretation of companies' relative human capital effectiveness. Moreover, **accountability is more frequently demanded of the impact of human capital expenditure** (Chrysler-Fox, 2010). Adequate measurement plays an important part in demonstrating this accountability. Ulrich (1997, p. 303) supports this view by stating that “concepts need to be replaced with evidence, ideas with results, and perception with assessments”. The present study attempts to address these important calls, since industry benchmarks for HCROI could help empower HR managers and CEOs in SA companies to adequately quantify the contribution of human capital to the company's bottom line.

Another role that is increasingly required of HR managers lies in the development and implementation of *strategy*. HR managers are required to *predict the future*. Predicting the future can only be done with past results from measurements (Drucker, cited in Fitz-Enz, 2010). Measurement results inform management where the company is, and what they should change in order to survive the future. Unfortunately, not everyone knows precisely how to apply human capital metrics in terms of its influence, formulation and its implementation of the business strategy (Chrysler-Fox, 2010). Also, an absence of an appropriate level of decision making could prevent HR managers from providing appropriate human capital information (Chrysler-Fox, 2010).

Human capital measurement can also enable better *decision making*. Organisations must increasingly demonstrate that their human resource strategies enhance *competitive advantage*, requiring HRM to be a decision science that provides a logical, reliable and consistent framework which enhances decisions about key resources (Boudreau & Ramstad, 2002). The appropriate measurement and interpretation of human capital effectiveness indicators enables better HR decision making and contributes to the execution of HR strategies. It also provides evidence of human capital expenditure strategies.

Human capital measurement is necessary in order to determine *human capital effectiveness*. The science and practice of work and organisational (W&O) psychology rely on good measurement for guidance in many HR contexts, such as employee selection, classification and placement. Without sound measurement, our field cannot advance or provide a valued service to the business community (Aguinis, Henle & Ostroff, 2001). Against this backdrop, it is evident that an industry benchmark for human capital effectiveness could make measurement of human capital effectiveness more meaningful, since benchmark data almost serve as norms that allow a much richer interpretation of ‘raw’ scores (Nunnally, 1978).

Not all authors agree that HC benchmark data are useful, though. For instance, Huselid and Becker (2003) feel it is wrong for companies to rely on external benchmarks to measure HR performance, because it cannot measure the contribution of HR (performance) to the success of an organisation. Also, Singh and Latib (2005) do not favour human capital metrics in general because they feel it is widely misapplied in HR. Despite their hesitance, South African organisations still rely on external qualitative benchmarks for guidance in order to become world-class (Chrysler-Fox, 2010), although quantitative benchmarks are not yet available in the public domain. Benchmarking potentially holds advantages for SA human resource practitioners because it is a point of reference for measurements (Fitz-enz, 1992), such as measures of human capital effectiveness.

Having benchmarks of human capital effectiveness (such as HCROI) could allow companies to see to which degree they ‘measure up’ against comparable companies (i.e., norm group companies). National benchmarks would also facilitate international comparisons of relative human capital effectiveness. In a developing economy, human capital effectiveness benchmarks would serve a meaningful purpose since they may inform potential investors of a company’s sustainability, performance, and anticipated growth.

At theoretical level, the present research was deemed necessary because its descriptive results breaks ground for future explanatory research aimed at exploring factors associated with human capital effectiveness. In this way, it sets a ‘research agenda’ for future explanatory research concerning potential ‘causes and consequences’ of human capital effectiveness in companies.

For these reasons, and others, the aim of the present research study was to answer the basic research question, “**How** do *JSE listed companies in SA* perform with regard to *human capital effectiveness, as measured by human capital return-on-investment (HCROI)*, and how does this vary across industry sector, company size, and over time?”

The remainder of this chapter is devoted to answering this research question by means of a summary of the key research findings and the results of the study are integrated within the broader literature on human capital effectiveness. The chapter is closed with the conclusion, limitations and recommendations flowing from this research.

5.2 Summary of the key findings

The main objective of this research was to describe the levels of human capital effectiveness, as indexed by Fitz-enz's (2010) human capital return on investment (HCROI), of South African listed companies. A secondary aim was to determine how HCROI varied across industry sectors and company size, and how it fluctuated year-on-year. Last, at the national level, the results could allow inferences about South Africa's human capital effectiveness relative to other countries.

Overall, the average level of human capital effectiveness over the period covered in the present study (2006-2010) yielded a positive figure (average median HCROI = 3.03) with relatively small year-on-year variation ($SD = 0.11$). Since this figure is positive, it suggests that companies included in this study generated R3.03 in profit for every R1 spent on pay and benefits (Fitz-enz, 2010).

Inspection of the descriptive statistics revealed several outliers that disproportionately influenced the means of HCROI in some years (e.g., 2006), which suggests that companies that benchmark themselves against a larger sample should rather use the median HCROI, instead of the (sometimes) biased mean HCROI. The results clearly show that mean HCROI within any given year cannot to be considered a reliable benchmark, since outliers could drive the mean away from the median as an estimator of central tendency.

Despite their influence on parameter estimates like the mean, extremely high HCROI values — the situation of high profit figures being paired with low pay and benefit costs — also may indicate, but not necessarily implicate, possible human capital exploitation (e.g., low salaries or too few staff) (Huselid & Barnes, 2003), or an unexpected profit in a specific year. The same is applicable to extreme low and negative HCROI scores, which may implicate overinvestment in its human capital (Huselid & Barnes, 2003) leading to losses for the company. It may also merely reflect a very bad financial year for the company (or the industry overall, as witnessed in an economic downturn) resulting in pressure on the cost component of the HCROI-formula, such as an increase in production material cost. Finally, it may indicate that the structure of the workforce is not efficient or that the organisation has an inappropriate

product offering or pricing strategy (e.g., Scorecard Metrics for HR, 2009). Both extremely high and extremely low HCROI ratios are deemed to be indicators of practices or circumstances that are not sustainable in the long run, and should signal serious concern requiring immediate attention from users of such metrics.

Despite the positive central tendency and low dispersion of human capital effectiveness in the sample, various factors seemed to be related with HCROI. First, a temporal fluctuation in the HCROI *mean* over the five years (2006 – 2010) was quite apparent. In 2006, the mean HCROI was extremely high, compared to the other years, to be followed by a drastic drop in 2007, and a slight increase, again, in 2008. The mean HCROI levels for 2009 and 2010 were basically on *par* with the overall grand mean of the median. These results suggest that normal economic cycles, as expected, seem to affect the profitability of companies from year to year, which shows in the resultant human capital effectiveness measure. Users of human capital metrics should, therefore, interpret HCROI against the backdrop of cyclical influences that may uniformly affect competitor companies. The results also show that not only the central tendency of human capital effectiveness varies across years, but also the relative dispersion across years. In some years, there is less variability in human capital effectiveness, and in others more, which could indicate either the presence of outliers within a given year, or merely reflect the influence of economic cycles that suppress or support the profitability of companies in certain years. In 2006 for instance, it seems that relatively more companies showed very high levels of HCROI, reflected in extreme profit figures, which could indicate the prosperity of these companies prior to the ‘great recession’ witnessed from 2008 to 2010.

In the present study, HCROI was analysed, but the different *elements* used in the determination of HCROI, also deserve comment — these elements represent the direct ‘causes’ of human capital effectiveness as measured by HCROI. For instance, the median of the pay and benefits element appeared steadier than the others, with no initial change between 2006 and 2007 and, from there, a very slight but constant increase to 2010. The cost median reveals the same tendency, except that there was a drop in the median cost score between 2006 and 2007, then steady maintaining of that position to 2008, after which a slight (but more severe than with pay and benefits) increase into 2010. Turnover followed the cost trend, but the increase for 2009 to 2010 was steeper. A possible reason for cost medians increasing during the last four years may be higher costs of production and higher salaries (Saratoga HC Review, 2010).

Not only did HCROI vary year-on-year, but other factors seemed related to human capital effectiveness. When the HCROI ratios for the different *sectors* were calculated, the results showed that HCROI appears

to vary quite substantially across sectors. It is evident that there appear to be consistent differences in human capital effectiveness, as measured by HCROI, across industries, and that these relative differences are maintained across year. The significance of these differences was not tested due to the high number of categories.

A further, very interesting and unexpected discovery was that the *size* of a company also generally had no statistically significant influence on human capital effectiveness, except in one year of the study (2007). This finding contradicts the expectation that the size of the company would influence HCROI, since company size could reflect different stages of company growth and different business strategies, each of which would imply a specific pattern of pay and benefit expenditure in conjunction with costs and resultant profit.

Despite the finding that company size does not seem to affect human capital effectiveness, the results showed substantial international differences in human capital effectiveness. It must be pointed out that, since HCROI is essentially a ratio of profit generation from investment in human capital, it should not be influenced by currency differences, or other macro-economic factors. For the present study, the human capital effectiveness (HCROI) of SA companies was compared with a few developed countries. The results (Table 4.16) showed that — seen against the international market (mainly US and EU) covered by the Saratoga report (Phelps, 2010) — South African companies experienced generally higher levels of human capital effectiveness than US or EU companies. A sectoral comparison was also made across these samples.⁸ In the “other finance” sector, SA companies had the highest score relative to the other South African sectors. The highest HCROI median for the international sample was in the *insurance* sector, but there was not comparable sector in the SA sample. When the average South African human capital effectiveness index (HCROI) is compared to those of developed countries (USA and EU) South African companies performed quite favourably, contrary to expectations created by its relatively poor labour productivity (Schwab, 2010).

When SA was compared further to the international *countries* surveyed in the Saratoga reports (Schwab, 2010), the relative similarities of the other international countries’ HCROI scores was apparent — all had HCROI scores ranging from 1.11 to 1.57 over all the years (2004 – 2008). Perhaps HCROI is also a function of development status at a national level, i.e. countries that are broadly classified as developed

⁸ First, the international group had a sector for *banking* for which SA had no results. This is a separate sector to the *other finance* sector in which SA has a value. It will be interesting to know why SA does not have a value for banking, but that its banks resort under ‘other finance’.

would have human capital effectiveness indices that are relatively comparable, and the same within countries that are classified as developing.

This concludes the summary of the human capital effectiveness indicators (HCROI) that were observed in this research. Our next discussion attempts to integrate these results with the literature on human capital effectiveness, and, from this, draws conclusions about the findings.

5.3 Integration of study results and human capital effectiveness literature

It is often alleged that South African companies have poor labour force productivity (Schwab, 2010). One of the core objectives of the present study was to investigate the human capital effectiveness in SA companies listed on the JSE. Very little published information exists about the levels of human capital effectiveness, both internationally and locally. Hence, the present study addresses an important gap in the existing literature base regarding human capital measurement.

The broader literature often proclaims that “*people are our most important asset*” (Huselid & Barnes, 2003), and the human resource component remains one of the last avenues to exploit to enhance a company’s competitiveness. Unfortunately, the value of people (in other words, the asset of human capital) to the company has been experienced as a cost-item only, and not as one that generates profit. More recent research evidence (e.g., Crook, Todd, Combs, Woehr & Ketchen, 2011), however, shows that human capital effectiveness relates strongly to organisational performance.

In the present study, it is shown that South African companies have managed to obtain levels of human capital effectiveness that are generally higher than those reported in the US or the EU. In other words, SA companies have been able to generate more profit from human capital expenditure relative to its international peers. It also seemed that human capital effectiveness in some sectors was indexed as higher than others. Such differences could reflect substantively different abilities of these companies to manage their human capital in a way that optimised the generation of profit. Another reason for these differences is derived from talent cost differences within respective labour markets in certain sectors or countries. It is generally known that labour costs are lower in South Africa than in the developed world, which results in higher HCROI ratios.

Apart from relative differences in *compensating* their labour forces differentially, as demonstrated in pay and benefit costs incorporated into the HCROI formula, the underlying challenge remains for companies

to *manage* human capital better towards profit. The criterion for the success of a company is that investors recognise an opportunity to invest in a company to gain financial benefit from it. If a company gains a competitive advantage above others, it becomes more attractive as an investment destination, because investors seek to achieve the highest return from the investments they make. From the results obtained in this research, it could be speculated that SA companies due to relatively high human capital effectiveness could be a more attractive investment destination to foreign investors. This view is supported by Brand South Africa (undated), which stated that international companies gained much through investing in SA because of low labour costs and excellent infrastructure.

A more philosophical view of the study results is also possible. Smith (in Plowman & Perryer, 2010) noted that human capital is one of the means of production and that productive labour leads to an increase in goods. Unproductive labour does not add to wealth because its value is consumed as soon as it is created. Therefore, Smith says, if labour adds value, it is productive. This is precisely what human capital is supposed to do for a company – to add value through labour. Companies need to make use of human capital in exchange for something else – the need for financial gain. The present study benchmarked South African companies in terms of human capital effectiveness as measured by HCROI. In comparing these results to the international market, it does seem that SA companies are generally succeeding in adding value to the company by means of employing human capital efficiently. However, these results should be compared with findings from other developing world countries to determine whether HCROI differences reflect higher human capital effectiveness per se, or merely lower cost pressures due to lower labour cost inputs.

This concludes the integration of the results of the study with the broader literature on human capital effectiveness. Conclusions drawn from this integration and recommendations are followed by an outline of the study's limitations.

5.4 Recommendations

Various recommendations flow from the above discussion of the research results of this study. These are presented in three parts, namely general recommendations regarding the use of HCROI benchmarks to assess human capital effectiveness, recommendations for practice, and recommendations regarding further research to be considered.

5.4.1 General recommendations regarding the use of HCROI benchmarks

This study calculated human capital return on investment (HCROI) ratios for a sample of companies using the general formula of Fitz-enz (2010). The purpose of the research was to establish a set of benchmark for South African companies that would allow for normative comparisons of calculated HCROI indices for a specific company. A number of recommendations regarding the use of HCROI as a measure of human capital effectiveness, as well as utilising the set of benchmarks developed in this study, are presented below.

- When describing the central tendency of HCROI in the present study, it was found that extreme HCROI values – outliers – influenced the mean of these values within sectors or company size categories, disproportionately (cf. Figure 5.1). It is suggested that, when using benchmarks of HCROI, users should rather opt to utilise the median of HCROI within a comparison group, and not the mean, since the mean is more easily biased by extreme values (Tabachnick & Fidell, 2001).

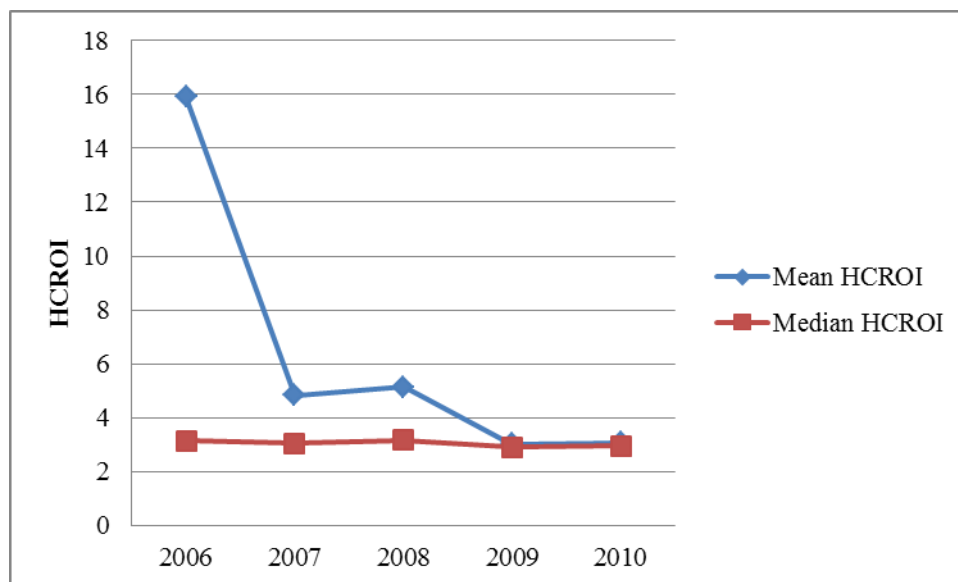


Figure 5.1. Graph differentiating the HCROI mean and median over the study period (2006 - 2010)

- In the present sample that was surveyed, it appeared that the grand median of HCROI ratios across JSE listed companies (over the study period 2006 – 2010) was positive, and was calculated as $HCROI_{GMdn} = 3.03$. For the purpose of making general normative comparisons, companies may use this ratio (*M of Mdn*: 3.03) as a general benchmark for human capital effectiveness. Stated otherwise, South African listed companies, on average, generated R3.03 in profit for every R1 spent on employee remuneration costs.
- For more specific comparisons of human capital effectiveness, companies may use the median HCROI ratios listed within normative group comparison tables — either by sector/industry, company size, or both — as listed in the norm tables provided in Chapter 4 and in the appendices to this thesis. To allow for meaningful comparisons, it is recommended that users choose normative groups that most closely resemble the specific characteristics of the user's company. Where such normative comparison groups are relatively small, or where a clear match with a normative group is not possible, users should either utilise the grand median HCROI (3.03), or interpret comparison group median HCROI results with caution. Users should also consider the relative dispersion (*SD*) of HCROI within the relevant normative group. Last, users should be aware that HCROI may be subject to fluctuations dependent on the economic cycle.
- Users of these benchmarks should be aware of the fact that HCROI is a lagging indicator of human capital effectiveness, and therefore reflect human resource management inputs delivered over a longer period of time. Therefore, when assessing the impact of human resource interventions or strategies on year-on-year growth in HCROI, users should take a longer timeframe in mind than only the most recent year of assessment.
- Since HCROI is a very coarse indicator of human capital effectiveness, it also masks the substantial complexity underlying the resultant HCROI ratio. In it, a multitude of influences affect both income, cost, profit and also employee compensation costs, many of which fall outside of the scope of control of the human resource manager. For this reason, users of this, and similar metrics, should not oversimplify the chain of causality that leads to human capital effectiveness as indicated by HCROI. Rather, it should lead users to consider how they could affect, through appropriate human resource interventions, increases in profit, lowering of cost, and more effective compensation strategy and implementation.

5.4.2 *Recommendations for practice*

Human resource managers have traditionally struggled to quantify the contribution of human resources and human resource management to important business outcomes, like profit (Fitz-enz, 2010), which has impeded the strategic role that HR managers play in their management teams. The present study strongly recommends the increased use of human capital metrics such as HCROI as strategic management tools, to be used by either HR functionaries, line management, or both. The following specific recommendations regarding the present study are therefore submitted to help HR managers and practitioners fulfil their role as strategic partner:

- A first recommendation is that HCROI ratios, as indicators of broad human capital effectiveness, should strongly feature on balance score cards (Kaplan & Norton, 1996) and HR score cards (Huselid & Barnes, 2003) as key performance indicators, because it focuses the attention of the company on factors that will maximise profit through meaningful employment of human capital.
- Second, companies should, especially in cases where HCROI ratios are low, guard against over-investing in its human capital (Bontis & Fitz-enz, 2002) so that the company runs against a loss – although there may be many factors that may also induce low HCROI, like economic downturns, sharp rises in production costs, inefficient workforce structures, or inappropriate product or service offerings.
- Third, companies should also guard against exploiting their people (depletion) (Bontis & Fitz-enz, 2002). This may be reflected through exceedingly high HCROI ratios – or it may be due to rapid unexpected growth during a specific year. Companies should strive to maintain an optimum balance between the profit motive, social responsibility to their employee force through reasonable and fair compensation, and long term sustainability.
- Fourth, using human capital metrics like HCROI is not only useful as indicators of effectiveness, but they encourage a strategic mindset. HR leaders that use HCROI as indicators of human capital effectiveness have the information to inform top management of impact of human capital on the bottom line of the business. As a decision-science (Cascio & Boudreau, 2008), HR should consider the impact of all HR and non-HR decisions on human capital effectiveness. In doing so, HR leaders can fulfil their rightful strategic role of informing and advising their executive teams. For instance, when considering market pay decisions, a HCROI mindset would encourage the thoughtful consideration of the trade-off between remaining competitive as an employer brand (labour market competitiveness) through providing reasonable pay, but without affect product market competition adversely by inflating product costs through the labour cost element.

- Fifth, companies should routinely calculate their HCROI ratios (as indicated in Chapters 3 and 4) report these results in their annual financial reports. In other words, human capital reporting should become an industry standard for sound corporate governance and accounting.
- Sixth, listed companies are encouraged to include all necessary values for calculating HCROI, and other human capital metrics, in their Annual Reports and integrated reports (South African Institute of Chartered Accountants, 2010).
- Last, human capital metrics have contributed much to support strategic decision-making (Chen & Lin, 2004), but a critical problem was presented through a lack of interpretation guidelines for HCROI, i.e., up to now, users of these metrics have not been able to indicate whether their HCROI was a high or a low HCROI ratio, aside from ipsative self-to-self comparisons). The present study addressed this gap and provides benchmark scores for HCROI in SA and for SA companies. It is hoped that HR managers will embrace human capital measurement as a means to (1) demonstrate their impact to important business outcomes, (2) use these measures as decision-aids for all strategic decisions, and (3) that managers will hold their HR representatives accountable on HCROI as key performance indicators of human resource management performance. Similar studies should also be undertaken internationally.

5.4.3 *Recommendations concerning further research*

Aside from practical recommendations, the present study also makes a number of recommendations for future research. This is the final contribution for this section. As with all descriptive research, the present study lays the groundwork for future research that develops questions about human capital effectiveness that are explanatory in nature. Further research may address unanswered questions or provide further evidence in support of the current research, as follows:

- A limitation of this study is that only large companies were researched — listing on a stock exchange carries with it certain requirements, which, on their part, bias the sample of organisations studied in the present research. In this way, the results of the present study cannot be generalised to unlisted companies. By extension, an investigation of human capital effectiveness (Carrell *et al.*, 1996) in smaller companies is recommended, to enable managers of smaller companies to assess relative human capital effectiveness to fulfil their role as strategic partners in reporting to management (Cummings & Marcus, 1994).
- The present descriptive study opened a multitude of avenues for further research. Users may therefore wish to utilise HCROI ratios in such multivariate research where normality is an

assumption (Hair *et al.*, 2010). Since HCROI ratios are not normally distributed (Kurtosis: 2006 = 86.006, 2007 = 36.082, 2008 = 40.41, 2009 = 30.334, 2010 = 49.593) it is recommended that companies that wish to use HCROI ratios, for instance, in correlation or multiple regression analysis would have to first transform these scores to a normal distribution, or remedy this problem by other appropriate means (Tabachnik & Fidell, 2001). At the very least, this violation of the normality assumption should be acknowledged in the reporting of such results.

- Another fruitful line of research would involve case study research that seeks to identify human resource management practices that contrast best-in-class human capital effectiveness against worst-in-class performers.
- Another recommendation is that the measurement for HR metrics (Chen & Lin, 2004) and human capital effectiveness (Boudreau & Ramstad, 2007) should receive more attention in the development and training of HR managers to equip them more to take up their strategic roles (Cummings & Marcus, 1994; Pietersen & Engelbrecht, 2005) in the company.
- Another important recommendation is that, instead of using only HR remuneration values in HCROI, the *total cost of human capital management* should be incorporated in measures of human capital effectiveness. The formula suggested by Fitz-enz (2010) utilises compensation costs only. A revised, or new HCROI formula, should incorporate the total cost of human capital – pay and benefits, other HR costs (such as training, selection, recruitment) as well as time spent by line management on HR activities. It is suggested that the broader formula be termed human capital return-on-investment (HCROI) and the more narrow Fitz-enz formulation be termed human capital compensation return-on-investment (HCCROI).

This concludes the recommendations of the present study. Limitations experienced in this study are highlighted in section

5.5 Limitations of the Study

It is important to point out limitations experienced with the present study. The first is that only large companies were included in the sample, due to the requirement that a company has to be of a certain size to be listed on the JSE. There is also a need for *smaller* companies to know the effect of people on the bottom line. The present study could be fruitfully replicated in a sample of small to medium sized enterprises (SMMEs).

A limitation flowing from the above is that all other smaller, medium or unlisted companies were excluded from the research, therefore results cannot be generalised to small and medium, or unlisted, companies.

The richness of findings from this descriptive study was limited by the available information that could be gleaned from financial data from *McGregor BFA* (2010) and other available company information (e.g., sector, size). It would have benefited this research if, for example, HR practices utilised in each company, as well as other HR budget item expenditure (e.g., training, selection) could have been measured.

5.6 Conclusions

Before this research commenced, normative comparisons of human capital effectiveness (HCROI) were not possible to most users of these metrics. The present study described the levels of human capital effectiveness, as measured by human capital return-on-investment (HCROI)(Fitz-enz, 2010), in a sample of listed companies in South Africa. It was found that the grand median HCROI was 3.03:1, i.e., these companies generated, on average, R3.03 of profit for every R1 expenditure on compensation costs.

Despite the fact that there is a general belief that the South African labour force remains relatively unproductive (Schwab, 2010), the results of the present study show that, at a company level, South African companies generally outperform their international counterparts in their ability to leverage profit from money spent on compensation. The role that unequal labour costs play in the developed vs developing worlds in resultant HCROI indices remains uncertain, however. If it is found, through subsequent research, that high levels of HCROI are indeed desirable since they are related to other important outcomes. South African companies' HR competitiveness could attract investors to SA.

Given the study findings, it could be beneficial for companies to report their HCROI ratios, like other investment quality indicators, against industry standards in their Annual Reports. These practices should be encouraged by corporate governance guidelines, financial reporting guidelines, accounting standards. The King III report recommends that companies create sustainability reports according to the guidelines of the Global Reporting Initiative's Sustainability Reporting Guidelines. In addition, the King Code of Governance (King III) recommends that:

companies produce an integrated report (integrated report of a company's performance regarding financial and non-financial results) in place of an annual financial report and

sustainability report. This requirement was implemented ahead of any formal or legal standards for an integrated report within South Africa and globally. (South African Institute of Chartered Accountants, 2010, p. 1)

The question remains whether it is worthwhile for companies to assess and monitor their human capital effectiveness as indicated by the HCROI ratio. Since these are such course indicators, do they say anything useful about human resource management and human capital quality? Other questions also remain. What would be the optimal level of HCROI be, given a company's strategy, growth stage and field of business? Also, at which level would a company be profitable and still be sustainable? Where would the margins of sound and ethical business practice be — at the low end of HCROI, at risk of labour action due to unfair remuneration practices, and at the top, having to close down because it is not profitable enough. For instance, some scholars (e.g., Jon, 2010) have accused Chinese companies, broadly speaking, of just demanding profit without care for their employees? What ethical questions will arise from such strategic HR decisions? The professions of Industrial Psychology and HRM have to balance the need for profit with the need of employees and their rights *not* to be misused and to receive an honourable wage for their labour. These questions may also provide grounds for further research.

At a more pragmatic level, other unanswered questions remain. Assume that, for example, two companies offer the same total compensation to its labour force, but that the *application* of that spending through judicious HR practices may be better in company B, and therefore result in higher profit. Having described the relative levels of HCROI in the sample studied in the present research, there is still no answer to what these critical factors are that allows one company to leverage more profit from the same remuneration expenditure.

In conclusion, the present research addressed the following research question:

How do *JSE listed companies in SA differ with regard to human capital effectiveness, as measured by human capital return-on-investment (HCROI)?*

By developing South African benchmarks for human capital return on investment (HCROI), the present study practically assists human resource management specialists to interpret their levels of human capital effectiveness by enabling normative comparisons with other companies with similar characteristics. The study also raises important questions about human capital measurement and develops a research agenda for future human capital measurement research.

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APPENDICES

APPENDIX: A - LARGE

List of Large-sized companies according to *ShareData Online (2011)* ($n = 40$ for both *ShareData* and *MGBFA*)

JSE LISTED COMPANIES - LARGE

Company	Code
British American Tobacco Plc	BTI
BHP Billiton Plc	BIL
Anglo American Plc	AGL
SAB Miller Plc	SAB
MTN Group Ltd	MTN
Sasol Ltd	SOL
Anglo Platinum Ltd	AMS
Standard Bank Group Ltd	SBK
Compagnie Financière Richemont SA	CFR
Naspers Ltd	NPN
FirstRand Ltd	FSR
AngloGoldAshanti Ltd	ANG
Impala Platinum Holdings Ltd	IMP
Kumba Iron Ore Ltd	KIO
Vodacom Group Ltd	VOD
Absa Group Ltd	ASA
Old Mutual Plc	OML
Gold Fields Ltd	GFI
Nedbank Group Ltd	NED

Company	Code
Shoprite Holdings Ltd	SHP
Sanlam Ltd	SLM
Remgro Ltd	REM
The Bidvest Group Ltd	BVT
Exxaro Resources Ltd	EXX
RMB Holdings Ltd	RMH
Aspen Pharmacare Holdings Ltd	APN
Lonmin Plc	LON
ArcelorMittal South Africa Ltd	ACL
Tiger Brands Ltd	TBS
African Rainbow Minerals Ltd	ARI
Harmony Gold Mining Company Ltd	HAR
Investec Plc	INP
Steinhoff International Holdings Ltd	SHF
Truworths International Ltd	TRU
African Bank Investments Ltd	ABL
Growthpoint Properties Ltd	GRT
Massmart Holdings Ltd	MSM
Capital Shopping Centres Group PLC	CSO
Reinet Investments SCA	REI
Dimension Data Holdings Plc	DDT

APPENDIX: B - MEDIUM

List of medium-sized companies according to *ShareData Online (2011)*($n = 100$, MGBFA: $n = 60$)

JSE LISTED COMPANIES - MEDIUM

Company	Code
Imperial Holdings Ltd	IPL
Woolworths Holdings Ltd	WHL
Discovery Holdings Ltd	DSY
Pick 'n Pay Stores Ltd	PIK
Redefine Properties Ltd	RDF
Netcare Ltd	NTC
Liberty Holdings Ltd	LBH
Mondi Plc	MNP
Assore Ltd	ASR
Sappi Ltd	SAP
Investec Ltd	INL
Foshini Ltd	FOS
Telkom SA Ltd	TKG
Pretoria Portland Cement Company Ltd	PPC
Medi-Clinic Corporation Ltd	MDC
Northam Platinum Ltd	NHM
Aquarius Platinum Ltd	AQP
Aveng Ltd	AEG
The SPAR Group Ltd	SPP
Santam Ltd	SNT
Uranium One Inc	UUU

Company	Code
Life Healthcare Group Holdings Ltd	LHC
Distell Group Ltd	DST
Murray & Roberts Holdings Ltd	MUR
Mr Price Group Ltd	MPC
Nampak Ltd	NPK
Reunert Ltd	RLO
Capitec Bank Holdings Ltd	CPI
Illovo Sugar Ltd	ILV
Clicks Group Ltd	CLS
Adcock Ingram Holdings Ltd	AIP
Tongaat Hulett Ltd	TON
Sun International Ltd	SUI
Hosken Consolidated Investments Ltd	HCI
Barloworld Ltd	BAW
Pick n Pay Holdings Ltd	PWK
Mvelaphanda Resources Ltd	MVL
Metropolitan Holdings Ltd	MET
AVI Ltd	AVI
Pioneer Food Group Ltd	PFG
Capital & Counties Properties PLC	CCO
Allied Electronics Corporation Ltd	ATN
Hyprop Investments Ltd	HYP
AECI Ltd	AFE
Pangbourne Properties Ltd	PAP
Mondi Ltd	MND

Company	Code
Grindrod Ltd	GND
Evraz Highveld Steel and Vanadium Ltd	EHS
Resilient Property Income Fund Ltd	RES
JD Group Ltd	JDG
Wilson Bayly Holmes – Ovcon Ltd	WBO
African Oxygen Ltd	AFX
PSG Group Ltd	PSG
Emira Property Fund	EMI
Trencor Ltd	TRE
Fountainhead Property Trust	FPT
Allied Technologies Ltd	ALT
SA Corporate Real Estate Fund	SAC
Datatec Ltd	DTC
Caxton and CTP Publishers and Printers Ltd	CAT

APPENDIX: C - SMALL

List of small-sized companies according to *ShareData Online (2011)* ($n = 285$, *MGBFA*: $n = 219$)

JSE LISTED COMPANIES - SMALL

Company	Code
Optimum Coal Holdings Ltd	OPT
Lewis Group Ltd	LEW
Great Basin Gold Ltd	GBG
JSE Ltd	JSE
Eastern Platinum Ltd	EPS
Acucap Properties Ltd	ACP
Capital Property Fund Ltd	CPL
Oando Plc	OAD
Rainbow Chicken Ltd	RBW
Net 1 UEPS Technologies Inc	NT1
Gold Reef Resorts Ltd	NDF
Vukile Property Fund Ltd	VKE
Coal of Africa Ltd	CZA
Palabora Mining Company Ltd	PAM
Sycom Property Fund	SYC
Astral Foods Ltd	ARL
Platmin Ltd	PLN
Absa Bank Ltd	ABSP
Group Five Ltd	GRF
Coronation Fund Managers Ltd	CML
Blue Label Telecoms Ltd	BLU

Company	Code
Omnia Holdings Ltd	OMN
Raubex Group Ltd	RBX
Metorex ltd	MTX
Nedbank Ltd	NBKP
Oceana Group Ltd	OCE
Health Strategic Investments ltd	HIS
Italtile Ltd	ITE
Famous Brands Ltd	FBR
Capevin Investments ltd	CVI
City Lodge Hotels Ltd	CLH
Merafe Resources Ltd	MRF
Hulamin Ltd	HLM
Cipla Medpro South Africa Ltd	CMP
Fortress Income Fund Ltd	FFA
Mobile Industries Ltd	MOB
Ceramic Industries Ltd	CRM
Peregrine Holdings Ltd	PGR
Brait S.A.	BAT
Invicta Holdings Ltd	IVT
Eqstra Holdings Ltd	EQS
Clientèle Ltd	CLI
AFGRI Ltd	AFR
Hudaco Industries Ltd	HDC
Freeworld Coatings Ltd	FWD
ADvTECH Ltd	ADH

Company	Code
Premium Properties Ltd	PMM
Mvelaphanda Group Ltd	MVG
Zurich Insurance Company South Africa Ltd	ZSA
Avusa Ltd	AVU
Zeder Investments Ltd	ZED
Pallinghurst Resources Ltd	PGL
Super Group Ltd	SPG
Alexander Forbes Preference Share Investments Ltd	AFP
Redefine properties International Ltd	RIN
Stefanutti Stocks Holdings ltd	SSK
Distribution and Warehousing Network Ltd	DAW
New Europe Property Investments Plc	NEP
Cashbuild Ltd	CSB
Kagiso Media Ltd	KGM
Adcorp Holdings Ltd	ADR
Hospitality Property Fund Ltd	HPA
Witwatersrand Consolidated Gold Resources Ltd	WGR
Metair Investments Ltd	MTA
Octodec Investments Ltd	OCT
Gold One International Ltd	GDO
Investec Bank Ltd	INLP
Brimstone Investment Corporation Ltd	BRT
Business Connexion Group Ltd	BCX
Petmin Ltd	PET
Sentula Mining Ltd	SNU

Company	Code
Paladin Capital Ltd	PLD
Basil Read Holdings Ltd	BSR
Anooraq Resources Corporation	ARQ
Astrapak Ltd	APK
Sasfin Holdings Ltd	SFN
Spur Corporation Ltd	SUR
Combined Motor holdings Ltd	CMH
Wesizwe Platinum Ltd	WEZ
Pan African Resources PLC	PAN
DRDGOLD Ltd	DRD
First Uranium Corporation	FUM
Real Africa Holdings Ltd	RAH
York Timber Holdings Ltd	YRK
Simmer and Jack Mines Ltd	SIM
Grand parade Investments Ltd	GPL
Comair Ltd	COM
Iliad Africa ltd	ILA
EOH Holdings Ltd	EOH
Wilderness Holdings Ltd	WIL
MiX Telematics Ltd	MIX
Pinnacle Technology Holdings Ltd	PNC
KAP International Holdings Ltd	KAP
Jubilee Platinum Plc	JBL
Bell Equipment Ltd	BEL
Argent Industrial Ltd	ART

Company	Code
Cadiz Holdings Ltd	CDZ
Mercantile Bank Holdings Ltd	MTL
Datacentrix Holdings Ltd	DCT
Phumelela Gaming and Leisure Ltd	PHM
Metmar Ltd	MML
Value Group Ltd	VLE
Delta EMD Ltd	DTA
Gijima Group Ltd	GIJ
CIC Holdings Ltd	CCI
Keaton Energy Holdings Ltd	KEH
Digicore Holdings Ltd	DGC
Consolidated Infrastructure Group Ltd	CIL
Esorfranki Ltd	ESR
ARB Holdings Ltd	ARH
Firestone Energy Ltd	FSE
Howden Africa Holdings Ltd	HWN
Metrofile Holdings Ltd	MFL
ZCI Ltd	ZCI
Bowler Metcalf Ltd	BCF
Universal Industries Corporation Ltd	UNI
Village main Reef Gold Mining Co (1934) Ltd	VIL
Sephaku Holdings Ltd	SEP
Paracon Holdings Ltd	PCN
Crookes Brothers Ltd	CKS
Andulela Investment Holdings Ltd	AND

Company	Code
Nu-World Holdings Ltd	NWL
UCS Group Ltd	UCS
Ellies Holdings Ltd	ELI
BSI Steel Ltd	BSS
Country Bird Holdings Ltd	CBH
AfroCentric Investment Corporation Ltd	ACT
Afrimat Ltd	AFT
Kelly Group Ltd	KEL
RECM & Calibre Ltd	RACP
Barnard Jacobs Mellet Holdings Ltd	BJM
Oasis Crescent Property Fund	OAS
Randgold & Exploration Co Ltd	RNG
Vox Telecom Ltd	VOX
Seardel Investment Corporation Ltd	SER
ELB Group Ltd	ELR
Amalgamated Appliance Holdings Ltd	AMA
Glenrand MIB Ltd	GMB
Mustek Ltd	MST
Litha Healthcare Group Ltd	LHG
Cullinan Holdings Ltd	CUL
AG Industries LTD	AGI
Trans Hex Group Ltd	TSX
Chemical Specialities Ltd	CSP
Vunani Ltd	VUN
Tradehold Ltd	TDH

Company	Code
Transpaco Ltd	TPC
Buildmax Ltd	BDM
Central Rand Gold Ltd	CRD
African Media Entertainment Ltd	AME
SacOil Holdings Ltd	SCL
Absolute Holdings Ltd	ABO
Protech Khuthele Holdings Ltd	PKH
Masonite (Africa) Ltd	MAS
Ingenuity Property Investments Ltd	ING
B&W Instrumentation and Electrical Ltd	BWI
Sabvest Ltd	SBV
Erbacon Investment Holdings Ltd	ERB
South Ocean Holdings Ltd	SOH
ConvergeNet Holdings Ltd	CVN
Sovereign Food Investments Ltd	SOV
Interwaste Holdings Ltd	IWE
Huge Group Ltd	HUG
Rex Trueform Cloting Company Ltd	RTO
Austro Group Ltd	ASO
Quantum Property Group Ltd	QPG
Mazor Group Ltd	MZR
Efficient Financial Holdings Ltd	EFF
1time Holdings Ltd	1TM
SecureData Holdings Ltd	SDH
OneLogix Group Ltd	OLG

Company	Code
Lonrho Plc	LAF
MAS Plc	MSP
Hwange Colliery Company Ltd	HWA
a.b.e. Construction Chemicals Ltd	ABU
Excellerate Holdings Ltd	EXL
Cargo Carriers Ltd	CRG
Sanyati Holdings Ltd	SAN
Rockwell Diamonds Inc	RDI
Miranda Mineral Holdings Ltd	MMH
O-line Holdings Ltd	OLI
Trustco Group Holdings Ltd	TTO
Wescoal Holdings Ltd	WSL
Marshall Monteagle Holdings Société Anonyme	MTE
Winhold Ltd	WNH
Putprop Ltd	PPR
Jasco Electronics Holdings Ltd	JSC
Trematon Capital Investments Ltd	TMT
Conduit Capital Ltd	CND
IFA Hotels & Resorts Ltd	IFH
Sable Holdings Ltd	SBL
Sekunjalo Investments Ltd	SKJ
African Eagle Resources Plc	AEA
Dorbyl Ltd	DLV
Rolfes Technology Holdings Ltd	RLF
Pinnacle Point Group Ltd	PNG

Company	Code
Labat Africa Ltd	LAB
DiamondCorp Plc	DMC
Purple Capital ltd	PPE
MICROmega Holdings Ltd	MMG
Verimark Holdings Ltd	VMK
Insimbi Refractory and Alloy Supplies Ltd	ISB
Orion Real Estate Ltd	ORE
Control Instruments Group Ltd	CNL
Africa Cellular Towers Ltd	ATR
Foneworx Holdings Ltd	FWX
Compu-Clearing Outsourcing Ltd	CCL
Amalgamated Electronic Corporation Ltd	AER
IPSA Group Plc	IPS
African and Overseas Enterprises Ltd	AOO
Ububele Holdings Ltd	UBU
Workforce Holdings Ltd	WKF
Cape Empowerment Ltd	CAP
Taste Holdings Ltd	TAS
ISA Holdings Ltd	ISA
Infrasors Holdings Ltd	IRA
Beige Holdings Ltd	BEG
Simeka Business Group Ltd	SBG
Fairvest property Holdings Ltd	FVT
Santova Logistics ltd	SNV
IQuad Group Ltd	IQG

Company	Code
Top Fix Holdings Ltd	TFX
William Tell Holdings Ltd	WTL
Blue Financial Services Ltd	BFS
Ideco Group Ltd	IDE
Gooderson Leisure Corporation Ltd	GDN
MoneyWeb Holdings Ltd	MNY
Brikor Ltd	BIK
Alert Steel Holdings Ltd	AET
The Don Group Ltd	DON
Finbond Group Ltd	FGL
White Water Resources Ltd	WWR
RACEC Group Ltd	RAC
KayDay group Ltd	KDV
SilverBridge Holdings Ltd	SVB
Sallies Ltd	SAL
Sea Kay Holdings Ltd	SKY
Accentuate Ltd	ACE
WG Wearne Ltd	WAE
London Finance & Investment Group PLC	LNF
TeleMasters Holdings Ltd	TLM
Merchant & Industrial Properties Ltd	MIP
PSV Holdings Ltd	PSV
Spescom Ltd	SPS
Calgro M3 Holdings Ltd	CGR
Primesery Group Ltd	PMV

Company	Code
Tawana Resources NL	TAW
Nictus Ltd	NCS
Adapt IT Holdings Ltd	ADI
Bonatla Property Holdings Ltd	BNT
RGT Smart Market Intelligence Ltd	RGT
African Dawn Capital Ltd	ADW
StratCorp Ltd	STA
Rare Holdings Ltd	RAR
Ansys Ltd	ANS
Spanjaard Ltd	SPA
Bicc Cafca Ltd	BIC
New Corpcapital Ltd	NCA
Wooltru Ltd	WLO
Colliers South Africa Holdings Ltd	COL
BioScience Brands Ltd	BIO
RBA Holdings Ltd	RBA
Intertrading Ltd	ITR
Imuniti Holdings Ltd	IMU
Kairos Industrial Holdings Ltd	KIR
Hardware Warehouse Ltd	HWW
John Daniel Holdings Ltd	JDH
Dialogue Group Holdings Ltd	DLG
Chrometco Ltd	CMO
Indequity Group Ltd	IDQ
Southern Electricity Company Ltd	SLO

Company	Code
Total Client Services Ltd	TCS
BRC DiamondCore Ltd	BCD
Skinwell Holdings Ltd	SKW
African Brick Centre Ltd	ABK
Poynting Holdings Ltd	POY
Zaptronix Ltd	ZPT
AH-Vest Ltd	AHL
Stella Vista Technologies Ltd	SLL
IFCA Technologies Ltd	IFC
Cenmag Holdings Ltd	CMG
SA French Ltd	SFH
Awethu Breweries Ltd	AWT
Foord Compass Ltd	FCPD
Resource Generation Ltd	RSG

APPENDIX: D – PERCENTILE SCORES FOR HCROI PER YEAR (2006 – 2010)**HCROI 2006****2006**

HCROI	<i>f</i>	<i>P</i>	<i>CUM- P</i>
.35	1	.3	1.1
1.01	1	.3	2.2
1.48	1	.3	3.3
1.53	1	.3	4.3
1.58	1	.3	5.4
1.59	1	.3	6.5
1.65	1	.3	7.6
1.66	1	.3	8.7
1.67	1	.3	9.8
1.67	1	.3	10.9
1.68	1	.3	12.0
1.84	1	.3	13.0
1.93	1	.3	14.1
1.97	1	.3	15.2
2.00	1	.3	16.3
2.01	1	.3	17.4
2.05	1	.3	18.5
2.12	1	.3	19.6
2.32	1	.3	20.7
2.34	1	.3	21.7
2.38	1	.3	22.8
2.39	1	.3	23.9
2.43	1	.3	25.0
2.46	1	.3	26.1
2.50	1	.3	27.2
2.50	1	.3	28.3
2.51	1	.3	29.3
2.51	1	.3	30.4
2.53	1	.3	31.5
2.53	1	.3	32.6
2.58	1	.3	33.7
2.60	1	.3	34.8
2.79	1	.3	35.9
2.80	1	.3	37.0

HCROI	<i>f</i>	<i>P</i>	<i>CUM- P</i>
2.81	1	.3	38.0
2.83	1	.3	39.1
2.85	1	.3	40.2
2.91	1	.3	41.3
2.93	1	.3	42.4
2.99	1	.3	43.5
3.02	1	.3	44.6
3.04	1	.3	45.7
3.04	1	.3	46.7
3.04	1	.3	47.8
3.10	1	.3	48.9
3.10	1	.3	50.0
3.15	1	.3	51.1
3.21	1	.3	52.2
3.21	1	.3	53.3
3.28	1	.3	54.3
3.29	1	.3	55.4
3.30	1	.3	56.5
3.40	1	.3	57.6
3.45	1	.3	58.7
3.50	1	.3	59.8
3.51	1	.3	60.9
3.60	1	.3	62.0
3.62	1	.3	63.0
3.63	1	.3	64.1
3.66	1	.3	65.2
3.75	1	.3	66.3
3.83	1	.3	67.4
3.85	1	.3	68.5
3.86	1	.3	69.6
3.98	1	.3	70.7
3.99	1	.3	71.7
4.03	1	.3	72.8
4.17	1	.3	73.9
4.42	1	.3	75.0
4.44	1	.3	76.1
4.64	1	.3	77.2
4.87	1	.3	78.3

HCROI	<i>f</i>	<i>P</i>	<i>CUM- P</i>
5.00	1	.3	79.3
5.01	1	.3	80.4
5.07	1	.3	81.5
5.16	1	.3	82.6
5.86	1	.3	83.7
6.14	1	.3	84.8
6.14	1	.3	85.9
6.60	1	.3	87.0
6.81	1	.3	88.0
6.91	1	.3	89.1
12.17	1	.3	90.2
13.13	1	.3	91.3
21.17	1	.3	92.4
21.92	1	.3	93.5
24.86	1	.3	94.6
38.71	1	.3	95.7
55.84	1	.3	96.7
61.27	1	.3	97.8
124.14	1	.3	98.9
828.38	1	.3	100.0
Total	92	28.8	
Missing	227	71.2	

Note. $N = 319$

HCROI 2007**2007**

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
.75	1	.3	.7
1.01	1	.3	1.3
1.19	1	.3	2.0
1.44	1	.3	2.6
1.52	1	.3	3.3
1.57	1	.3	4.0
1.64	1	.3	4.6
1.65	1	.3	5.3
1.66	1	.3	6.0
1.70	1	.3	6.6
1.73	1	.3	7.3
1.75	1	.3	7.9
1.77	1	.3	8.6
1.77	1	.3	9.3
1.77	1	.3	9.9
1.83	1	.3	10.6
1.86	1	.3	11.3
1.89	1	.3	11.9
1.90	1	.3	12.6
1.90	1	.3	13.2
1.91	1	.3	13.9
1.96	1	.3	14.6
2.03	1	.3	15.2
2.04	1	.3	15.9
2.09	1	.3	16.6
2.10	1	.3	17.2
2.12	1	.3	17.9
2.14	1	.3	18.5
2.18	1	.3	19.2
2.21	1	.3	19.9
2.24	1	.3	20.5
2.26	1	.3	21.2
2.27	1	.3	21.9

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
2.27	1	.3	22.5
2.28	1	.3	23.2
2.30	1	.3	23.8
2.33	1	.3	24.5
2.34	1	.3	25.2
2.35	1	.3	25.8
2.35	1	.3	26.5
2.36	1	.3	27.2
2.40	1	.3	27.8
2.40	1	.3	28.5
2.40	1	.3	29.1
2.45	1	.3	29.8
2.46	1	.3	30.5
2.46	1	.3	31.1
2.51	1	.3	31.8
2.51	1	.3	32.5
2.51	1	.3	33.1
2.53	1	.3	33.8
2.54	1	.3	34.4
2.55	1	.3	35.1
2.58	1	.3	35.8
2.60	1	.3	36.4
2.62	1	.3	37.1
2.66	1	.3	37.7
2.71	1	.3	38.4
2.72	1	.3	39.1
2.75	1	.3	39.7
2.79	1	.3	40.4
2.80	2	.6	41.7
2.80	1	.3	42.4
2.81	1	.3	43.0
2.82	1	.3	43.7
2.84	1	.3	44.4
2.90	1	.3	45.0
2.91	1	.3	45.7

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
2.91	1	.3	46.4
2.92	1	.3	47.0
2.92	1	.3	47.7
2.94	1	.3	48.3
2.98	1	.3	49.0
3.01	1	.3	49.7
3.04	1	.3	50.3
3.05	1	.3	51.0
3.07	1	.3	51.7
3.08	1	.3	52.3
3.10	1	.3	53.0
3.18	1	.3	53.6
3.21	1	.3	54.3
3.31	1	.3	55.0
3.36	1	.3	55.6
3.37	1	.3	56.3
3.38	1	.3	57.0
3.41	1	.3	57.6
3.43	1	.3	58.3
3.45	1	.3	58.9
3.46	1	.3	59.6
3.47	1	.3	60.3
3.49	1	.3	60.9
3.53	1	.3	61.6
3.55	1	.3	62.3
3.55	1	.3	62.9
3.57	1	.3	63.6
3.59	1	.3	64.2
3.60	1	.3	64.9
3.62	2	.6	66.2
3.63	1	.3	66.9
3.66	1	.3	67.5
3.67	1	.3	68.2
3.77	1	.3	68.9
3.83	1	.3	69.5

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
3.85	1	.3	70.2
3.89	1	.3	70.9
3.91	1	.3	71.5
3.92	1	.3	72.2
3.93	1	.3	72.8
3.94	1	.3	73.5
4.01	1	.3	74.2
4.09	1	.3	74.8
4.12	1	.3	75.5
4.15	1	.3	76.2
4.25	1	.3	76.8
4.28	1	.3	77.5
4.31	1	.3	78.1
4.35	1	.3	78.8
4.37	1	.3	79.5
4.44	1	.3	80.1
4.58	1	.3	80.8
4.60	1	.3	81.5
4.65	1	.3	82.1
4.71	1	.3	82.8
4.75	1	.3	83.4
4.81	1	.3	84.1
4.90	1	.3	84.8
5.01	1	.3	85.4
5.05	1	.3	86.1
5.27	1	.3	86.8
5.32	1	.3	87.4
5.34	1	.3	88.1
5.68	1	.3	88.7
6.11	1	.3	89.4
6.25	1	.3	90.1
6.55	1	.3	90.7
6.84	1	.3	91.4
7.17	1	.3	92.1
8.11	1	.3	92.7

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
9.01	1	.3	93.4
10.77	1	.3	94.0
10.79	1	.3	94.7
11.98	1	.3	95.4
17.01	1	.3	96.0
21.49	1	.3	96.7
23.24	1	.3	97.4
29.17	1	.3	98.0
33.32	1	.3	98.7
51.04	1	.3	99.3
64.81	1	.3	100.0
Total	151	47.3	
Missing	168	52.7	

Note. $N = 319$

HCROI 2008

2008

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
1.02	1	.3	.6
1.20	1	.3	1.2
1.22	1	.3	1.7
1.31	1	.3	2.3
1.35	1	.3	2.9
1.41	1	.3	3.5
1.46	1	.3	4.1
1.55	1	.3	4.7
1.57	1	.3	5.2
1.59	1	.3	5.8
1.60	1	.3	6.4
1.62	1	.3	7.0
1.63	1	.3	7.6
1.64	1	.3	8.1
1.65	1	.3	8.7
1.65	1	.3	9.3
1.78	1	.3	9.9
1.80	1	.3	10.5
1.81	1	.3	11.0
1.82	1	.3	11.6
1.83	1	.3	12.2
1.86	1	.3	12.8
1.89	1	.3	13.4
1.90	1	.3	14.0
1.92	1	.3	14.5
1.95	1	.3	15.1
2.01	1	.3	15.7
2.04	1	.3	16.3
2.04	1	.3	16.9
2.05	1	.3	17.4
2.07	1	.3	18.0

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
2.09	1	.3	18.6
2.13	1	.3	19.2
2.13	1	.3	19.8
2.27	1	.3	20.3
2.27	1	.3	20.9
2.28	1	.3	21.5
2.29	1	.3	22.1
2.33	1	.3	22.7
2.36	1	.3	23.3
2.44	1	.3	23.8
2.44	1	.3	24.4
2.47	1	.3	25.0
2.48	1	.3	25.6
2.49	1	.3	26.2
2.50	1	.3	26.7
2.50	1	.3	27.3
2.58	1	.3	27.9
2.61	1	.3	28.5
2.62	1	.3	29.1
2.64	1	.3	29.7
2.67	1	.3	30.2
2.70	1	.3	30.8
2.71	1	.3	31.4
2.72	1	.3	32.0
2.72	1	.3	32.6
2.73	1	.3	33.1
2.73	2	.6	34.3
2.74	1	.3	34.9
2.76	1	.3	35.5
2.77	1	.3	36.0
2.77	1	.3	36.6
2.81	1	.3	37.2
2.84	1	.3	37.8
2.85	1	.3	38.4
2.85	1	.3	39.0

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
2.85	1	.3	39.5
2.86	1	.3	40.1
2.86	1	.3	40.7
2.88	1	.3	41.3
2.89	1	.3	41.9
2.92	1	.3	42.4
2.92	1	.3	43.0
2.93	1	.3	43.6
2.94	1	.3	44.2
2.95	1	.3	44.8
3.00	1	.3	45.3
3.00	1	.3	45.9
3.02	1	.3	46.5
3.03	1	.3	47.1
3.03	1	.3	47.7
3.06	1	.3	48.3
3.08	1	.3	48.8
3.08	1	.3	49.4
3.14	1	.3	50.0
3.19	1	.3	50.6
3.20	1	.3	51.2
3.21	1	.3	51.7
3.22	1	.3	52.3
3.23	1	.3	52.9
3.28	1	.3	53.5
3.30	1	.3	54.1
3.33	1	.3	54.7
3.34	1	.3	55.2
3.37	1	.3	55.8
3.38	1	.3	56.4
3.38	1	.3	57.0
3.40	1	.3	57.6
3.40	1	.3	58.1
3.41	1	.3	58.7
3.45	1	.3	59.3

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
3.46	1	.3	59.9
3.47	2	.6	61.0
3.51	1	.3	61.6
3.51	1	.3	62.2
3.51	1	.3	62.8
3.51	1	.3	63.4
3.52	1	.3	64.0
3.54	1	.3	64.5
3.54	1	.3	65.1
3.54	1	.3	65.7
3.61	1	.3	66.3
3.66	1	.3	66.9
3.69	1	.3	67.4
3.72	1	.3	68.0
3.73	1	.3	68.6
3.74	1	.3	69.2
3.77	1	.3	69.8
3.80	1	.3	70.3
3.84	1	.3	70.9
3.86	1	.3	71.5
3.88	1	.3	72.1
3.97	1	.3	72.7
3.98	1	.3	73.3
4.04	1	.3	73.8
4.07	1	.3	74.4
4.10	1	.3	75.0
4.11	1	.3	75.6
4.13	1	.3	76.2
4.22	1	.3	76.7
4.22	1	.3	77.3
4.23	1	.3	77.9
4.27	1	.3	78.5
4.27	1	.3	79.1
4.34	1	.3	79.7
4.35	1	.3	80.2

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
4.38	1	.3	80.8
4.38	1	.3	81.4
4.43	1	.3	82.0
4.74	1	.3	82.6
4.79	1	.3	83.1
4.80	1	.3	83.7
4.95	1	.3	84.3
5.04	1	.3	84.9
5.25	1	.3	85.5
5.41	1	.3	86.0
5.48	1	.3	86.6
5.54	1	.3	87.2
5.78	1	.3	87.8
5.97	1	.3	88.4
6.09	1	.3	89.0
6.15	1	.3	89.5
6.26	1	.3	90.1
6.88	1	.3	90.7
7.08	1	.3	91.3
7.81	1	.3	91.9
7.92	1	.3	92.4
8.25	1	.3	93.0
8.70	1	.3	93.6
9.24	1	.3	94.2
12.78	1	.3	94.8
13.07	1	.3	95.3
14.15	1	.3	95.9
24.17	1	.3	96.5
24.43	1	.3	97.1
29.31	1	.3	97.7
36.80	1	.3	98.3
45.31	1	.3	98.8
64.33	1	.3	99.4
81.60	1	.3	100.0
Total	172	53.9	

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
Missing	147	46.1	

Note. $N = 319$

HCROI 2009

2009

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
-16.16	1	.3	.6
-.99	1	.3	1.1
-.01	1	.3	1.7
.12	1	.3	2.3
.49	1	.3	2.9
.65	1	.3	3.4
.86	1	.3	4.0
.95	1	.3	4.6
.99	1	.3	5.2
1.17	1	.3	5.7
1.21	1	.3	6.3
1.24	1	.3	6.9
1.24	1	.3	7.5
1.27	1	.3	8.0
1.32	1	.3	8.6
1.34	1	.3	9.2
1.46	1	.3	9.8
1.49	1	.3	10.3
1.53	1	.3	10.9
1.58	1	.3	11.5
1.62	1	.3	12.1
1.65	1	.3	12.6
1.69	1	.3	13.2
1.70	1	.3	13.8
1.71	1	.3	14.4
1.74	1	.3	14.9
1.78	1	.3	15.5
1.78	1	.3	16.1
1.79	1	.3	16.7
1.84	1	.3	17.2
1.85	1	.3	17.8

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
1.85	1	.3	18.4
1.87	1	.3	19.0
1.87	1	.3	19.5
1.88	1	.3	20.1
1.89	1	.3	20.7
1.93	1	.3	21.3
1.95	1	.3	21.8
1.97	1	.3	22.4
1.98	1	.3	23.0
2.01	1	.3	23.6
2.01	1	.3	24.1
2.03	1	.3	24.7
2.04	1	.3	25.3
2.05	1	.3	25.9
2.07	1	.3	26.4
2.14	1	.3	27.0
2.16	1	.3	27.6
2.19	1	.3	28.2
2.26	1	.3	28.7
2.28	1	.3	29.3
2.28	1	.3	29.9
2.31	1	.3	30.5
2.33	1	.3	31.0
2.38	1	.3	31.6
2.39	1	.3	32.2
2.41	1	.3	32.8
2.41	1	.3	33.3
2.42	1	.3	33.9
2.44	1	.3	34.5
2.46	1	.3	35.1
2.46	1	.3	35.6
2.50	1	.3	36.2
2.51	1	.3	36.8
2.51	1	.3	37.4
2.51	1	.3	37.9

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
2.53	1	.3	38.5
2.57	1	.3	39.1
2.57	1	.3	39.7
2.58	1	.3	40.2
2.60	1	.3	40.8
2.64	1	.3	41.4
2.64	1	.3	42.0
2.64	1	.3	42.5
2.65	1	.3	43.1
2.67	1	.3	43.7
2.71	1	.3	44.3
2.74	1	.3	44.8
2.74	1	.3	45.4
2.75	1	.3	46.0
2.79	1	.3	46.6
2.79	1	.3	47.1
2.84	1	.3	47.7
2.86	1	.3	48.3
2.87	1	.3	48.9
2.87	1	.3	49.4
2.89	1	.3	50.0
2.91	1	.3	50.6
2.91	1	.3	51.1
2.91	1	.3	51.7
2.93	1	.3	52.3
2.93	1	.3	52.9
2.95	1	.3	53.4
2.96	1	.3	54.0
2.96	1	.3	54.6
3.00	1	.3	55.2
3.00	1	.3	55.7
3.01	1	.3	56.3
3.01	1	.3	56.9
3.03	1	.3	57.5
3.03	1	.3	58.0

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
3.05	1	.3	58.6
3.07	1	.3	59.2
3.08	1	.3	59.8
3.13	1	.3	60.3
3.14	1	.3	60.9
3.15	1	.3	61.5
3.17	1	.3	62.1
3.19	1	.3	62.6
3.24	1	.3	63.2
3.25	1	.3	63.8
3.26	1	.3	64.4
3.28	1	.3	64.9
3.29	1	.3	65.5
3.30	2	.6	66.7
3.34	1	.3	67.2
3.35	1	.3	67.8
3.38	1	.3	68.4
3.38	1	.3	69.0
3.40	1	.3	69.5
3.44	1	.3	70.1
3.46	1	.3	70.7
3.46	1	.3	71.3
3.47	1	.3	71.8
3.48	1	.3	72.4
3.48	1	.3	73.0
3.50	1	.3	73.6
3.50	1	.3	74.1
3.55	1	.3	74.7
3.69	1	.3	75.3
3.70	1	.3	75.9
3.71	1	.3	76.4
3.71	1	.3	77.0
3.72	1	.3	77.6
3.75	1	.3	78.2
3.76	1	.3	78.7

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
3.81	1	.3	79.3
3.82	1	.3	79.9
3.84	1	.3	80.5
3.86	1	.3	81.0
3.86	1	.3	81.6
3.88	1	.3	82.2
3.90	1	.3	82.8
3.90	1	.3	83.3
3.91	1	.3	83.9
4.03	1	.3	84.5
4.06	1	.3	85.1
4.17	1	.3	85.6
4.22	1	.3	86.2
4.29	1	.3	86.8
4.37	1	.3	87.4
4.44	1	.3	87.9
4.46	1	.3	88.5
4.54	1	.3	89.1
4.65	1	.3	89.7
4.70	1	.3	90.2
4.80	1	.3	90.8
4.85	1	.3	91.4
4.87	1	.3	92.0
5.08	1	.3	92.5
5.18	1	.3	93.1
5.52	1	.3	93.7
5.57	1	.3	94.3
5.89	1	.3	94.8
5.94	1	.3	95.4
5.95	1	.3	96.0
6.56	1	.3	96.6
7.46	1	.3	97.1
8.08	1	.3	97.7
8.90	1	.3	98.3
9.69	1	.3	98.9

HCROI	<i>f</i>	<i>P</i>	<i>CUM-P</i>
11.08	1	.3	99.4
17.00	1	.3	100.0
Total	174	54.5	
Missing	145	45.5	

Note. $N = 319$

HCROI 2010**2010**

<i>HCROI</i>	<i>f</i>	<i>P</i>	<i>CUM-P</i>
-8.89	1	.3	.6
-2.00	1	.3	1.1
.65	1	.3	1.7
.89	1	.3	2.3
.98	1	.3	2.9
1.03	1	.3	3.4
1.04	1	.3	4.0
1.09	1	.3	4.6
1.10	1	.3	5.2
1.22	1	.3	5.7
1.36	1	.3	6.3
1.37	1	.3	6.9
1.39	1	.3	7.5
1.48	1	.3	8.0
1.53	1	.3	8.6
1.56	1	.3	9.2
1.59	1	.3	9.8
1.59	1	.3	10.3
1.62	1	.3	10.9
1.65	1	.3	11.5
1.65	1	.3	12.1
1.66	1	.3	12.6
1.67	1	.3	13.2
1.67	1	.3	13.8
1.71	1	.3	14.4
1.71	1	.3	14.9
1.72	1	.3	15.5
1.73	1	.3	16.1
1.77	1	.3	16.7
1.77	1	.3	17.2
1.80	1	.3	17.8

<i>HCROI</i>	<i>f</i>	<i>P</i>	<i>CUM-P</i>
1.82	1	.3	18.4
1.87	1	.3	19.0
1.87	1	.3	19.5
1.90	1	.3	20.1
1.90	1	.3	20.7
1.92	1	.3	21.3
1.94	1	.3	21.8
1.96	1	.3	22.4
1.97	1	.3	23.0
1.97	1	.3	23.6
1.98	1	.3	24.1
2.04	1	.3	24.7
2.09	1	.3	25.3
2.10	1	.3	25.9
2.11	1	.3	26.4
2.12	1	.3	27.0
2.12	1	.3	27.6
2.18	1	.3	28.2
2.20	1	.3	28.7
2.21	1	.3	29.3
2.23	1	.3	29.9
2.23	1	.3	30.5
2.23	1	.3	31.0
2.27	1	.3	31.6
2.29	1	.3	32.2
2.29	1	.3	32.8
2.31	1	.3	33.3
2.32	1	.3	33.9
2.37	1	.3	34.5
2.37	1	.3	35.1
2.38	1	.3	35.6
2.42	1	.3	36.2
2.44	1	.3	36.8
2.45	1	.3	37.4
2.47	1	.3	37.9

<i>HCROI</i>	<i>f</i>	<i>P</i>	<i>CUM-P</i>
2.48	1	.3	38.5
2.55	1	.3	39.1
2.56	1	.3	39.7
2.57	1	.3	40.2
2.58	1	.3	40.8
2.60	1	.3	41.4
2.62	1	.3	42.0
2.65	1	.3	42.5
2.66	1	.3	43.1
2.66	1	.3	43.7
2.77	1	.3	44.3
2.79	1	.3	44.8
2.80	1	.3	45.4
2.81	1	.3	46.0
2.81	1	.3	46.6
2.84	1	.3	47.1
2.90	1	.3	47.7
2.91	1	.3	48.3
2.93	1	.3	48.9
2.94	1	.3	49.4
2.94	1	.3	50.0
2.96	1	.3	50.6
2.98	1	.3	51.1
2.98	1	.3	51.7
2.99	1	.3	52.3
3.01	1	.3	52.9
3.01	1	.3	53.4
3.03	1	.3	54.0
3.03	1	.3	54.6
3.03	1	.3	55.2
3.03	1	.3	55.7
3.05	1	.3	56.3
3.05	1	.3	56.9
3.06	1	.3	57.5
3.06	1	.3	58.0

<i>HCROI</i>	<i>f</i>	<i>P</i>	<i>CUM-P</i>
3.13	1	.3	58.6
3.14	1	.3	59.2
3.14	1	.3	59.8
3.15	1	.3	60.3
3.15	1	.3	60.9
3.16	1	.3	61.5
3.17	1	.3	62.1
3.18	2	.6	63.2
3.20	1	.3	63.8
3.22	1	.3	64.4
3.22	1	.3	64.9
3.24	1	.3	65.5
3.25	1	.3	66.1
3.25	1	.3	66.7
3.27	1	.3	67.2
3.31	1	.3	67.8
3.35	1	.3	68.4
3.36	1	.3	69.0
3.36	1	.3	69.5
3.37	1	.3	70.1
3.41	1	.3	70.7
3.43	2	.6	71.8
3.45	1	.3	72.4
3.48	1	.3	73.0
3.48	1	.3	73.6
3.50	1	.3	74.1
3.57	1	.3	74.7
3.59	1	.3	75.3
3.62	1	.3	75.9
3.62	1	.3	76.4
3.63	1	.3	77.0
3.63	1	.3	77.6
3.67	1	.3	78.2
3.68	1	.3	78.7
3.74	1	.3	79.3

<i>HCROI</i>	<i>f</i>	<i>P</i>	<i>CUM-P</i>
3.76	1	.3	79.9
3.78	1	.3	80.5
3.81	1	.3	81.0
3.84	1	.3	81.6
3.86	1	.3	82.2
3.87	1	.3	82.8
3.88	1	.3	83.3
3.93	1	.3	83.9
3.96	1	.3	84.5
4.05	1	.3	85.1
4.07	1	.3	85.6
4.08	1	.3	86.2
4.11	1	.3	86.8
4.15	1	.3	87.4
4.19	1	.3	87.9
4.20	1	.3	88.5
4.22	1	.3	89.1
4.25	1	.3	89.7
4.26	1	.3	90.2
4.30	1	.3	90.8
4.34	1	.3	91.4
4.50	1	.3	92.0
4.54	1	.3	92.5
4.59	1	.3	93.1
4.62	1	.3	93.7
4.71	1	.3	94.3
5.01	1	.3	94.8
5.34	1	.3	95.4
5.71	1	.3	96.0
5.91	1	.3	96.6
5.95	1	.3	97.1
6.54	1	.3	97.7
8.30	1	.3	98.3
8.93	1	.3	98.9
14.78	1	.3	99.4

<i>HCROI</i>	<i>f</i>	<i>P</i>	<i>CUM-P</i>
27.30	1	.3	100.0
Total	174	54.5	
Missing	145	45.5	

Note. $N = 319$

APPENDIX: E – FREQUENCY OF COMPANY PER SECTOR

		Sector			
		<i>f</i>	<i>P</i>	Valid <i>P</i>	<i>CUM-P</i>
Valid	AltX	2	.6	.6	.6
	Automobiles & Parts	2	.6	.6	1.3
	Banks	8	2.5	2.5	3.8
	Basic Resource-Forestry&Paper	4	1.3	1.3	5.0
	Basic Resource-Ind Metal&Mining	9	2.8	2.8	7.8
	Basic Resource-Mining	54	16.9	16.9	24.8
	Chemicals	6	1.9	1.9	26.6
	Construction&Materials	20	6.3	6.3	32.9
	Financial Services	20	6.3	6.3	39.2
	Food&Beverage-Beverages	4	1.3	1.3	40.4
	Food&Beverage-Food Producers	14	4.4	4.4	44.8
	Health Care-Equipment&Services	4	1.3	1.3	46.1
	Health Care-Pharmaceutical&Biotechnol	4	1.3	1.3	47.3
	Ind Goods&Services-Electronic&Electr Equip	9	2.8	2.8	50.2
	Ind Goods&Services-General Industrials	10	3.1	3.1	53.3
	Ind Goods&Services-Industr Engineering	5	1.6	1.6	54.9
	Ind Goods&Services-Industr Transport	7	2.2	2.2	57.1
	Ind Goods&Services-Support Services	18	5.6	5.6	62.7

Sector				
	<i>f</i>	<i>P</i>	Valid <i>P</i>	<i>CUM-P</i>
Insurance-Life Insurance	6	1.9	1.9	64.6
Insurance-Nonlife Insurance	2	.6	.6	65.2
Investm Instruments-Equity Investm Instruments	11	3.4	3.4	68.7
Media	6	1.9	1.9	70.5
Oil&Gas Producers	3	.9	.9	71.5
Other-Other Securities	1	.3	.3	71.8
Personal&Household Goods-Household Goods&Home Construct	1	.3	.3	72.1
Personal&Household Goods-Leisure Goods	2	.6	.6	72.7
Personal&Household Goods-Personal Goods	2	.6	.6	73.4
Personal&Household Goods-Tabacco	1	.3	.3	73.7
Real Estate-Investment Trusts	6	1.9	1.9	75.5
Real Estate- Investment&Services	23	7.2	7.2	82.8
Retail-Food&Drug Retailers	5	1.6	1.6	84.3
Retail-General Retailers	17	5.3	5.3	89.7
Technology- Sortware&Computer Services	14	4.4	4.4	94.0
Technology-Technology Hardware&Equipment	2	.6	.6	94.7
Telecommunications-Fixed Line	1	.3	.3	95.0
Telecommunications- Mobile	4	1.3	1.3	96.2

Sector				
	<i>f</i>	<i>P</i>	Valid <i>P</i>	<i>CUM-P</i>
Travel&Leisure	12	3.8	3.8	100.0
Total	319	100.0	100.0	

APPENDIX: F – CROSSTABULATION FOR SECTOR AND COMPANY SIZE

(Sector: n = 40; Companies: N = 319)

Sector * Size Crosstabulation

		Size				
		Large	Medium	Small	Total	
Sector	AltX	% within Sector			100%	100%
		% within Size			.9%	.6%
		% of Total			.6%	.6%
Automobiles & Parts		% within Sector			100%	100%
		% within Size			.9%	.6%
		% of Total			.6%	.6%
Banks		% within Sector	62.5%	12.5%	25%	100%
		% within Size	12.5%	1.7%	.9%	2.5%
		% of Total	1.6%	.3%	.6%	2.5%
Basic Resource-Forestry&Paper		% within Sector			75%	100%
		% within Size			5%	1.3%
		% of Total			.9%	1.3%
Basic Resource-Ind Metal&Mining		% within Sector	22.2%	11.1%	66.7%	100%
		% within Size	5%	1.7%	2.7%	2.8%
		% of Total	.6%	.3%	1.9%	2.8%
Basic Resource-Mining		% within Sector	18.5%	9.3%	72.2%	100%
		% within Size	25%	8.3%	17.8%	16.9%
		% of Total	3.1%	1.6%	12.2%	16.9%
Chemicals		% within Sector			33.3%	100%
		% within Size			3.3%	1.9%
		% of Total			.6%	1.9%

Sector * Size Crosstabulation

		Size			
		Large	Medium	Small	Total
Construction&Materials	% within Sector		20%	80%	100%
	% within Size		6.7%	7.3%	6.3%
	% of Total		1.3%	5.0%	6.3%
Financial Services	% within Sector	10%	10%	80%	100%
	% within Size	5%	3.3%	7.3%	6.3%
	% of Total	.6%	.6%	5%	6.3%
Food&Beverage-Beverages	% within Sector	25%	25%	50%	100%
	% within Size	2.5%	1.7%	.9%	1.3%
	% of Total	.3%	.3%	.6%	1.3%
Food&Beverage-Food Producers	% within Sector	7.1%	28.6%	64.3%	100%
	% within Size	2.5%	6.7%	4.1%	4.4%
	% of Total	.3%	1.3%	2.8%	4.4%
Health Care-Equipment&Services	% within Sector		75%	25%	100%
	% within Size		5%	.5%	1.3%
	% of Total		.9%	.3%	1.3%
Health Care-Pharmaceutical&Biotechnol	% within Sector	25%	25%	50%	100%
	% within Size	2.5%	1.7%	.9%	1.3%
	% of Total	.3%	.3%	.6%	1.3%
Ind Goods&Services-Electronic&Electr Equip	% within Sector		22.2%	77.8%	100%
	% within Size		3.3%	3.2%	2.8%
	% of Total		.6%	2.2%	2.8%
Ind Goods&Services-General Industrials	% within Sector	10%	20%	70%	100%
	% within Size	2.5%	3.3%	3.2%	3.1%

Sector * Size Crosstabulation

		Size			
		Large	Medium	Small	Total
% of Total		.3%	.6%	2.2%	3.1%
Ind Goods&Services-Industr Engineering	% within Sector			100%	100%
	% within Size			2.3%	1.6%
	% of Total			1.6%	1.6%
Ind Goods&Services-Industr Transport	% within Sector		42.9%	57.1%	100%
	% within Size		5%	1.8%	2.2%
	% of Total		.9%	1.3%	2.2%
Ind Goods&Services- Support Services	% within Sector	5.6%		94.4%	100%
	% within Size	2.5%		7.8%	5.6%
	% of Total	.3%		5.3%	5.6%
Insurance-Life Insurance	% within Sector	50%	33.3%	16.7%	100%
	% within Size	7.5%	3.3%	.5%	1.9%
	% of Total	.9%	.6%	.3%	1.9%
Insurance-Nonlife Insurance	% within Sector		50%	50%	100%
	% within Size		1.7%	.5%	.6%
	% of Total		.3%	.3%	.6%
Investm Instruments-Equity Investm Instruments	% within Sector	9.1%	18.2%	72.7%	100%
	% within Size	2.5%	3.3%	3.7%	3.4%
	% of Total	.3%	.6%	2.5%	3.4%
Media	% within Sector	16.7%	16.7%	66.7%	100%
	% within Size	2.5%	1.7%	1.8%	1.9%
	% of Total	.3%	.3%	1.3%	1.9%
Oil&Gas Producers	% within Sector	33.3%		66.7%	100%

Sector * Size Crosstabulation

		Size			Total
		Large	Medium	Small	
	% within Size	2.5%		.9%	.9%
	% of Total	.3%		.6%	.9%
Other-Other Securities	% within Sector			100%	100%
	% within Size			.5%	.3%
	% of Total			.3%	.3%
Personal&Household Goods-Household Goods&Home Construct	% within Sector	100%			100%
	% within Size	2.5%			.3%
	% of Total	.3%			.3%
Personal&Household Goods-Leisure Goods	% within Sector			100%	100%
	% within Size			.9%	.6%
	% of Total			.6%	.6%
Personal&Household Goods-Personal Goods	% within Sector	50%		50.0%	100%
	% within Size	2.5%		.5%	.6%
	% of Total	.3%		.3%	.6%
Personal&Household Goods-Tabacco	% within Sector	100%			100%
	% within Size	2.5%			.3%
	% of Total	.3%			.3%
Real Estate-Investment Trusts	% within Sector	16.7%	50%	33.3%	100%
	% within Size	2.5%	5%	.9%	1.9%
	% of Total	.3%	.9%	.6%	1.9%
Real Estate- Investment&Services	% within Sector	4.3%	17.4%	78.3%	100%
	% within Size	2.5%	6.7%	8.2%	7.2%
	% of Total	.3%	1.3%	5.6%	7.2%

Sector * Size Crosstabulation

		Size			
		Large	Medium	Small	Total
Retail-Food&Drug Retailers	% within Sector	20%	80%		100%
	% within Size	2.5%	6.7%		1.6%
	% of Total	.3%	1.3%		1.6%
Retail-General Retailers	% within Sector	11.8%	23.5%	64.7%	100%
	% within Size	5%	6.7%	5%	5.3%
	% of Total	.6%	1.3%	3.4%	5.3%
Technology-Software&Computer Services	% within Sector		7.1%	92.9%	100%
	% within Size		1.7%	5.9%	4.4%
	% of Total		.3%	4.1%	4.4%
Technology-Technology Hardware&Equipment	% within Sector			100%	100%
	% within Size			.9%	.6%
	% of Total			.6%	.6%
Telecommunications-Fixed Line	% within Sector		100%		100%
	% within Size		1.7%		.3%
	% of Total		.3%		.3%
Telecommunications-Mobile	% within Sector	50%	25%	25%	100%
	% within Size	5%	1.7%	.5%	1.3%
	% of Total	.6%	.3%	.3%	1.3%
Travel&Leisure	% within Sector		16.7%	83.3%	100%
	% within Size		3.3%	4.6%	3.8%
	% of Total		.6%	3.1%	3.8%
Total	% within Sector	12.5%	18.8%	68.7%	100%
	% within Size	100%	100%	100%	100%

Sector * Size Crosstabulation

	Size			Total
	Large	Medium	Small	Total
% of Total	12.5%	18.8%	68.7%	100%

APPENDIX: G – ASSESSMENT OF UNIVARIATE NORMALITY: SUMMARY OF KOLMOGOROV-SMIRNOV TEST STATISTIC

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The categories of Company occur with equal probabilities.	One-Sample Chi-Square Test	1.000	Retain the null hypothesis.
2	The categories of Indicate occur with equal probabilities.	One-Sample Chi-Square Test	1.000	Retain the null hypothesis.
3	The categories defined by Published = 0 and occur with probabilities 0.5 and 0.5.	One-Sample Binomial Test	.000	Reject the null hypothesis.
4	The categories of Initial Currency occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
5	The categories of Sector occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
6	The categories of Size occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
7	The distribution of CoNr is normal with mean 162.04 and standard deviation 93.31.	One-Sample Kolmogorov-Smirnov Test	.217	Retain the null hypothesis.
8	The distribution of Profit per employee y1 is normal with mean 347,823.83 and standard deviation 713,420.66.	One-Sample Kolmogorov-Smirnov Test	.180	Retain the null hypothesis.
9	The distribution of Profit per employee y2 is normal with mean 594,976.09 and standard deviation 2,469,296.32.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
10	The distribution of Profit per employee y3 is normal with mean 367,031.12 and standard deviation 979,880.32.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
11	The distribution of Profit per employee y4 is normal with mean 83,916.80 and standard deviation 4,433,233.70.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
12	The distribution of Profit per employee y5 is normal with mean 465,381.74 and standard deviation 1,066,125.53.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
13	The distribution of Profit per employee y6 is normal with mean 675,512.84 and standard deviation 3,197,319.10.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
14	The distribution of Turn10 is normal with mean 12,964,484.36 and standard deviation 34,983,606.41.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
15	The distribution of Cost10 is normal with mean 7,598,216.13 and standard deviation 15,690,485.15.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
16	The distribution of Income10 is normal with mean 4,358,900.41 and standard deviation 15,198,364.31.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
17	The distribution of Profit10 is normal with mean 1,593,542.69 and standard deviation 7,138,626.09.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
18	The distribution of Direct10 is normal with mean 23,991.46 and standard deviation 51,683.60.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
19	The distribution of Staff10 is normal with mean 2,048,815.51 and standard deviation 4,675,660.43.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
20	The distribution of Turn09 is normal with mean 13,046,442.01 and standard deviation 36,962,304.95.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
21	The distribution of Cost09 is normal with mean 7,574,785.95 and standard deviation 16,192,478.84.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
22	The distribution of Income09 is normal with mean 3,591,755.29 and standard deviation 12,731,877.64.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
23	The distribution of Profit09 is normal with mean 895,481.39 and standard deviation 4,513,933.94.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
24	The distribution of Direc09 is normal with mean 18,729.32 and standard deviation 24,181.47.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
25	The distribution of Staff09 is normal with mean 1,967,831.47 and standard deviation 4,709,104.84.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
26	The distribution of Turn08 is normal with mean 13,272,656.82 and standard deviation 40,983,037.99.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
27	The distribution of Cost08 is normal with mean 7,059,955.69 and standard deviation 15,594,686.51.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
28	The distribution of Income08 is normal with mean 4,197,376.51 and standard deviation 18,482,427.70.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
29	The distribution of Profit08 is normal with mean 1,413,453.60 and standard deviation 9,209,933.65.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
30	The distribution of Direct08 is normal with mean 19,223.06 and standard deviation 28,041.59.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
31	The distribution of Staff08 is normal with mean 1,867,049.77 and standard deviation 4,533,542.56.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
32	The distribution of Turn07 is normal with mean 11,072,529.43 and standard deviation 28,692,378.42.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
33	The distribution of Cost07 is normal with mean 6,365,187.47 and standard deviation 13,457,551.61.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
34	The distribution of Income07 is normal with mean 3,563,343.85 and standard deviation 12,035,075.59.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
35	The distribution of Profit07 is normal with mean 1,210,076.17 and standard deviation 4,607,669.49.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
36	The distribution of Direct07 is normal with mean 20,875.04 and standard deviation 34,835.61.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
37	The distribution of Staff07 is normal with mean 1,642,236.36 and standard deviation 3,792,785.46.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
38	The distribution of Turn06 is normal with mean 10,448,482.20 and standard deviation 28,768,341.11.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
39	The distribution of Cost06 is normal with mean 6,633,227.06 and standard deviation 16,642,458.91.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
40	The distribution of Income06 is normal with mean 3,651,141.87 and standard deviation 11,722,580.86.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
41	The distribution of Profit06 is normal with mean 1,494,475.91 and standard deviation 4,696,486.21.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
42	The distribution of Direct06 is normal with mean 16,473.69 and standard deviation 22,049.47.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
43	The distribution of Staff06 is normal with mean 1,638,022.69 and standard deviation 3,974,113.59.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
44	The distribution of casenum is normal with mean 162.74 and standard deviation 92.64.	One-Sample Kolmogorov-Smirnov Test	.230	Retain the null hypothesis.
45	The distribution of Pay&Benefits'10 is normal with mean 1,993,029.04 and standard deviation 4,626,984.35.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
46	The distribution of Pay&Benefits'09 is normal with mean 1,889,291.22 and standard deviation 4,625,054.89.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
47	The distribution of Pay&Benefits'08 is normal with mean 1,739,164.14 and standard deviation 4,398,521.02.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
48	The distribution of Pay&Benefits'07 is normal with mean 1,521,737.09 and standard deviation 3,676,021.06.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
49	The distribution of Pay&Benefits'06 is normal with mean 1,420,493.14 and standard deviation 3,735,134.62.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
50	The distribution of HCRDI_10 is normal with mean 3.06 and standard deviation 2.58.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
51	The distribution of HCRDI_09 is normal with mean 3.01 and standard deviation 2.39.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.

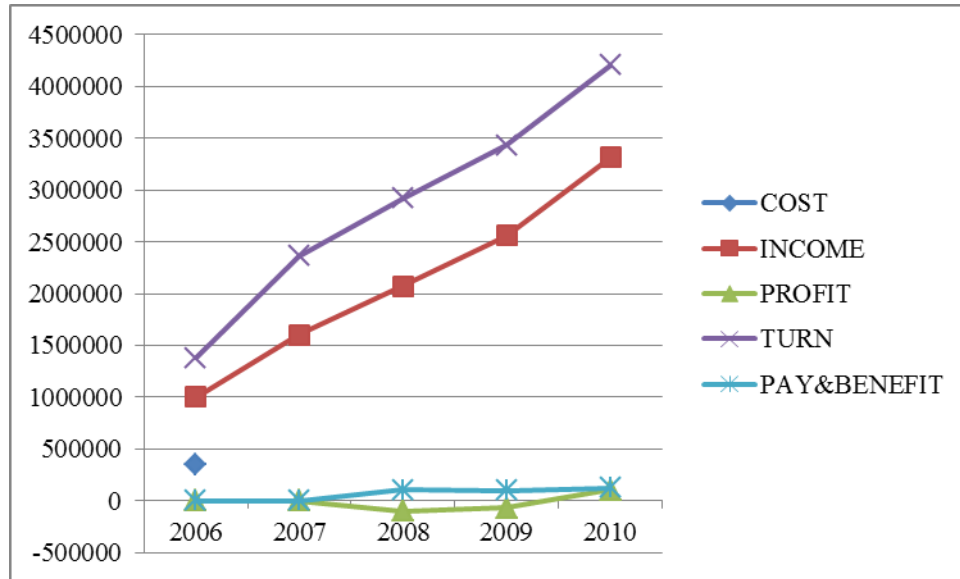
Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HCROI_08 is normal with mean 5.14 and standard deviation 9.17.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
53	The distribution of HCROI_07 is normal with mean 4.82 and standard deviation 7.59.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
54	The distribution of HCROI_06 is normal with mean 15.91 and standard deviation 87.05.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.

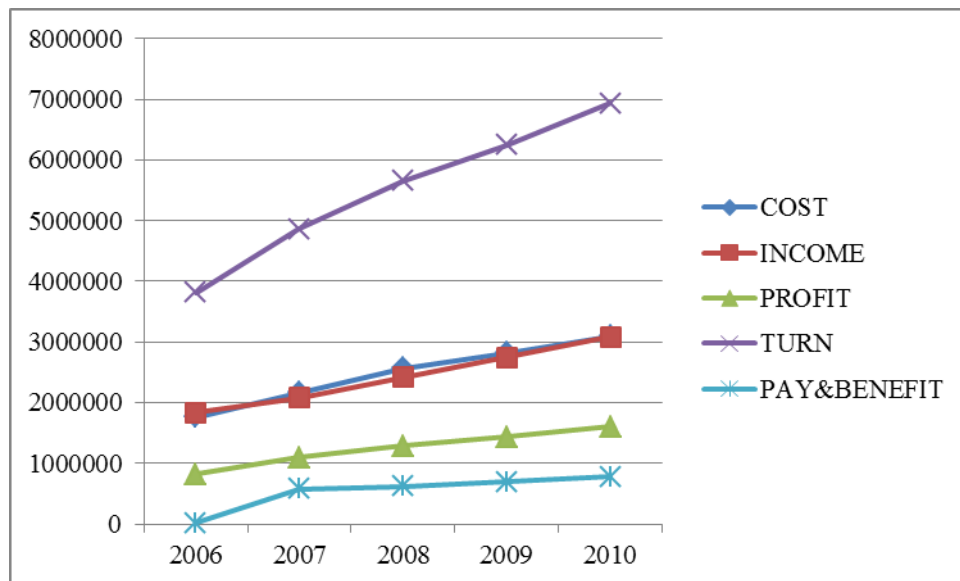
Asymptotic significances are displayed. The significance level is .05.

APPENDIX: H – FIGURES OF THE HCROI OUTLIERS PER YEAR (2006 – 2010)



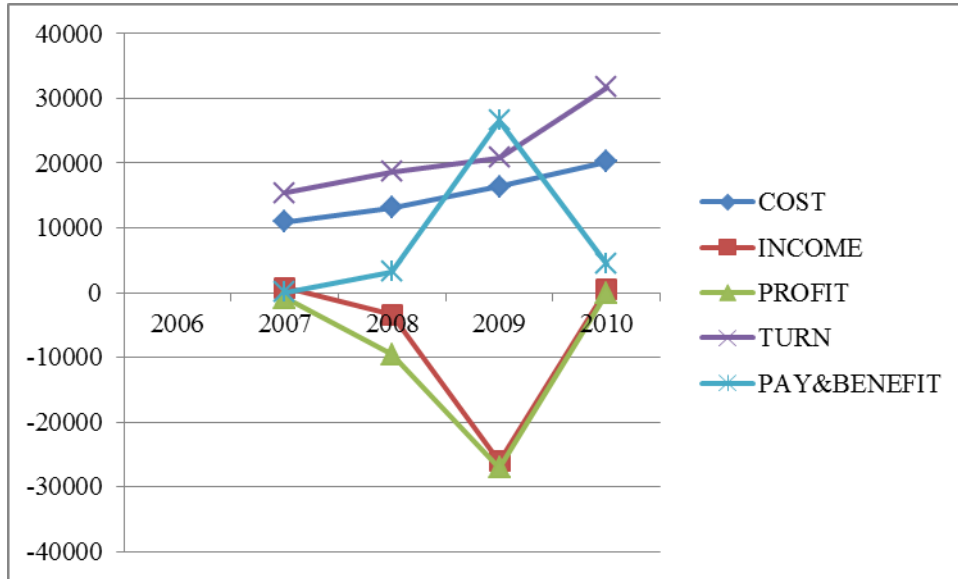
Note. Value in ZAR ('000)

Figure 4.13. 2006 HCROI outlier of 828.38 for company 128



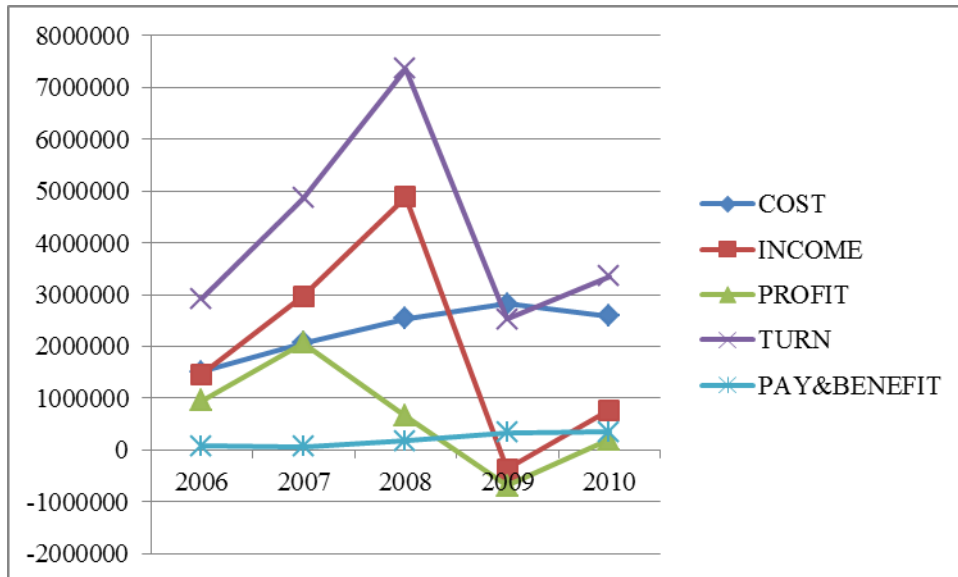
Note. Value in ZAR ('000)

Figure 4.14. 2006 HCROI outlier 124.14 for company 301



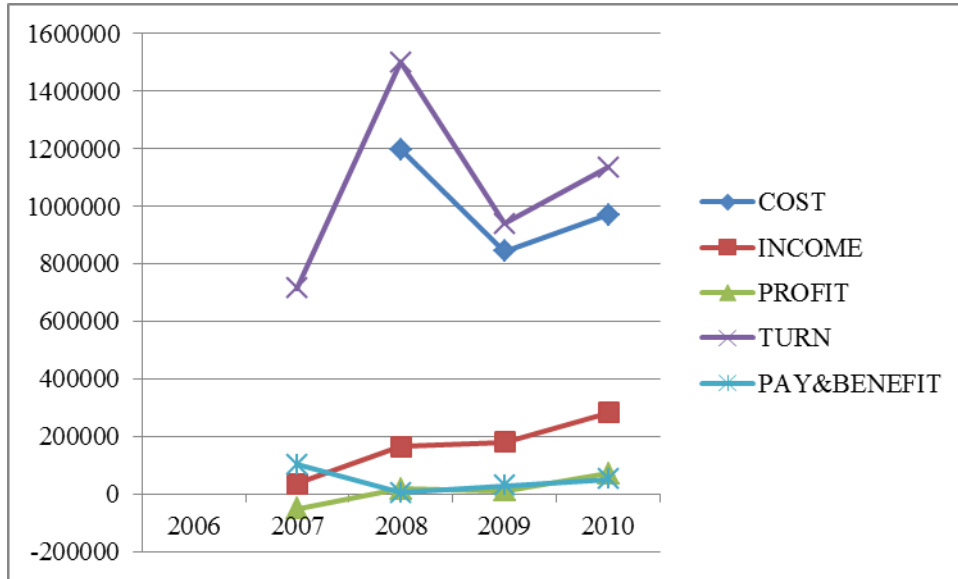
Note. Value in ZAR ('000)

Figure 4.15. 2007 HCROI outlier 64.81 for company 258



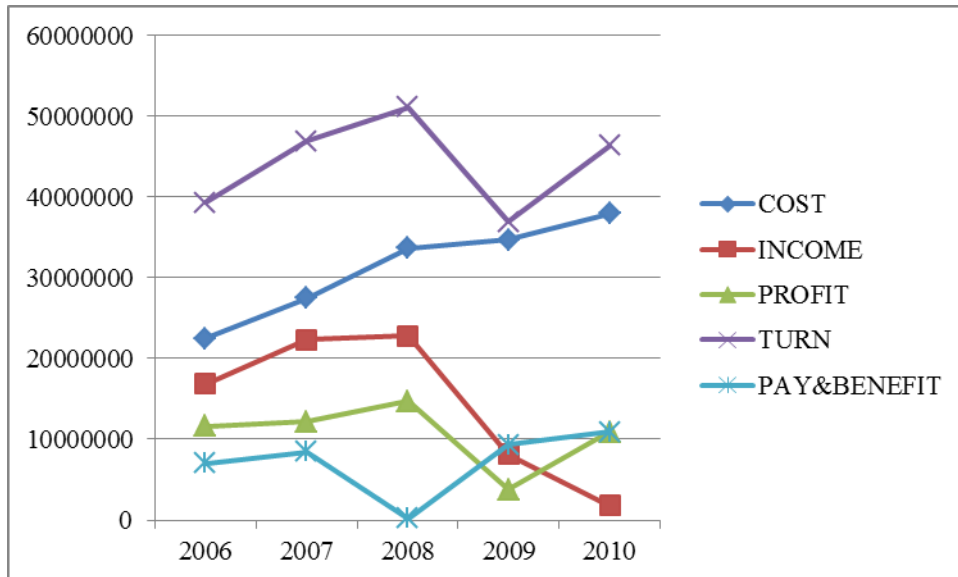
Note. Value in ZAR ('000)

Figure 4.16. 2007 HCROI outlier 51.04 for company 28



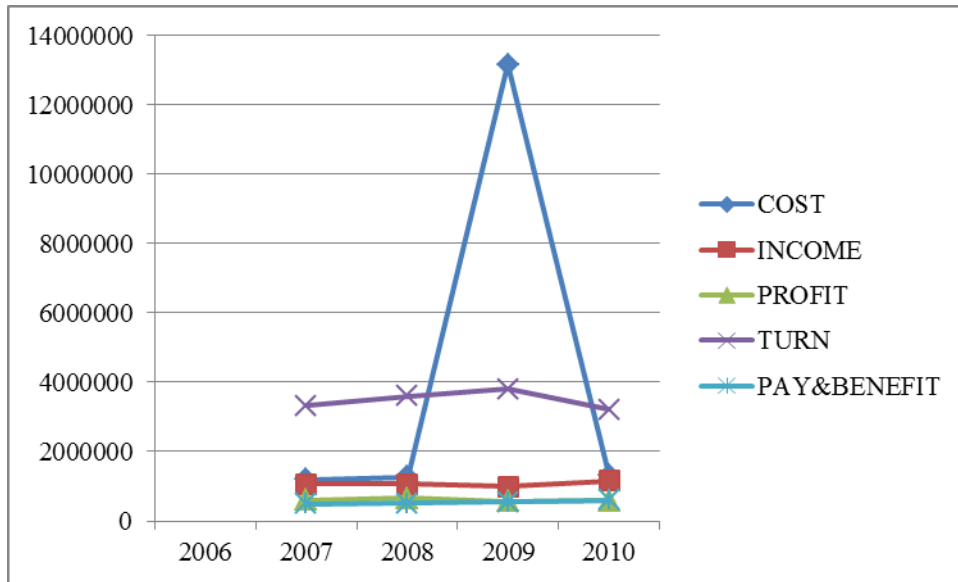
Note. Value in ZAR ('000)

Figure 4.17. 2008 HCROI outlier 64.33 for company 99



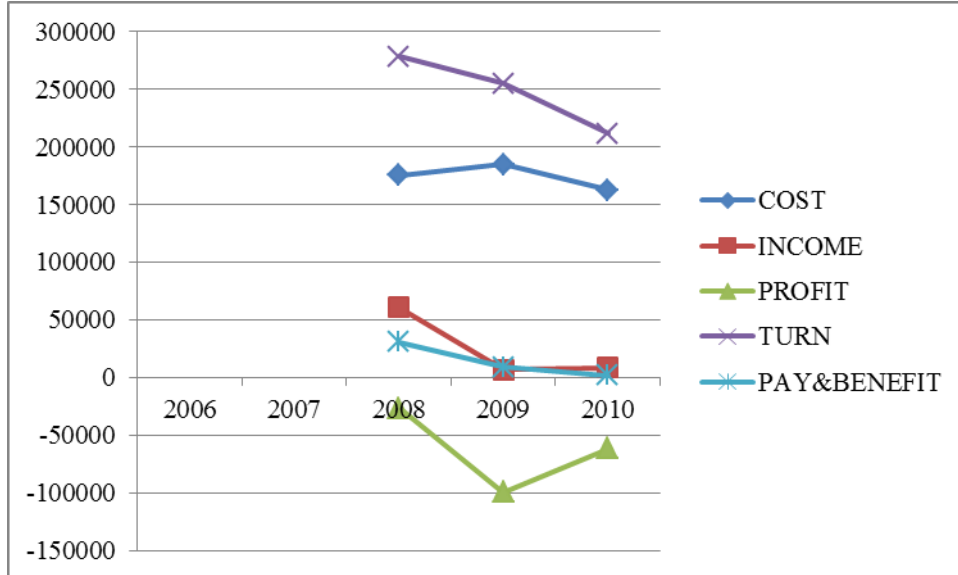
Note. Value in ZAR ('000)

Figure 4.18. 2008 HCROI outlier 81.60 for company 24



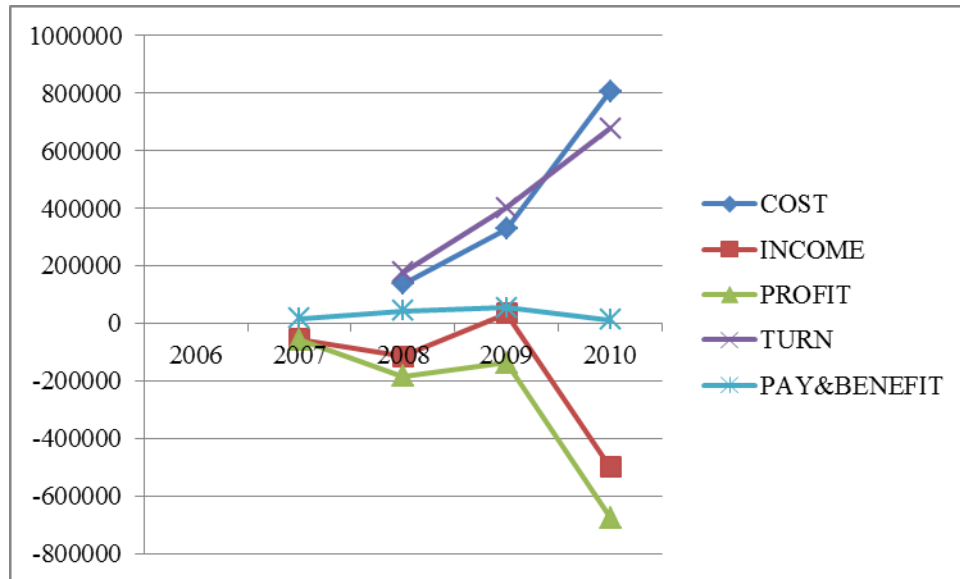
Note. Value in ZAR ('000)

Figure 4.19. 2009 HCROI outlier -16.16 for company 163



Note. Value in ZAR ('000)

Figure 4.20. 2010 HCROI outlier 27.30 for company 252



Note. Value in ZAR ('000)

Figure 4.21. 2010 HCROI outlier -8.89 for company 114

APPENDIX: I – ETHICS REPORT

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ETHICS REVIEW REPORT

Applicant: Mrs H Viljoen
Project title: Human capital return-on-investment (HCROI) in South African companies listed on the Johannesburg Stock Exchange (JSE)
Nature of research project: MComm (HRM)
Supervisor (if applicable): Mr F De Kock
Date: 23 September 2011

The research proposal of Mrs H Viljoen was considered and evaluated in terms of the guidelines prescribed by the Stellenbosch University Framework Policy to Promote and Ensure Ethically Responsible Research, adopted by the Senate on 20 March 2009. The research proposal was presented by the researcher during a formal presentation session on 23 September 2011 attended by Proff DJ Malan, A Engelbrecht, CC Theron, Drr G Görgens and B Boonzaier, Mr GG Cillié and Ms S Adams. The purpose of this review is to ascertain whether there are any ethical risks associated with the proposed research project of which the researcher has to be aware or, to assess the nature and extent of these ethical risks, and to suggest measures that can be taken to avoid or minimize these risks.

Summary of Research

The objective of this study is to describe the levels of human capital effectiveness of South African companies listed on the Johannesburg stock exchange. The purpose of the research is to develop a human capital effectiveness norm table that would assist in the meaningful evaluation of the extent to which human capital contribute to company profit.

Documents Received:

The Departmental Research Ethics Committee received the following documentation as part of the submission for ethical clearance:

An application for ethical clearance [Signed by the researcher, head of department and/or supervisor]	Yes
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Copies of relevant letters of permission submitted	No ¹
Research Proposal	Yes
Informed Consent Form	NA
Questionnaires	NA
Interview schedule	NA

The committee provided the following feedback:

Finding of Departmental Research Ethics Committee (DREC): [the issue that should receive attention]	Suggestions by DREC [what must be done about the issue; or what could be done about the issue]	Responses by the Researcher/Principal Investigator
The proposed research does not involve the collection of data <u>from</u> human research participants either as individuals or as collectives	None	
The unit of analysis in the research is the organization. Information on those organizations included in the target population [companies listed on the JSE] will be collected from a source on the public domain [McGregor's BFA website]. Institutional permission is therefore not required from the companies included in the target population. The information is published in the public domain to allow individuals and groups to conduct research on company performance	None	
The researcher will inform companies of the study after it had been completed as a gesture of courtesy and invite participating companies to	None	

¹ Data that is in the public domain will be obtained from McGregor's BFA website

view the results.		
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Please take note that the researcher should respond to all the comments (i.e. providing amended forms, responding to queries in notes to the Departmental Research Ethics Committee) and provide the committee with all the relevant documentation before the empirical phase of the research may commence.

Recommendation:

On the basis of the application submitted to the Departmental Research Ethics Committee, the proposed research project may continue with the proviso that:

1. The researcher will remain within the procedures and protocols indicated in the proposal, particularly in terms of any undertakings made in terms of the confidentiality of the information gathered.
2. The research will again be submitted for ethical clearance if there is any substantial departure from the existing proposal.
3. The researcher will remain within the parameters of any applicable national legislation, institutional guidelines and scientific standards relevant to the specific field of research.

MEMBERS , G Görgens, J Malan, CC Theron