



GORDON INSTITUTE
OF BUSINESS SCIENCE

University of Pretoria

**The independent and joint effects of skill and physical bases of
relatedness in diversification of organisations listed in the Industrial
sector of the JSE.**

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of

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ABSTRACT

Diversification is an important strategic alternative commonly used by organisations in pursuit of different markets and greater returns. Within the resource based view, (Collins & Montgomery, 2005) suggest that an effective diversification strategy can only be conducted if there is a fit between resources and the business opportunity so that resources contribute to competitive advantage.

A quantitative research methodology was followed whereby organisations listed within the Industrial sector of the Johannesburg Securities Exchange (JSE) were categorized as diversified from period 2000 to 2010. The study empirically examined the independent and joint relationship between physical and skill base of relatedness against three financial measures in the form of hypotheses, to determine which base of relatedness influenced better performance.

All three bases of relatedness had no significant effect on organizational financial performance. The findings refine our understanding of relatedness as a multidimensional concept and suggest that to have a more comprehensive evaluation of corporate diversification and its value in boosting company performance, a matrix of interrelationships across lines of business, activities, resources, industry effects and many more variables should be considered.

KEYWORDS

Diversification, relatedness, resource-based view

DECLARATION

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

.....

Konanani Tshivhase

Date: 9th November 2011

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1. INTRODUCTION TO RESEARCH PROBLEM

1.1 BACKGROUND and PROBLEM DESCRIPTION

A corporate level strategy specifies actions a firm takes to gain competitive advantage by selecting and managing a group of different businesses competing in different product markets. With related diversification, a firm builds upon or extends its resources and capabilities to create value through economies of scope by successfully sharing some of its capabilities or transferring core competencies into other lines of business (Ireland, Hoskisson, & Hitt, 2009).

Relatedness, the logic and extent by which a firm's different lines of business are connected, has important research and practical implications (Rumelt, 1974). Firms and industries can be viewed as collections of interrelated activities (Porter, 1985) and resources (Penrose, 1959), so relatedness between a firm's different lines of business (or industries) can manifest itself along many different dimensions.

In particular, new approaches to the assessment and measurement of relatedness have provided important insights regarding firm diversification strategy and performance (Montgomery, 1982; Rumelt, 1974). Yet, despite the multiplicity of approaches to relatedness, the idea that relatedness encompasses several dimensions has not been adequately researched.

The conflicting results regarding performance differences between related and unrelated diversification strategies may, in fact, be a result of the different ways of categorizing diversification strategies (Ramanujam and Varadarajan, 1989). While extensive literature examines the diversification-performance relationship, little

agreement exists concerning the nature of this relationship. A study conducted by (Palich & Cardinal, 2000) indicates that moderate levels of diversification yield higher levels of performance than either limited or extensive diversification.

In South Africa, there have been few studies on the diversification-performance relationship. The apartheid era of pre-1994 led the country into economic isolation, resulting in dominant and diversified organizations. With the integration of South Africa in the global economy, many organisations divested their non-core business units with evidence showing better performance following the spin-offs (Bhana, 2004). A few organisations that remained diversified performed well examples including Imperial Holdings and Bidvest Limited.

The lack of consensus on the diversification-performance relationship calls for multidimensional view on relatedness, appreciation both of the implications of choosing one among several criteria for relatedness; and of combining different bases of relatedness as noted by Farjoun (1994).

Given the existence of multiple ways to assess relatedness, the overall degree of relatedness (and consequently its combined or net expected performance benefits) must be determined. Thus, a combined assessment of bases of relatedness has both theoretical and practical significance (Farjoun, 1994).

This study focuses on two important bases of relatedness: skills and physical characteristics. The physical base concerns relations between the physical characteristics of products, whereas the skill base consists of research and

development teams, managerial and other skills common to two or more products as depicted by Gort (1962).

This study would be of interest to company executives in helping them answer questions relating to variables to take into account in designing their growth strategies through diversification.

1.2 OBJECTIVE OF THIS RESEARCH

The objective of research was to ascertain how the skill and physical bases differ in the ways they identify relatedness in the same set of industries and what the separate and joint contributions of the two approaches are in explaining firm performance differences.

The research was based on Farjoun's (1998) developed approach that captures the conventional physical base and the less considered skill base of relatedness. This coincides with the growing interest in intangible resources, in particular, human skills as shared in the resource-based view by Barney, (1991) and Penrose (1959).

Merino and Rodriguez (1997) support the latter by arguing that to obtain consistent estimators in diversification; every relevant effect must be considered in the specification as the presence of non-observed firm effects causes inconsistency in the estimations.

The aim of the study was to measure the effects of physical and skill base of relatedness both independently and jointly and to compare which relationship has the greatest effect on organisational performance.

1.3 SCOPE AND LIMITATIONS OF THIS RESEARCH

1.3.1 SCOPE

The scope of this research focuses on the classification of organisations as diversified using a categorization method developed by (Rumelt, 1982) and (Pandaya & Rao, 1998) as well classifying the organisation's activities according to their reported Standard Industrial Classification (SIC) code. Using a skill-based approach, the organisations were further characterized based on their underlying skill profile required in that industry.

The organisations that were analyzed as part of the population had to meet the following criteria:

- The organisations in the sample had to remain listed on the JSE over the ten year period from 2000 to 2010.
- The organisations' financial data was reviewed and three-digit level SIC codes assigned to their segmented revenue reporting to determine level of diversification.
- The organizations within the sample had to remain in the same diversification category for the study period.
- The comparison of organisations was within the Industrial sector of the JSE.
- The skill profiles assessed pertained to the sub-industries within the Industrial sector.

The financial and market-based performance measurements that were used are measurements that have previously been used in other diversification studies e.g. (Pandaya & Rao, 1998)

1.3.2 POTENTIAL LIMITATIONS

- The study only focused on industries within one sector of the JSE due to data availability and time constraints.
- Using only the diversified category and not the further finer diversification categories such as the nine defined by (Rumelt, 1982) limited the study.
- The financial data did not clearly classify segmented revenue reporting for assigning the relevant SIC codes in an objective manner.
- Analysis of organization SIC code was done at the three-digit level. A more in depth analysis would require the SIC code analysis to be done at the four-digit level.
- The sample size of diversified organisations within the Industrial Sector is relatively small.
- A limitation was the question around the reliability of cluster analysis as a methodology to determine skill-related industry groups.
- The lack of South African research material relating to skill impact and financial performance measurements on diversification was a limiting factor.

2. LITERATURE REVIEW

2.1 DIVERSIFICATION AS A STRATEGY

A review of the literature reveals that there is a great deal of variation in the way diversification is conceptualized, measured, and defined. Gort (1962) defined diversification in terms of the concept of 'heterogeneity of output' based on the number of markets served by that output. Berry (1975) notes diversification as a representation of an increase in the number of industries in which firms are active.

In a synthesis by Ramanujam and Varadarajan (1989), a framework is developed for the classification of research on diversification into two categories. Studies falling in the first category are concerned with describing the relevant phenomenon and delineating or developing concepts; for example the choice of direction of diversification by Booz, Allen and Hamilton (1985). Studies falling in the second category, 'linkage-exploring' studies, have explored simple bivariate relationships as well as more involved contingency-type relationships involving more than a pair of variables, factors, or concepts. For example Dundas and Richardson (1980) in Ramanujam and Varadarajan (1989) say that specific types of market failures give rise to specific classes of diversified firms. Imperfections in the product and technological markets lead to related-diversified firms and that capital market failure gives rise to unrelated-diversified firms.

Pitts and Hopkins (1982) use the word 'business' rather than 'industry', in defining diversification as the extent to which firms operate in different businesses simultaneously. Ansoff's (1957) notion of diversification emphasizes the entry of

firms into new markets with new products, with his emphasis on the diversification act rather than the state of diversity.

Ramanujam and Varadarajan (1989) defined diversification as the entry of a firm or business unit into new lines of activity either by processes of internal business development or acquisition, which entail changes in its administrative, structure, systems and other management processes.

A Booz, Allen and Hamilton study defined diversification as a means of spreading the base of a business to achieve improved growth and/or reduce overall risk (Booz, Allen and Hamilton, 1985).

Ansoff (1958) developed a matrix for organizations to pursue growth alternatives as different product-market strategies. He argued that a simultaneous pursuit of market penetration, market development and product development were signs of healthy progress in an organization, but that diversification was different from the other strategies in that it required new skills, techniques and facilities and would lead to an organizational change in structures and functioning.

Ireland, Hoskisson and Hitt (2009) state that the primary reason a firm uses a corporate-level strategy to become more diversified is to create additional value. Firms seek diversified strategies if they can develop economies of scope or financial economies between businesses.

Booz, Allen and Hamilton (1985) further noted that diversification includes all investments except those aimed directly at supporting the competitiveness of existing businesses; may take the form of investments that address new products,

services, customer segments, or geographic markets; and lastly may be accomplished by different methods including internal development, acquisitions, joint ventures, licensing and agreements. This definition attempted to capture the goals of diversification, its direction, the means by which it is accomplished and the different types of investment decisions that qualify as diversification moves.

In their critique of research on corporate diversification, Ramanujam and Varadarajan (1989), look at three themes in empirically based literature. The first theme is identified as the mode or direction of diversification and market structure/performance and they conclude that in the industrial organisation economics studies, conglomerate diversification is usually understood as unrelated diversification, whereas in the finance studies it often refers to diversification through merger or acquisition. These differences in terminology render comparison of findings to be difficult. The findings themselves are inconclusive as to whether conglomerate unrelated diversification results in anticompetitive effects and whether it does lead to risk reduction for investors.

The second theme is diversity status, market structure, and performance and the collective evidence from this stream of work seems to be that diversity status is a powerful predictor of performance but market structure does exert an influence on performance of diversified firms independent of the effect of diversity (Ramanujam & Varadarajan, 1989).

The results of most studies have extended or marginally modified Rumelt's (1974) original work. Montgomery (1982) raised a controversy about the relative

influence of key market structure variables and diversity status as alternative explanators of firm performance, but Rumelt (1982) used a rigorous theoretical framework to defend the role of diversification strategy as a key influence on performance even after controlling for market structure influences.

The third and last theme looking at the relationship between diversity and structure suggests that the structural orientation of internal growth diversifiers is characterized by vigorous pursuit of interdivisional resource sharing, while that of acquisitive diversifiers reflects little emphasis on resource sharing, and, indeed, may even deliberately discourage such sharing. It is evident from this stream of work that the benefits of diversification are not automatically realized, and administrative mechanisms must be designed to consciously realize these benefits (Ramanujam & Varadarajan, 1989).

2.2 REASONS FOR DIVERSIFICATION

Six reasons for diversifying were identified by Haberberg and Rieple (2001) as to seek growth and capture value added opportunities, spread risk, prevent competitors from gaining ground, achieve synergy, control the supply and distribution channel and lastly for the fulfilment of personal ambition by senior management.

(Ireland, Hoskisson, & Hitt, 2009) Summarized their reasons for diversification as represented in **Table 1**:

Table 1: Reasons for Diversification

<p>Value-Creating Diversification</p> <ul style="list-style-type: none"> - Economies of scope <ul style="list-style-type: none"> o Sharing activities o Transferring core competencies - Market Power <ul style="list-style-type: none"> o Blocking competitors through multipoint competition o Vertical integration - Financial economies <ul style="list-style-type: none"> o Efficient internal capital allocation o Business restructuring
<p>Value-Neutral Diversification</p> <ul style="list-style-type: none"> ▪ Antitrust regulation ▪ Tax laws ▪ Low performance ▪ Uncertain future cash flows ▪ Risk reduction for firm ▪ Tangible resources ▪ Intangible resources
<p>Value-Reducing Diversification</p> <ul style="list-style-type: none"> ▪ Diversifying managerial employment risk ▪ Increasing managerial compensation

Source: (Ireland, Hoskisson, & Hitt, 2009)

2.3 REASONS FOR DIVERSIFICATION IN SOUTH AFRICA

Ireland et al. (2009) note that with related diversification; a firm builds upon or extends its resources and capabilities to create value through economies of scope by successfully sharing some of its capabilities or transferring core competencies into other lines of business.

South Africa has undergone a remarkable transition since the end of apartheid in 1994. One legacy from the previous regime is the severe gap in skills attainment as

a consequence of apartheid policies; with current skill levels that are more reflective of a less developed country.

The World Summit on Information Society (WSIS) declared that acquiring skills and knowledge is essential in order to understand, participate actively and benefit fully from, the Information Society and the knowledge economy. However, South Africa faces significant human capital development challenges impacting on the building of an Inclusive Information Society which manifest itself through the shortage of skills at all levels.

The shortage is often attributed to the mismatch between the supply of skills and the skills demanded in the labour market. The shortage of skills is further aggravated by a loss of skills to other countries that offer higher salaries and better conditions of employment (Presidential National Commission on Information Society and Development, 2011).

Considering that skills shortage and educational gaps are prevalent, a key incentive for the leadership of many of the South African organisations could be to partially alleviate this challenge through the sharing of capabilities and competencies across various business units within diversified organisations.

2.4 RELATEDNESS IN DIVERSIFICATION

Previous findings that related diversification creates value have been called into question over concerns about methodology and measures. While reviewing existing theory to consider how a firm's knowledge base interacts with its product market activity, (Miller, 2006) addresses several of these concerns by creating a

measure of technological diversity based on citation-weighted patents. The measure indicates a firm's opportunity for corporate diversification based on economies of scope in valuable knowledge assets, as defined for both single- and multi-business firms.

Ramanujam and Varadarajan (1989) note that the conflicting results regarding performance differences between related and unrelated diversification strategies may, in fact, be a result of the different ways of categorizing diversification strategies. Farjoun (1998) further states that an often overlooked benefit of using multiple views of relatedness; is that it can help existing firms identify different sources of potential competition and opportunities for diversification.

The concept of relatedness essentially deals with relationships between activities or resources. Therefore, its significance goes far beyond the study of diversification and its consequences. A multidimensional view of relatedness can further understanding of cooperation, competition, and-even more fundamentally the underlying reasons for the existence of firms as value creating institutions (Farjoun, 1998).

2.5 DETERMINING THE LEVEL OF RELATEDNESS IN DIVERSIFICATION

As the study focused on diversified organisations approaches used to determine the level of diversification are reviewed. The first approach was established by (Rumelt, 1982) who came up with a categorization model where organisations were classified into various categories based on ratios of revenues earned as a fraction of the total revenue.

In Rumelt's scheme, the least diversified (single business) is on one side of the scale and the most diversified (unrelated business) on the other side. The organisation's financial information was used to calculate the following two ratios required to determine a level of diversification:

- Specialization Ratio (SR) – Taking the business unit to be a product, product line, or set of product lines that have strong market interdependencies, a firm's specialization ratio, is the fraction of revenues accounted for by its largest single business unit.
- Related Ratio (RR) – A firm's related ratio is the fraction of its revenues attributable to its largest group of businesses which share or draw on the same common skill, strength or resource.

Rumelt (1982) developed an index to determine the level of diversification by evaluating the quantum of revenue generated through activities of a similar nature.

Table 2: Rumelt's major categories of diversification

Category	Definition	Ratio
Single Business	Company committed to a single business	$SR \geq 0.95$
Dominant Business	Companies that have diversified to some extent but still obtain the predominance of their revenues from a single business	$0.7 \leq SR < 0.95$
Related Business	Nonvertical dominant companies that have diversified by building on some particular strength with the original dominant activity	$SR < 0.7$
Unrelated Business	Nonvertical companies that have chiefly diversified without regard to relationships between new businesses and current activities.	$RR < 0.7$

Source: (Rumelt, 1982)

Rumelt's classification has been used and modified by other researchers such as Pandaya and Rao (1998). Research conducted by Pandaya and Rao (1998) in the USA used Rumelt's classification schemes, but adjusted the SR value for their purposes to focus on three of the categories. Pandaya and Rao (1998) utilized a Compustat database to calculate the various organisations SR, whereby the organisations were classified into a modified scheme which is summarized in **Table 3**.

Table 3: Pandaya and Rao's SR classification

Category	Rumelt's SR Values	Pandaya and Rao's SR Ratio
Single Business	$SR \geq 0.95$	$SR \geq 0.95$
Dominant Business (Moderately diversified organization)	$0.7 < SR < 0.95$	$0.5 < SR < 0.95$
Related Business (Highly diversified organization)	$SR < 0.7$	$SR < 0.5$

Source: (Pandaya & Rao, 1998)

Pandaya and Rao (1998) argued that the adjustment of the SR from 0.7 to 0.5 was to address the contradictory arguments advanced by researchers in finance and management disciplines.

The second approach is known as the product count measure which uses the Standard Industrial Classification (SIC) developed in the United States of America. SIC classification is defined by (Montgomery, 1982) as a numerical system developed for the classification of all types of economic activity within the USA.

SIC classification has been adopted world-wide and in South Africa and has become an accepted standard of reporting economic activities. The SIC classification can go up to a 5 digit number that has the following meaning as indicated in **Table 4**:

Table 4 : SIC Code Levels

SIC Digit	Level of economic activity
First Digit	Major Division
Second Digit	Division
Third Digit	Major Group
Fourth Digit	Group
Fifth Digit	Sub-Group

Source: (Companies and Intellectual Property Commission (CIPC), 2011)

The research report will categorize organisations as diversified using (Pandaya & Rao, 1998) Specialization Ratio (SR) in conjunction with the product count measure at a three digit level.

2.6 PHYSICAL AND SKILL AS BASES OF RELATEDNESS IN DIVERSIFICATION

Underlying the physical base of relatedness is a concept of firms or industries as collections of material resources and physical processes. Elements of these collections are raw materials, physical processes, plant and equipment, manuals and blueprints, and computer hardware and software, among others (Farjoun, 1998).

The skill base concept views firms or industries as sets of interrelated bodies of human knowledge that come together in the process of providing goods and services (Farjoun, 1998). The premise for the recognition of the importance of

resources to a firm's competitive position was started by Edith Penrose (1959) who argued that a firm's growth, both internally and externally through merger, acquisition and diversification is due to the manner in which its resources are employed. A firm consists of a collection of productive resources and these only contribute to a firm's advantage to the extent that they are exploited in such a manner that their potentially valuable services are made available to the firm (Penrose, 1959).

Echoing Penrose, Rubin (1973) recognized that resources were not of much use themselves and argued that firms must process raw resources to make them useful. Wernerfelt (1984) in his first attempt of the Resource Based View proposed that firms may earn above normal returns by identifying and acquiring resources that are critical to the development of demanded products.

In a progressive and better accepted view of the RBV, Prahalad and Hamel (1990) argued that the critical task of management was to create radical new products, which was enabled by the exploitative nature of the firm's core competences. Similarly to earlier authors like Penrose (1959) and Rubin (1973), Prahalad and Hamel (1990) focused not just on static resources but also the firm's inimitable skills, technologies and knowledge.

Barney (1991) drawing on earlier arguments based his expression of the RBV on two assumptions: that resources and capabilities are heterogeneously distributed among firms and that they are imperfectly mobile. These assumptions conjointly

allow for differences in firm resource endowments to exist and persist over time thereby allowing for a resource-based competitive advantage (Barney, 1991).

The dynamic capabilities framework was proposed by Teece, Pisano and Shuen (1997) to explain how a combination of competences and resources can be developed, deployed and protected. To do so, they defined a dynamic capability as the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments (Teece et al., 1997).

In his study, Newbert (2007) suggests that temporal research done under the auspices of resource heterogeneity approach shows that the trend toward examining capabilities and core competencies as opposed to resources is on the rise. The latter hints at the possibility of a response to advances in the theoretical literature and findings from empirical literature regarding the importance of capabilities and competencies relative to resources in determining a firm's competitive position (Newbert, 2007).

2.7 DIVERSIFICATION PERFORMANCE MEASURES

In literature, various studies utilize different measures of performance. A study conducted by (Pandaya & Rao, 1998) looked at the accounting and market variables. The performance measures used by (Pandaya & Rao, 1998) included accounting measures Return of Assets (ROA) and Return of Equity (ROE) as well as a Market measure of Market Return (MKTRET).

The concept of diversification does not lend itself to easy conceptualization and measurement. A variety of measures have been developed, but as Pitts and

Hopkins (1982) stress, the choice of measure must be guided by the research question at hand.

Early studies in industrial organization economics were concerned with the possible anti-competitive effects of diversification, and focused their attention on market structure variables. Using a public policy perspective, studies have examined the effect of diversification on such variables as concentration, industry growth and innovation. The finance literature has been concerned with testing the extent of portfolio risk reduction achieved by diversification from an investor's, as opposed to a managerial, point of view (Ramanujam & Varadarajan, 1989).

Accounting-based measures have been the primary focus of much of the strategic management research on diversification; however, there is at present a lively interest within the strategic management field in adopting market-based performance measures (Hitt and Ireland, 1987). The availability of alternative measures argues strongly for the use of an integrative view and reliance on multiple measures of effectiveness so that the accumulation of knowledge across disciplines can proceed (Ramanujam & Varadarajan, 1989).

For the purpose of this study, the Return of Assets (ROA); Return of Equity (ROE); and Price-Earnings Ratio variables will be used.

3. RESEARCH HYPOTHESES

Hypothesis testing as described by (Albright, Winston, & Zappe, 2009) is a form of decision making under uncertainty, where we decide which of the two competing hypotheses to accept based on sample data. They further elude to that the burden of the proof is traditionally on the alternative hypothesis and the null hypothesis will only be rejected if the results are of statistical significance.

The study examined the two measures of performance discussed in the literature review, namely ratio of Operating Profit to Total Equity and Market Return to determine if there is a significant relationship between the independent and joint effects of skill and physical bases of relatedness. The dependent variables used were the profitability measures and the independent variables were skill base, physical base and the joint effects of the two.

The following are the research hypotheses to be validated:

Research hypothesis 1: There is a positive relation between company physical relatedness and company financial performance.

Research hypothesis 2: There is a positive relation between company skill relatedness and company financial performance.

Research hypothesis 3: There is a positive relation between joint company physical and skill relatedness and company financial performance.

4. RESEARCH METHODOLOGY

4.1 RESEARCH DESIGN

The research design that was used is quasi-experimental. Blumberg, Cooper and Schindler (2008) note that the most important characteristics of experimental research is the researcher's ability to control the experimental setting and manipulate the independent variables as well as the random assignment of subjects to the experiment and control groups.

Quasi-experimental research as defined by Blumberg *et.al.* (2008) differs when the researcher cannot meet the prerequisites of true experiment as it is not feasible to assign subjects at random or to fully control the research setting.

For this study, the limited ability to classify all companies by SIC code and occupational levels due to limited company information forced the researcher to adopt a quasi-experimental design.

4.2 UNIT OF ANALYSIS

The unit of analysis as defined by (Blumberg, Cooper, & Schindler, 2008) is the level at which the research is performed and which objects are researched. In the research conducted, the unit of analysis was the organisations listed within the Industrial sector of the Johannesburg Securities Exchange (JSE) during the 10 year period 2000 to 2010.

4.3 POPULATION OF RELEVANCE

The population of relevance applied to the research was all the organisations listed in the Main board of the Johannesburg Securities Exchange within the Industrial sector. The population was limited to the industrial sector due to the following reasons:

- The sector consisted of a wide variety of companies operating across many sub-industries
- And avoidance of intricacies and complexities involved in other sectors such as Mining and Financial Services

4.4 SAMPLE SIZE AND SAMPLING METHOD

The sampling method that was employed in the research was a non-probability convenience sample. (Blumberg, Cooper, & Schindler, 2008) justify the use of non-probability samples because they meet the sampling objectives satisfactorily. The nature of the availability of data constrained the sampling method that could be utilized and hence non-probability sampling was deemed appropriate.

4.5 DETAILS OF DATA COLLECTION

The detail of data collection was divided into three categories:

- The first category was related to the collection of data to determine the physical base of relatedness and the qualification of diversification of the various organisations.

- The second category was related to the collection of data to determine the skills profiles of various industries within the sector.
- The third category was related to the collection of the performance data of the diversified organisations.

4.5.1 DATA TO DETERMINE LEVEL OF DIVERSIFICATION

Due to limited availability of SIC data in South Africa, similarly to Rushin (2006) and Subbramoney (2010), SIC categorization for this study was concluded at a three-digit level with validation against McGregor BFNNet. Investigation into a company's revenue/profit generation structure was required to determine the different business units that made up each of the listed companies. The business units were then classified using the SIC classification method into their industry categories. A three digit SIC classification was required to evaluate diversification of revenue generated.

Companies and Intellectual Property Commission (CIPC)'s SIC classifications listed on their website was considered a valid indication of SIC classification for South African companies. As a result of SIC codes not fully adopted in South Africa per company, a manual exercise was employed to classify and validate each company's SIC code.

Pandaya and Rao's specialization ratio was then used to validate companies as diversified. Pandaya and Rao (1998) modified Rumelt's index to determine the level of diversification by evaluating the quantum of revenue generated through

activities of a similar nature. For this investigation the focus was on determining only one category of diversified and not the finer degrees of related or unrelated diversification. Companies with specialization ratios less than 95% in 2000 and 2010 were deemed diversified, (Pandaya & Rao, 1998) classification as depicted in **Table 5.**

Table 5: Pandaya and Rao’s SR classification

Category	Pandaya and Rao’s SR Ratio
Single Business	SR \geq 0.95
Dominant Business (Moderately diversified organization)	0.5 < SR < 0.95
Related Business (Highly diversified organization)	SR < 0.5

Source: (Pandaya & Rao, 1998)

The following were excluded from the sample:

- Organisations not listed on JSE during 2000 to 2010
- Organisations outside of the Industrial sector as classified by on the JSE
- Organisations whose SR indicated a change from diversified to focused or other in 2000 and 2010.
- Organisations that had primary listing outside of South Africa
- Organisations that had a hybrid structure
- Organisations that did not report separate revenue streams to enable conclusions about business unit revenue

Skill information for organisations under investigation was based on secondary data sources to determine underlying skill profiles required within those industries.

4.5.2 DATA TO DETERMINE SKILL BASE OF RELATEDNESS IN DIVERSIFICATION

Secondary data sources such as studies that have been commissioned by Statistics South African (StatsSA) Occupational Skills Surveys were used to gather data to determine underlying skill profiles required per industry.

The skills relatedness of each company was calculated in five stages:

The first stage was conducted at an industry level: for every company, a cross tabulation was produced of all the SIC's and the Industry level Skills within those SIC's. For example, for Allied Electronics Corporation LTD, three SIC codes were listed as columns and the industry skills were listed as rows, so that the cross tabulation table comprised three columns of SIC's and as many rows as skills in the combined set of SIC's. Each cell of the cross tabulation provided the number of workers per skill level for each SIC at the industry level. Thus by looking across the SIC columns in any one row, the number of personnel with a particular skill was presented across the SIC's of a company.

The second stage was conducted at the company level by evaluating the relative contributions of the SIC's of each company based on the percentage revenue generated per SIC in 2010 (segmental reporting). For example, for Allied Electronics Corporation LTD, the three SIC codes were 366, 752 and 869, with percentage 2010 revenue generated by each at 54 %, 25% and 15% respectively. Thus the number of workers per SIC were re-based to obtain the relative or weighted skills according to the company profile. Although, at this stage, the

number of workers were still based at industry level, the totals skills for each company were based on the relative contribution of the SIC's of each company.

The third stage was the calculation of the total skills, still at industry level, per company. This total was calculated by summing the number of workers in the re-based SIC's per company.

The fourth stage was the calculation of shared skills or common "pools" of skills, still at industry level, per company. Skills were considered as common or shared if in any one row, the same skill appeared across the re-based SIC's. By summing only those skills across SIC's with common skills, the total number of shared skills was obtained, i.e., the number of workers with common skill per company, this number still at company re-based industry level.

The fifth and final stage was to calculate per company, the ratio of the number of shared skills (from the fourth stage), to the total skills (from the third stage) to yield the percentage of shared skills per company.

The percentage of shared skills per company became one of the independent variables of the study to predict the dependent variable, company performance.

4.5.3 DATA TO DETERMINE PHYSICAL BASE OF RELATEDNESS IN DIVERSIFICATION

The main criterion for classifying industries as related is the physical attributes of the products. The categorization and product count approach (SIC) was incorporated into the study to determine the physical-base of relatedness.

The physical relatedness measure used was Pandaya & Rao's (1998) average specialization ratio with SR between 50 and 95 indicating a moderately diversified company and an SR between 0 and 50 indicating a highly diversified company.

4.5.4 PERFORMANCE DATA

The performance data used was secondary data. (Blumberg, Cooper, & Schindler, 2008) define secondary data as information or data that has already been collected and recorded by someone else, usually for other purposes. The performance data was obtained from McGregor's Bureau of Financial Analysis (BFANet) database, which is a vendor that supplies financial data relating to listed companies.

The various performance data definitions and timeframes are listed below:

4.5.4.1 RETURN ON ASSETS

Key performance variables were extracted from available secondary data sources. Methods of calculation were assumed to be correct and consistent across all companies. Where key performance measures were not readily available, key variables that were used in the formulation of those variables were extracted and the relevant ratios calculated.

Data was obtained from McGregor's BFANet database. The Return on Assets % (ROA) data was obtained per organisation for the year 2010. The definition of ROA % used by McGregor was:

$$\text{ROA}\% = \frac{\text{Investment Income} + \text{Operating Profit} + \text{Interest Received} + \text{Associate Income}}{\text{Total Assets}} \times 100$$

4.5.4.2 RETURN ON EQUITY

Key performance variables were extracted from available secondary data sources. Methods of calculation were assumed to be correct and consistent across all companies. Where key performance measures were not readily available, key variables that were used in the formulation of those variables were extracted and the relevant ratios calculated.

Data was obtained from McGregor's BFANet database. The Return on Equity % (ROE) data was obtained per organisation for the year 2010. The definition of ROE % used by McGregor was:

$$\text{ROE\%} = \frac{\text{Profit attributable to ordinary shareholders}}{(\text{Ordinary shareholders interest} + \text{Directors loans} + \text{Shareholders loans})} \times 100$$

4.5.4.3 PRICE-EARNINGS RATIO

The Price-Earnings (P/E) Ratio data was obtained from the McGregor's BFANet database. The data was obtained per organisation for the year 2010. The calculation of the Price-Earnings (P/E) Ratio as used by McGregor expresses the share price as a "multiple" of earnings – high is expensive, low is cheap and was calculated as follows:

$$\text{Price Earnings (P/E) Ratio} = \frac{\text{Share Price}}{\text{EPS (earnings per share)}}$$

4.6 PROCESS OF DATA ANALYSIS

The process of analysis that was followed utilized both descriptive and inferential statistics to perform the analysis on the data and various outputs. Descriptive statistics according to (Welman, Kruger, & Mitchell, 2005) are concerned with the description or summary of the data obtained for a group of individual units of analysis and inferential statistics are concerned with inferences that can be made about a population based on corresponding indices obtained from samples.

4.6.1 DESCRIPTIVE STATISTICS

Descriptive statistics for each of the performance measures by skill base, physical base and a combination were calculated. The descriptive statistics that were calculated were the mean, median, standard deviation, minimum, maximum, skewness and mode. The definitions are listed in the **Table 6**:

Table 6: Elements of Descriptive Statistics

Statistical Element	Description
n	The amount of occurrences within the sample
Mean	The average score for a group equal to the total individual scores divided by the number of scores
Median	The middle value in an ordered array of numbers
Standard Deviation	A determination if scores on a parametric test are evenly distributed.
Minimum	The smallest value in a set of numbers
Maximum	The largest value in a set of numbers
Skewness	The lack of symmetry of a distribution of values
Mode	The score achieved by the greatest number of units of analysis

Source: (Welman, Kruger, & Mitchell, 2005)

4.6.2 INFERENCE STATISTICS

The inferential statistics selected to make inferences on the population based on the sample was by means of hypothesis testing.

4.6.2.1 HYPOTHESIS TESTING

Correlation and scatterplots were utilized to understand the relationship between relatedness and organisational performance. As stated by Albright (2009), correlations have the attractive property that they are completely unaffected by the units of measurement although their limitation is in only measuring the strength of linear relationships.

A correlation coefficient (r) is a number that gives a numeric indication of the strength of a relationship between two variables. It summarises the information in scatter plots. A correlation matrix is the standard form of reporting correlation results (Albright, Winston, & Zappe, 2009).

The correlation coefficient (r) gives a simple way to measure the strength and direction of the relationship and always lies between 1 and -1. If r is positive, then the regression line has a positive slope. A correlation which equals zero or near zero indicates practically no relationship between variables (Albright, Winston, & Zappe, 2009).

In this study, each of the independent and dependent variables were obtained and analysed for trends and abnormalities. Thereafter, simple descriptive statistics were calculated for each variable. Detailed analysis was conducted using a

statistical package called STATISTICA (Statsoft, Inc, 2011) with a correlation matrix used to present the data.

Regression analysis was not used to prove or disprove the hypotheses for each of the performance measures against the independent variables due to the sample size being too small and not allowing for multivariate levels.

According to Zikmund (2003) the process to be followed in testing a hypothesis is as follows:

- The null hypothesis (H_0) was stated
- The alternate hypothesis (H_1) was stated
- The significance level alpha (α) was chosen
- The sample size (N) was chosen
- The p -value was needed to be calculated and compared against the significant alpha (α) level
 - If $p \geq \alpha$, the null hypothesis (H_0) would not be rejected
 - If $p < \alpha$, the null hypothesis (H_0) would be rejected

4.7 LIMITATIONS OF THE RESEARCH

The list below is a summary of the limitations of this study:

- The study was only limited to one sector and its subsequent industries with the JSE. An examination of all listed organisations could have been supreme.
- The manual intervention that was required to determine the level of diversification through SIC code classification opened up the study to some level of subjectivity.
- The assumption made that the methods of calculation were correct and consistent across all companies (where key performance measures were not readily available; and key variables were used in the formulation of those variables and the relevant ratios calculated).
- Levels of diversification were validated at the beginning and end of review period and assumed to remain constant for the full review period.
- The study was confined to listed companies which could result in different results if applied to unlisted companies or multinationals with primary listings outside of South Africa.

5. RESULTS

The results of the research are divided into four sections. The first section **(5.1)** shows the results of the independent classification of the organisations as diversified organisations using a combination of the SIC classification and the Specilisation Ratio methods. The second section **(5.2)** shows the results of relatedness for both skills and physical bases. The third section **(5.3)** shows the results of the performance data obtained from the McGregor BFANet database. The fourth section **(5.4)** presents the relation between the relatedness data and the performance data of the companies and hereby tests the hypotheses of the study.

5.1 COMPANY CATEGORISATION

A summary of the results of the independent classification of organisations into diversified are reflected in **Table 7**.

Table 7: Diversified Organisations

Organisation Name	3 - Digit Sic Code (2000)	2000 SR	3 - Digit Sic Code (2010)	2010 SR
ALLIED ELECTRONICS CORPORATION LTD	366	34.0%	366	54.0%
	752	30.0%	752	25.0%
	869	26.0%	869	15.0%
BARLOWORLD LIMITED	342	7.7%	342	
	351	5.0%	351	
	355	8.8%	355	
	356	28.0%	356	88.0%
	504		504	
	615	7.7%	615	7.6%
	631	27.0%	631	2.0%
DIGICORE HOLDINGS LIMITED	712	14.0%	712	1.2%
	741		741	78.0%
	752		752	11.0%
EXCELLERATE HOLDINGS LIMITED	865		865	12.0%
	612		612	50.0%
HOWDEN AFRICA HOLDINGS LIMITED	642		642	47.0%
	356	71.0%	356	84.0%
	357	28.0%	357	15.0%

Organisation Name	3 - Digit Sic Code (2000)	2000 SR	3 - Digit Sic Code (2010)	2010 SR
HUDACO INDUSTRIES LIMITED	357	39.0%	357	29.0%
	374	60.0%	374	70.0%
ILIAD AFRICA LIMITED	342		342	27.0%
	614		614	72.0%
IMPERIAL HOLDINGS LIMITED	631	37.0%	631	28.0%
	741	53.0%	741	66.0%
	821	7.1%	821	5.0%
JASCO ELECTRONICS HOLDINGS LIMITED	752		752	20.0%
	869		869	79.0%
INVICTA HOLDINGS LIMITED	356		356	50.0%
	357		357	44.0%
MICROMEGA HOLDINGS LIMITED	819		819	51.0%
	831		831	49.0%
SUPER GROUP LIMITED	633	55.0%	633	40.0%
	712	34.0%	712	59.0%
	819	9.6%	819	
	889		889	
THE BIDVEST GROUP LIMITED	323	9.0%	323	
	325		325	1.8%
	642	48.0%	642	51.0%
	721	37.0%	721	1.4%
	741		741	
	819	1.4%	819	17.0%
	889	3.6%	889	15.0%
CONTROL INSTRUMENTS GROUP LIMITED	862	87.8%	862	48.0%
	863		863	
	869	12.2%	869	52.0%
GRINDROD LIMITED	712	13.3%	712	8.7%
	721	84.6%	721	14.0%
	741	2.0%	741	76.6%
GROUP FIVE LIMITED	501	5.4%	501	5.2%
	502	75.0%	502	82.0%
	503	19.3%	503	12.0%
METROFILE HOLDINGS LIMITED	861		861	
	862	37.0%	862	79.0%
	863		863	
	864		864	
	865	62.0%	865	17.0%
PRETORIA PORTLAND CEMENT COMPANY LD	869	0.3%	869	5.0%
	251	16.5%	251	10.0%
REUNERT LIMITED	335	13.0%	335	4.3%
	342	70.0%	342	85.0%
	615	30.0%	615	64.0%
REUNERT LIMITED	615	18.0%	615	27.0%
	752	51.0%	752	7.4%

Source: McGregor BFANet

Above are the 19 diversified organisations against which the three-digit SIC code for the largest contributing segment to the revenue of the organization is listed. The three-digit SIC code for the year 2000 with the corresponding SR is listed as well as the three-digit SIC code and corresponding SR for the year 2010, to ensure that the organization remained diversified at the beginning of the period and at the end of the period of study.

A total of 71 organisations were listed in the industrial sector of the JSE (see **Appendix 1: Industrial Sector JSE**). A portfolio comprising of 19 diversified organisations was compiled to form the sample of the study. The balance of the organisations, comprising of 52 organisations (see **Appendix 2: Rejected from sample with reasons** for more detail) were excluded from the sample due to the following key reasons:

- Organisations which obtained their JSE listings after 2000 were not included in the sample – **Listed after 2000**. An example of an organisation is:
 - Sanyati Holdings Limited which listed in 2006.
- The organisations that did not remain constantly diversified at the start of the study period compared to the end of the period - **Change in Strategy**. An example of an organisation is:
 - Adcorp Holdings Limited whose SR was 0.73 in 2000 and 0.95 in 2010.
- Organisations that did not have their primary listing in South Africa were not included in the sample - **International Listing**. An example of an organisation is:
 - CAFCA LTD as the primary listing is in Zimbabwe.

- Organisations with no SIC codes available – **No SIC codes**. An example of an organisation is:

- Bowler Metcalf Limited with no SIC codes listed.

- Organisations that did not report their segmented revenues sufficiently or did so by geography limiting the ability to link the revenues with a particular three-digit SIC code for the start and end of the review period – **No segmental reporting**.

An example of an organisation is:

- Masonite (Africa) Limited did not report revenues per segment in 2000.

5.2 RELATEDNESS RESULTS

The results pertaining to the physical and skills relatedness data are summarised in **Table 8**. This table presents relatedness measures both in terms of skill and physical bases for the 19 diversified organisations. The skills data obtained from the 2010 Q4 quarterly labour force survey conducted by StatsSA was mapped against each organisation's SIC code to determine overlap of skills within the same organisation (see **Appendix 3: Calculation of skill relatedness** for more detail). The percentage of shared skills per company became one of the independent variables of the study to predict the dependent variable, company performance.

The physical relatedness measure used was Pandaya & Rao's (1998) average specialization ratio with SR between 51 and 95 indicating a moderately diversified company and an SR between 0 and 50 indicating a highly diversified company. Out of a sample of 19, 13 organisations were classified as moderately diversified with the remaining six organisations classified as highly diversified.

Table 8: Relatedness in Diversified Organisations

	Skill Relatedness		Physical Relatedness
	% Shared skills 2010	Number of active SICs 2010	Average Specialisation Ratio (SR)
ALLIED ELECTRONICS CORPORATION LTD	38.7%	3	44%
BARLOWORLD LIMITED	79.4%	4	58%
DIGICORE HOLDINGS LIMITED	37.7%	3	78%
EXCELLERATE HOLDINGS LIMITED	30.4%	2	50%
HOWDEN AFRICA HOLDINGS LIMITED	45.1%	2	77%
HUDACO INDUSTRIES LIMITED	29.7%	2	65%
ILIAD AFRICA LIMITED	53.1%	2	72%
IMPERIAL HOLDINGS LIMITED	59.8%	3	59%
JASCO ELECTRONICS HOLDINGS LIMITED	47.5%	2	79%
INVICTA HOLDINGS LIMITED	46.0%	2	50%
MICROMEGA HOLDINGS LIMITED	40.2%	2	51%
SUPER GROUP LIMITED	20.8%	2	59%
THE BIDVEST GROUP LIMITED	68.6%	5	49%
CONTROL INSTRUMENTS GROUP LIMITED	60.7%	2	67%
GRINDROD LIMITED	60.2%	3	49%
GROUP FIVE LIMITED	36.2%	3	78%
METROFILE HOLDINGS LIMITED	71.1%	3	58%
PRETORIA PORTLAND CEMENT COMPANY LD	47.5%	3	77%
REUNERT LIMITED	52.9%	2	47%

5.3 PERFORMANCE MEASURE RESULTS

The results section of the performance data is divided into three sections. The first section presents the results of the data that was obtained from McGregor's BFANet database, the second sections presents the descriptive statistics of the performance measures and the third section presents the results of the hypothesis testing.

5.3.1 PERFORMANCE DATA

The performance data obtained from McGregor's BFANet database are presented below per performance measurement for 2010.

5.3.1.1 RETURN ON ASSETS

The Return on Assets % (ROA) for each diversified organisation for 2010 can be viewed in **Table 9**.

Table 9 : ROA % of the Diversified Organisations

Organisation	2010 ROA %
ALLIED ELECTRONICS CORPORATION LTD	14.93
BARLOWORLD LIMITED	5.23
DIGICORE HOLDINGS LIMITED	15.96
EXCELLERATE HOLDINGS LIMITED	15.19
HOWDEN AFRICA HOLDINGS LIMITED	18.51
HUDACO INDUSTRIES LIMITED	13.46
ILIAD AFRICA LIMITED	5.7
IMPERIAL HOLDINGS LIMITED	11.25
JASCO ELECTRONICS HOLDINGS LIMITED	9
INVICTA HOLDINGS LIMITED	15.17
MICROMEGA HOLDINGS LIMITED	5.35
SUPER GROUP LIMITED	8.3
THE BIDVEST GROUP LIMITED	15.03
CONTROL INSTRUMENTS GROUP LIMITED	2.95
GRINDROD LIMITED	8.3
GROUP FIVE LIMITED	7.13
METROFILE HOLDINGS LIMITED	29.75
PRETORIA PORTLAND CEMENT COMPANY LD	34.67
REUNERT LIMITED	17.52

Source: McGregor BFANet

5.3.1.2 RETURN ON EQUITY

The Return on Equity % (ROE) for each diversified organisation for 2010 can be viewed in **Table 10**.

Table 10: ROE % of the Diversified Organisations

Organisation	2010 ROE %
ALLIED ELECTRONICS CORPORATION LTD	11.4
BARLOWORLD LIMITED	-1.73
DIGICORE HOLDINGS LIMITED	9.53
EXCELLERATE HOLDINGS LIMITED	10.13
HOWDEN AFRICA HOLDINGS LIMITED	40.18
HUDACO INDUSTRIES LIMITED	16.8
ILIAD AFRICA LIMITED	5.09
IMPERIAL HOLDINGS LIMITED	16.35
JASCO ELECTRONICS HOLDINGS LIMITED	7.59
INVICTA HOLDINGS LIMITED	22.24
MICROMEGA HOLDINGS LIMITED	2
SUPER GROUP LIMITED	5.63
THE BIDVEST GROUP LIMITED	19.91
CONTROL INSTRUMENTS GROUP LIMITED	0.76
GRINDROD LIMITED	13.32
GROUP FIVE LIMITED	10.75
METROFILE HOLDINGS LIMITED	21.98
PRETORIA PORTLAND CEMENT COMPANY LD	130.07
REUNERT LIMITED	20.25

Source: McGregor BFANet

5.3.1.3 PRICE-EARNINGS RATIO

The Price-Earnings (P/E) Ratio for diversified organisations for 2010 can be viewed in

Table 11.

Table 11: Price-Earnings Ratio of the Diversified Organisations

Organisation	2010 PE
ALLIED ELECTRONICS CORPORATION LTD	13.51
BARLOWORLD LIMITED	26.07
DIGICORE HOLDINGS LIMITED	14.15
EXCELLERATE HOLDINGS LIMITED	6.57
HOWDEN AFRICA HOLDINGS LIMITED	9.8
HUDACO INDUSTRIES LIMITED	10.65
ILIAD AFRICA LIMITED	20.74
IMPERIAL HOLDINGS LIMITED	9.19
JASCO ELECTRONICS HOLDINGS LIMITED	7.71
INVICTA HOLDINGS LIMITED	6.12
MICROMEGA HOLDINGS LIMITED	6
SUPER GROUP LIMITED	10.69
THE BIDVEST GROUP LIMITED	11.99
CONTROL INSTRUMENTS GROUP LIMITED	46
GRINDROD LIMITED	11.1
GROUP FIVE LIMITED	5.66
METROFILE HOLDINGS LIMITED	10.99
PRETORIA PORTLAND CEMENT COMPANY LD	13.83
REUNERT LIMITED	11.81

Source: McGregor BFANet

5.3.2 DESCRIPTIVE STATISTICS OF PERFORMANCE MEASURES

The descriptive statistics relating to the performance measures are summarised in **Table 12**. The aim of the research was to present and test all observable (n = 19) data points for each financial measure since these observations represent actual financial data that was recorded by the organisations.

	Mean	95% Confidence Interval for the mean	Median	Mode	Frequency of Mode	Minimum	Maximum	Std Dev	Skewness
2010 ROA %	13.3	9.40	13.46	8.3	2	2.95	34.6	8.15	1.28
2010 ROE%	19.0	5.29	11.4	Multi	1	-1.73	130	28.5	3.58
2010 P/E	13.2	8.76	10.99	Multi	1	5.66	46	9.3	2.67

Table 12: Descriptive statistics of performance measures

Table 12 highlights descriptive statistics for each of the three performance measures (Return of Assets % (ROA), Return on Equity % (ROE) and Price-Earnings (P/E) Ratio) for the year 2010 that were tested.

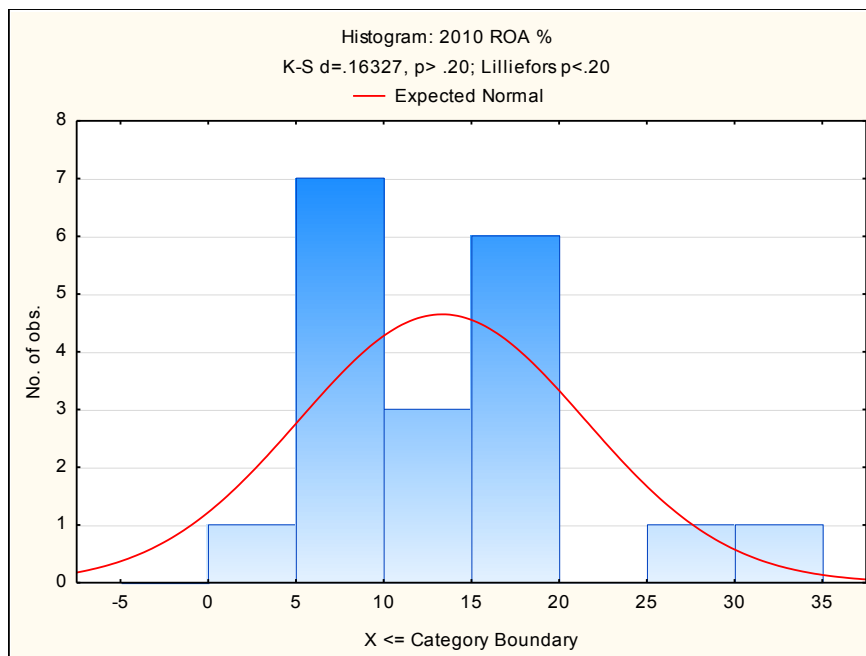


Figure 1: Histogram 2010 ROA%

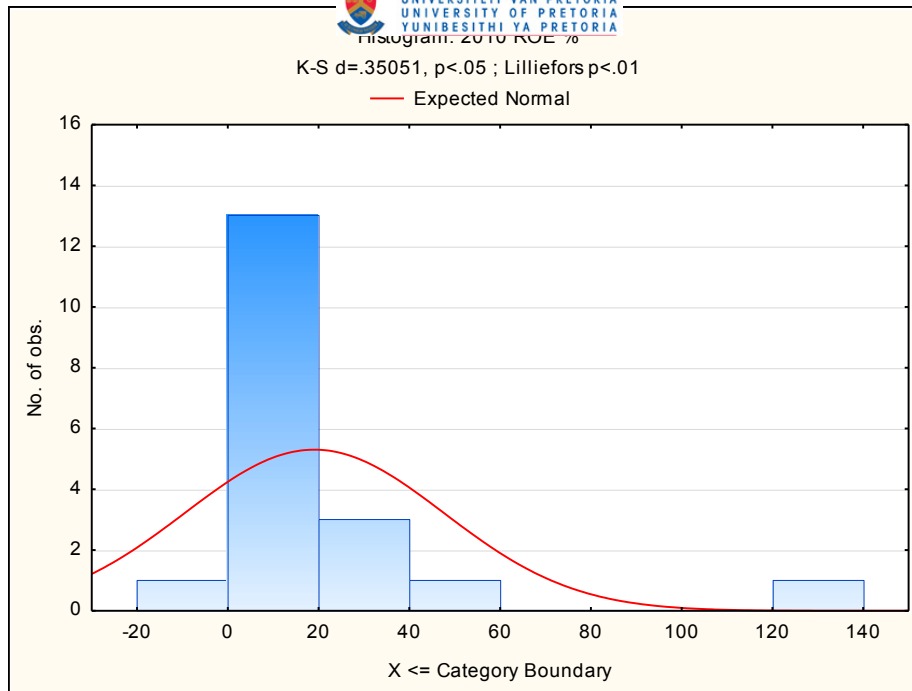


Figure 2: Histogram 2010 ROE%

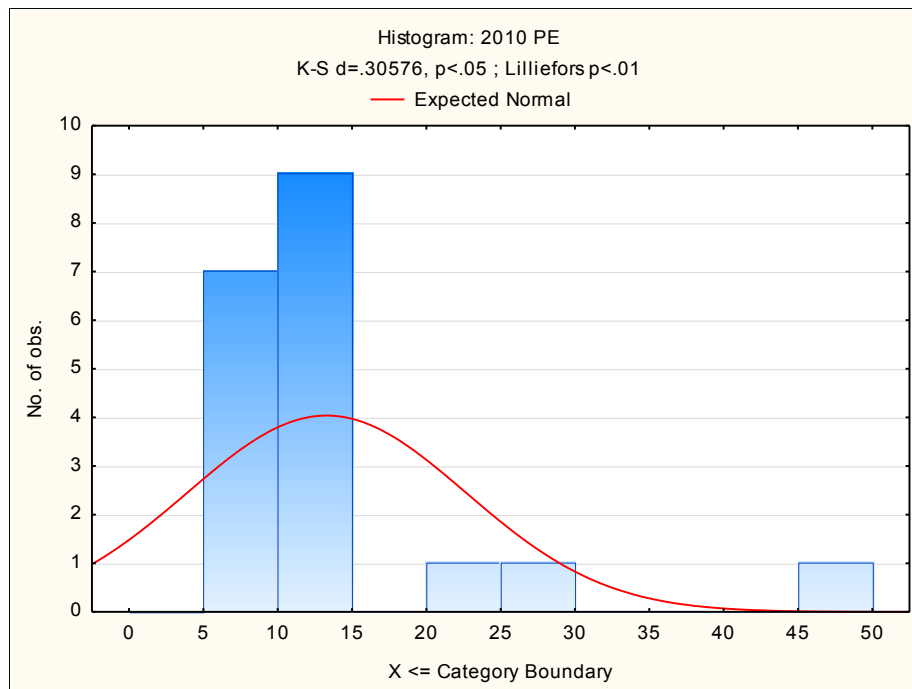


Figure 3: Histogram 2010 P/E

Figure 1 to 3 presents the descriptive graphs (Histograms) indicating the distribution of each of the financial performance measures of the sample.

5.4 HYPOTHESIS TEST RESULTS

The results of the three hypothesis tests are presented below. The results include tests of the parametric Pearson Product Moment correlation coefficient and the Spearman Rank Order non-parametric correlation. Both parametric and non-parametric test were computed because the sample was small and the data could not be assumed to be normally distributed.

At the outset, the three research hypotheses of the study are stated. These hypotheses examine the relations between three levels of relatedness within companies and financial performance. These hypotheses are referred to as Level 1 hypotheses, as they are stated prior to splitting financial performance into three measures (ROA, ROE and P/E). When they are stated in terms of each specific measure of company performance, they are referred to as Level 2. Each of the Level 1 hypotheses are addressed in section **5.4.1.1**, **5.4.1.2** and **5.4.1.3** respectively.

Research hypothesis 1: There is a positive relation between company physical relatedness and company performance

Research hypothesis 2: There is a positive relation between company skill relatedness and company financial performance

Research hypothesis 3: There is a positive relation between company joint physical and skill relatedness and company financial performance

The corresponding statistical null and alternate hypotheses are tabulated (in **Table 13**) for clarity and completeness.

Table 13: Level 1 and 2 Null and Alternative Hypotheses

Level 1 Null and alternative Hypotheses		Level 2 Null and alternative Hypotheses	
1	<p>H₀: The level of related diversification as indicated by the physical base of relatedness will not be related to financial performance.</p> <p>H₁: The level of related diversification as indicated by the physical base of relatedness is positively related to financial performance.</p>	1a	<p>H₀: The level of companies' related diversification as indicated by their physical base of relatedness is not correlated with company ROA.</p> <p>H₁: The level of related diversification of companies as indicated by their physical base of relatedness is positively correlated with their ROA.</p>
		1b	<p>H₀: The level of companies' related diversification as indicated by their physical base of relatedness is not correlated with company ROE.</p> <p>H₁: The level of related diversification of companies as indicated by their physical base of relatedness is positively correlated with their ROE.</p>
		1c	<p>H₀: The level of companies' related diversification as indicated by their physical base of relatedness is not correlated with company P/E.</p> <p>H₁: The level of related diversification of companies as indicated by their physical base of relatedness is positively correlated with their P/E.</p>
2	<p>H₀: The level of related diversification as indicated by the skill base of relatedness will not be related to financial performance.</p> <p>H₁: The level of related diversification as indicated by the skill base of relatedness is positively related to financial performance</p>	2a	<p>H₀: The level of companies' related diversification as indicated by their skill base of relatedness is not correlated with company ROA.</p> <p>H₁: The level of related diversification of companies as indicated by their skill base of relatedness is positively correlated with their ROA.</p>
		2b	<p>H₀: The level of companies' related diversification as indicated by their skill base of relatedness is not correlated with company ROE.</p> <p>H₁: The level of related diversification of companies as indicated by their skill base of relatedness is positively correlated with their ROE.</p>
		2c	<p>H₀: The level of companies' related diversification as indicated by their skill base of relatedness is not correlated with company P/E.</p> <p>H₁: The level of related diversification of companies as</p>



Level 1 Null and alternative Hypotheses		Level 2 Null and alternative Hypotheses	
			indicated by their skill base of relatedness is positively correlated with their P/E.
3	<p>H₀: The level of related diversification as indicated jointly by the skill and physical bases of relatedness will not be related to financial performance.</p> <p>H₁: The level of related diversification as indicated jointly by the skill and physical bases of relatedness is positively related to financial performance</p>	3a	<p>H₀: The level of companies' related diversification as indicated jointly by their skill and physical bases of relatedness is not correlated with company ROA.</p> <p>H₁: The level of related diversification of companies as indicated jointly by their skill and physical bases of relatedness is positively correlated with their RAO.</p>
		3b	<p>H₀: The level of companies' related diversification as indicated jointly by their skill and physical bases of relatedness is not correlated with company ROE.</p> <p>H₁: The level of related diversification of companies as indicated jointly by their skill and physical bases of relatedness is positively correlated with their ROE.</p>
		3c	<p>H₀: The level of companies' related diversification as indicated jointly by their skill and physical bases of relatedness is not correlated with company P/E.</p> <p>H₁: The level of related diversification of companies as indicated jointly by their skill and physical bases of relatedness is positively correlated with their P/E.</p>

5.4.1.1 HYPOTHESIS 1:

The null hypothesis (H₀):

H₀: The level of related diversification as indicated by the physical base of relatedness will not be related to financial performance.

The alternative hypothesis (H₁):

H₁: The level of related diversification as indicated by the physical base of relatedness is positively related to financial performance.

The **figures 4 to 6** represent the relation between company physical relatedness and company performance as measured by ROA, ROE and P/E.

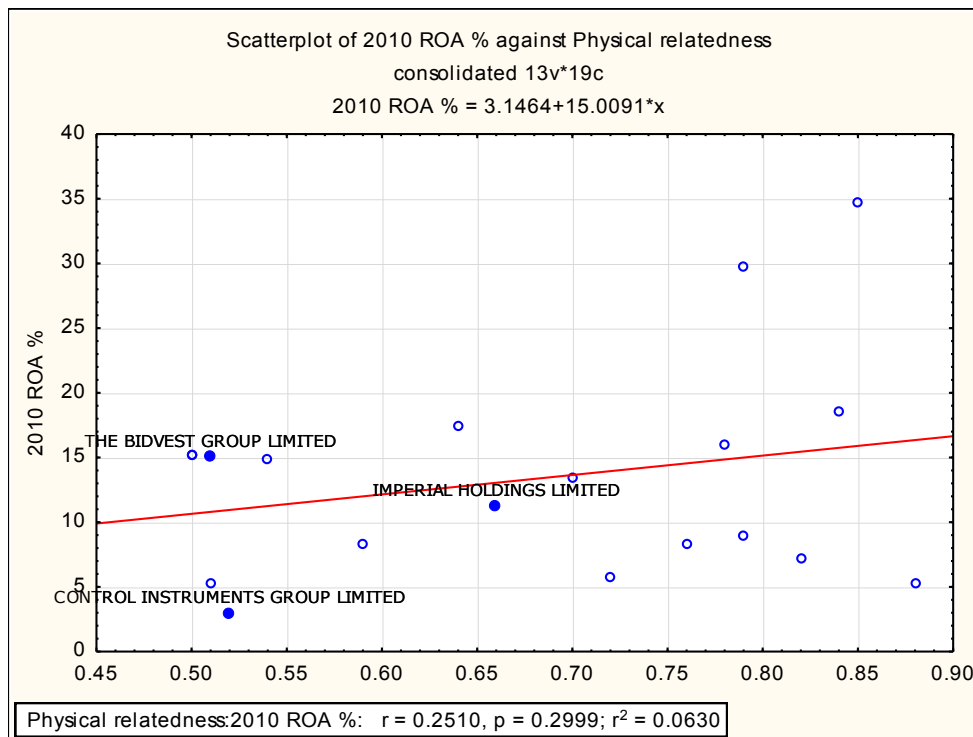


Figure 4: Scatter plot of 2010 ROA% against Physical Relatedness

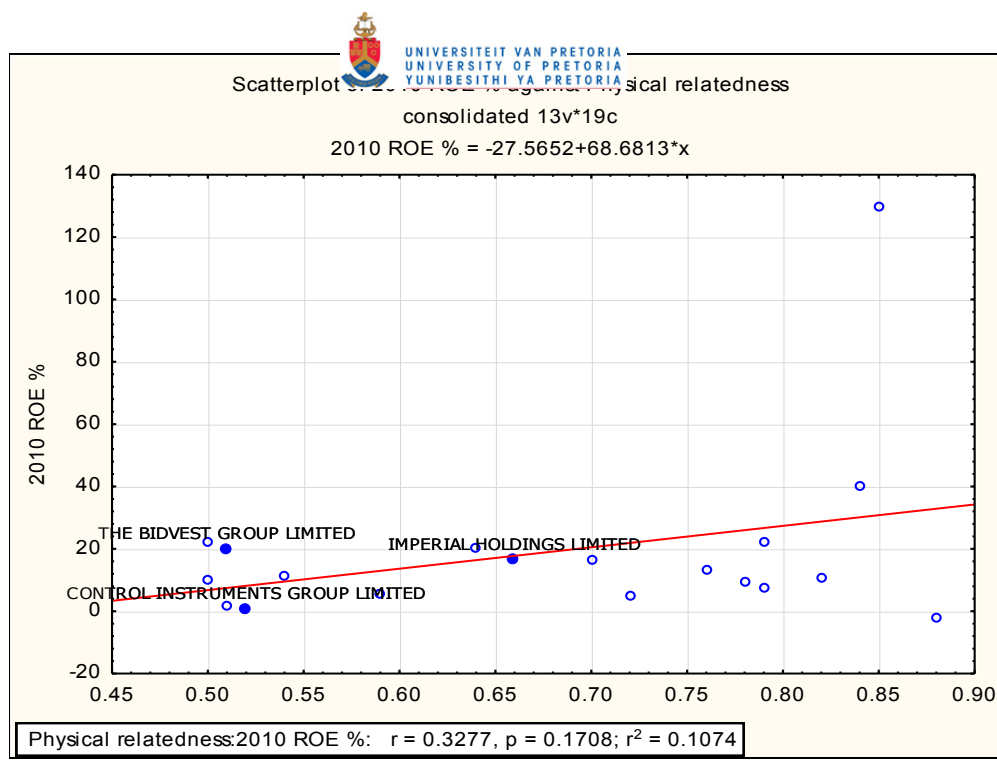


Figure 5: Scatter plot of 2010 ROE% against Physical Relatedness

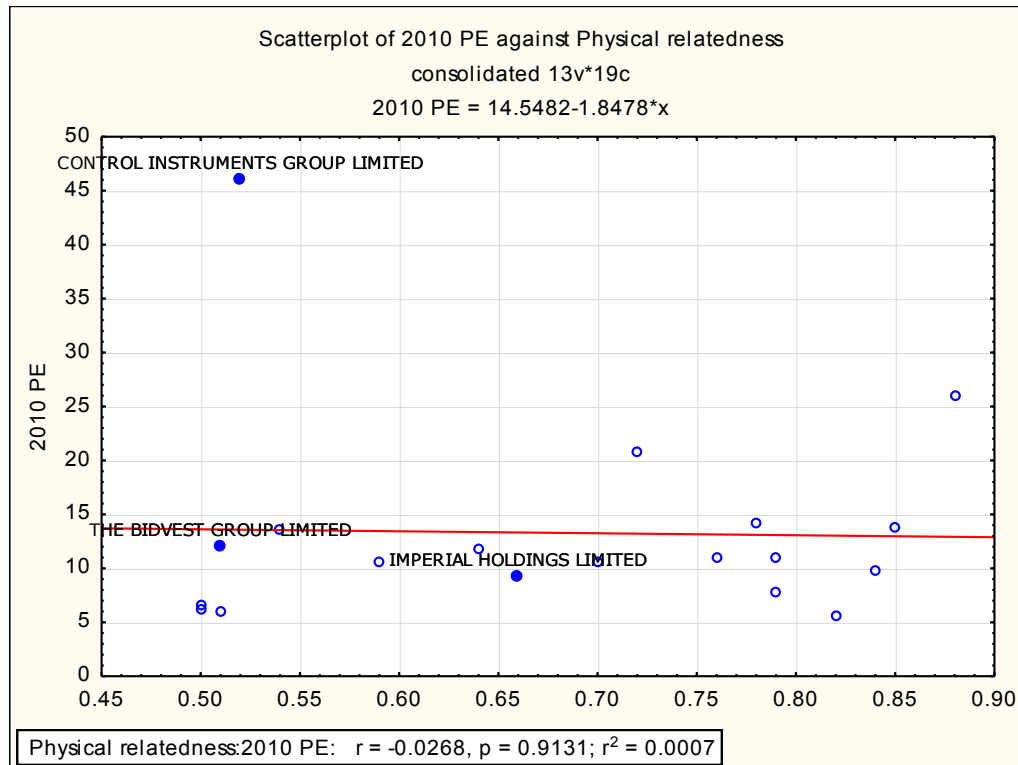


Figure 6: Scatter plot of 2010 P/E against Physical Relatedness

Table 14: Pearson Parametric Test (Physical Relatedness)

All correlations are not significant ($p > 0.05$).

	r	p
ROA	0.251	0.2999
ROE	0.328	0.1708
P/E	-0.027	0.9131

Table 15: Spearman Non-Parametric Test (Physical Relatedness)

All correlations are not significant ($p > 0.05$).

	r
ROA	0.108
ROE	0.100
P/E	0.222

Hypothesis 1 Conclusion

Based on the scatter plots, and the values of the parametric and non-parametric correlations, no significant relations were found between physical relatedness and the three measures of company performance ($p > 0.05$). Thus there is no indication of a significant relation between physical relatedness as defined in this study and the performance measures considered i.e. ROA, ROE and PE. Thus the Null hypotheses (Ho1a, Ho1b, and Ho1c) cannot be rejected for Hypothesis 1.

5.4.1.2 HYPOTHESIS 2:

The null hypothesis (H₀):

Ho: The level of related diversification as indicated by the skill base of relatedness will not be related to financial performance.

The alternative hypothesis (H₁):

H₁: The level of related diversification as indicated by the skill base of relatedness is positively related to financial performance.

The **figures 7 to 9** represent the relation between company skill relatedness and company performance as measured by ROA, ROE and P/E.

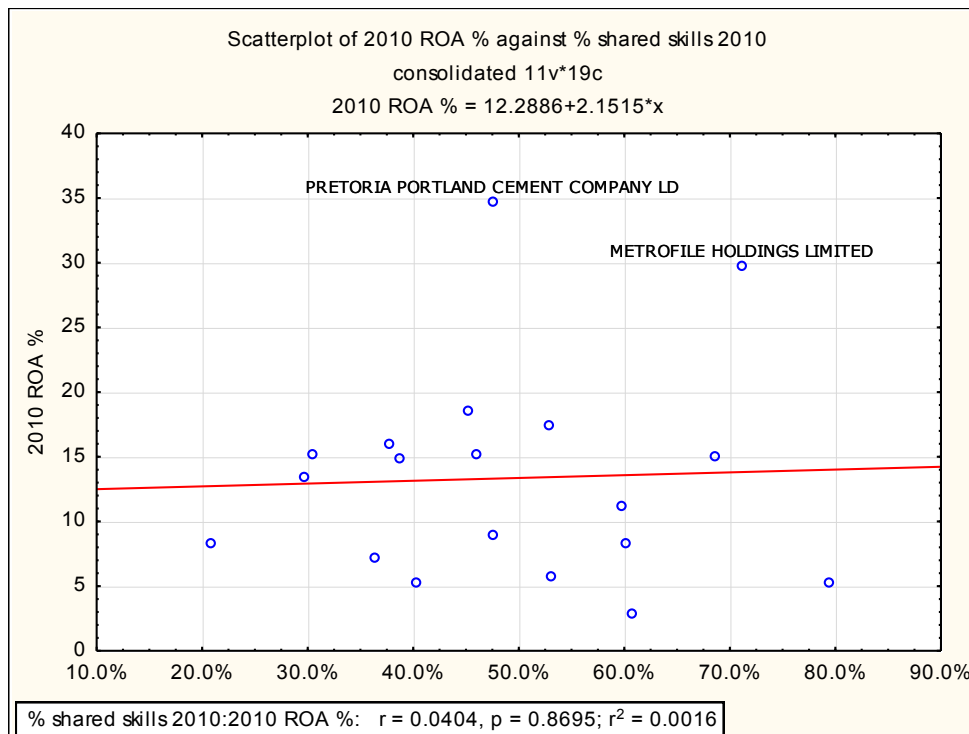


Figure 7: Scatter plot of 2010 ROA% against Skill Relatedness

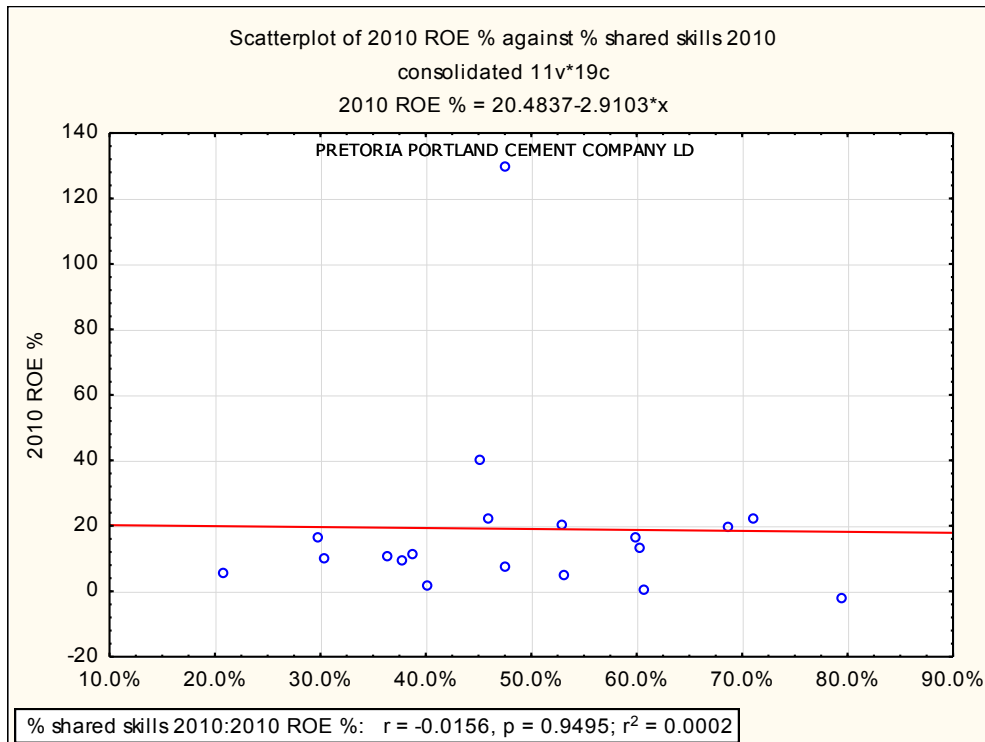


Figure 8 : Scatter plot of 2010 ROE% against Skill Relatedness

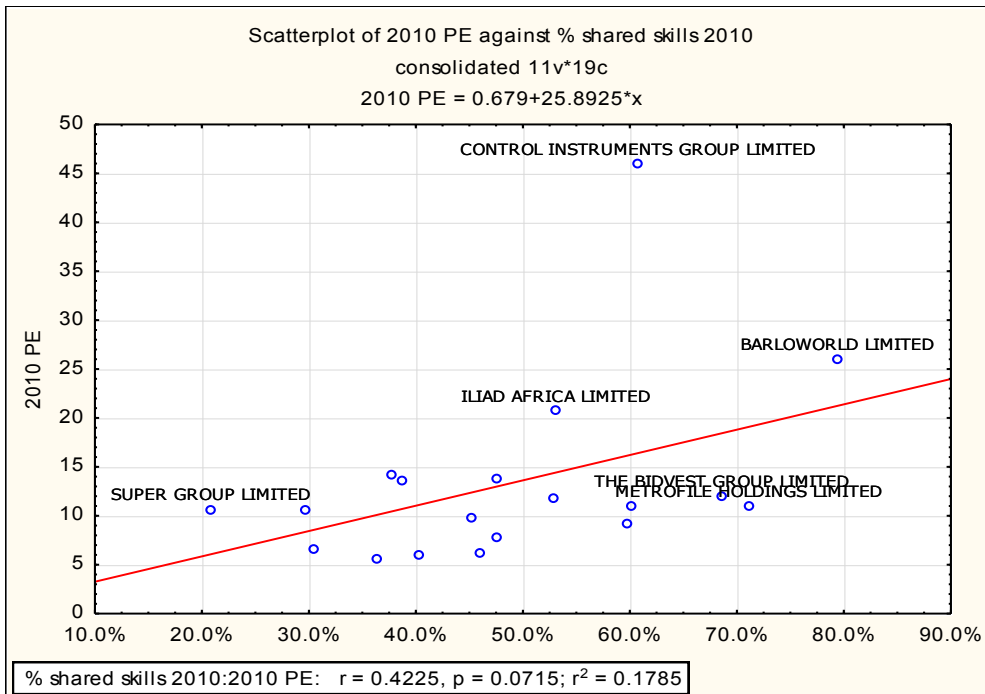


Figure 9: Scatter plot of 2010 P/E against Skill Relatedness

Table 16: Pearson Parametric Test (Skill Relatedness)

All correlations are not significant ($p > 0.05$).

	r	p
ROA	0.040	0.8695
ROE	-0.016	0.9495
P/E	0.423	0.0715

Table 17: Spearman Non-Parametric Test (Skill Relatedness)

All correlations are not significant ($p > 0.05$).

	r
ROA	-0.121
ROE	0.004
P/E	0.470

Hypothesis 2 Conclusion

Based on the scatter plots, and the values of the parametric and non-parametric correlations between the percentage of shared skills of companies and their P/E's, it can be said that there is some indication of a significant, although weak, positive relation between the ranks of the percentage of shared skills of companies and the ranks of their P/E's. Although the parametric correlation, based on the actual values rather than the ranked values, is significant only at the 10% level, this relation between shared skills and P/E cannot be ignored.

However, no other significant relations were found between skill relatedness and ROA and ROE, the other two measures of company performance ($p > 0.05$). Thus there is only weak partial evidence of a significant relation between skills relatedness as defined in this study and the performance measure of PE. Thus the Null hypotheses (Ho2a, Ho2b, and Ho2c) cannot be rejected for Hypothesis 2.

5.4.1.3 HYPOTHESIS 3:

The null hypothesis (H_0):

H_0 : The level of related diversification as indicated jointly by the physical and skill bases of relatedness will not be related to financial performance.

The alternative hypothesis (H_1):

H_1 : The level of related diversification as indicated jointly by the physical and skill bases of relatedness is positively related to financial performance.

The **figures 10 to 12** represent the relation between company physical and skill relatedness and company performance as measured by ROA, ROE and P/E.

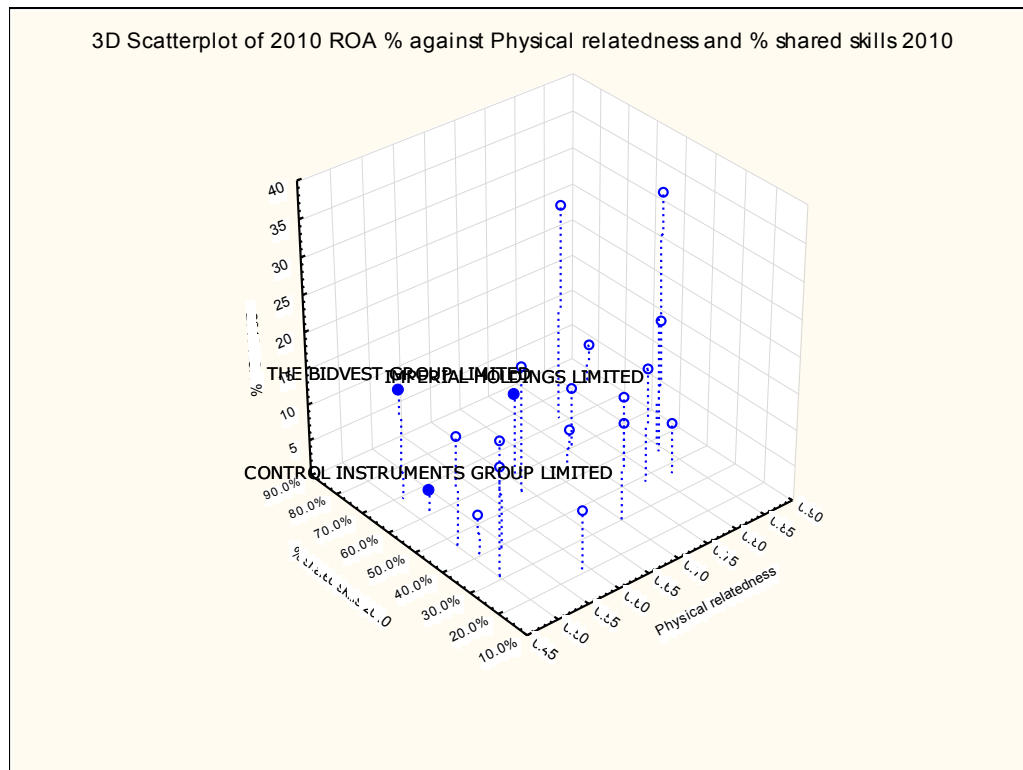


Figure 10: Scatter plot of 2010 ROA% against joint skill and physical relatedness

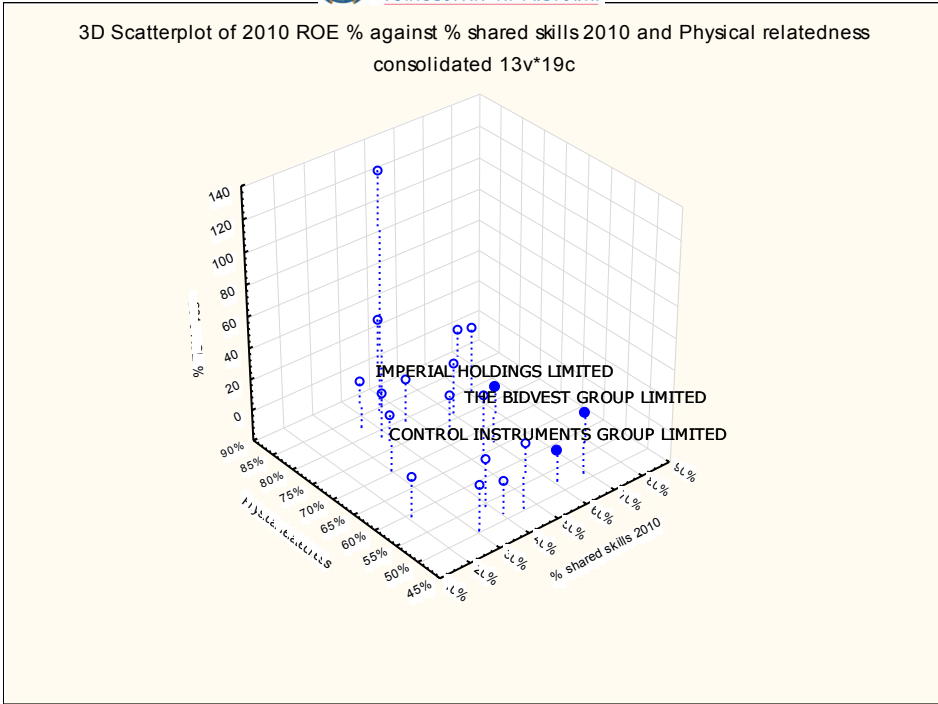


Figure 11: Scatter plot of 2010 ROE% against joint skill and physical relatedness

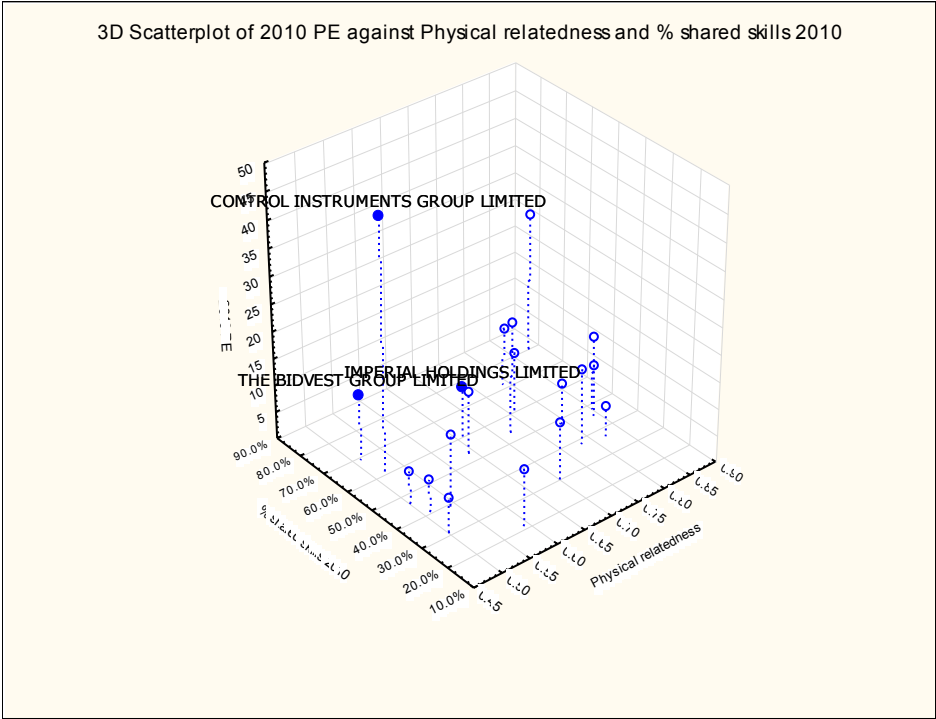


Figure 12: Scatter plot of 2010 P/E against joint skill and physical relatedness

Hypothesis 3 Conclusion

The sample size of companies considered in this study ($n=19$) was too small to permit the valid computation of the multiple correlations between the variables, based on multiple independent variables, i.e., between both skills and physical relatedness as predictors of company performance measures.

Thus the researcher used the univariate level bivariate correlations, as well as 3-dimensional scatter diagrams to judge whether there was no evidence of a pattern of companies with high values on both skills and physical relatedness to be performing better than companies with low values on both skills and physical relatedness. No such pattern was evident based on the bivariate correlations and the 3-dimensional scatter diagrams.

Thus the Null hypotheses (H_{03a} , H_{03b} , and H_{03c}) cannot be rejected for Hypothesis 3.

6. DISCUSSION OF RESULTS

This chapter interprets the research findings in chapter five in conjunction with the literature review in chapter two and is divided into three sections. The first section **(6.1)** shows the results of the independent classification of the organisations as diversified organisations using a combination of the SIC classification and the Specialisation Ratio methods. The second section **(6.2)** discusses the results of relatedness for both skill and physical bases with the performance measures per hypothesis.

6.1 COMPANY CATEGORISATION

The SR categorization and SIC code classification for the year 2000 and 2010 are presented in **Table 7** for the diversified organisations. **Table 7** presents a high level breakdown of the organisations, the three-digit SIC code as well as the % revenue contribution per SIC (SR). **Appendix 2** details the complete analysis of each of the organisations that are not part of the diversified category.

The classification of organisations represents two approaches used to ensure meticulous classification. The SIC and SR approach are found to be best as concluded by Montgomery (1982) that both approaches have strengths and weaknesses and that both approaches were also conducted by other researchers such as Rumelt (1982).

6.2 PERFORMANCE MEASURES

The objective of the study was to measure the effects of physical and skill base of relatedness both independently and jointly to ascertain if the relationship had an effect on organisational financial performance.

The research report does not find that there is any significant correlation or relationship between independent and joint relatedness and organizational performance in all three hypotheses. The one indication of statistical significance was found between the percentage of shared skills of companies and their P/E's, this was however not sufficient to disprove the Null hypothesis which required supporting evidence from all three performance measures and not just one.

The findings refine our understanding of relatedness as a multidimensional concept (Farjoun, 1998). They suggest that to have a more comprehensive evaluation of corporate diversification and its value in boosting company performance, one should consider a matrix of interrelationships across lines of business, activities, resources, industry effects and many more variables.

In their critique of research on corporate diversification, findings by Ramanujam and Varadarajan (1989) are inconclusive as to whether conglomerate diversification results in anticompetitive effects and whether it does lead to risk reduction for investors.

Similarly to Farjoun's study (Farjoun, 1998), who found that each base of relatedness alone had no significant effect on financial performance, this study revealed the same findings. However, when the two approaches were combined,

there was no strong positive effect on indicators of performance contrary to expectation and to Farjoun's findings on the joint effect of skill and physical relatedness having an influence on firm performance.

6.2.1 HYPOTHESIS 1:

The physical relatedness results for all three performance measures are presented in **Table 14** and **Table 15**. The Null hypotheses (Ho1a, Ho1b, and Ho1c) cannot be rejected for Hypothesis 1 as no significant relations were found between physical relatedness and the three measures of company performance ($p > 0.05$). Thus there is no indication of a significant relation between physical relatedness as defined in this study and the performance measures considered i.e. ROA, ROE and PE.

By using a single base of relatedness, the choice of a particular base can affect the way organisations are categorized into related and unrelated diversification categories. Ramanujam & Varadarajan (1989) support this observation that empirical results may be sensitive to varying categorisation schemes.

The finding of no significant effects for the physical base of relatedness provides additional support for previous diversification studies that did not find performance disparities between related and unrelated diversified organisations (Amit & Livnat, 1988).

6.2.2 HYPOTHESIS 2:

The skill relatedness results for all three performance measures are presented in **Table 16** and **Table 17**. The Null hypotheses (Ho2a, Ho2b, and Ho2c) cannot be rejected for Hypothesis 2 as no significant relations were found between skill relatedness and the three measures of company performance ($p > 0.05$).

The finding of significant relation between skill relatedness and organisation performance goes against some of the arguments in literature such as Wernerfelt (1984) who proposed that firms may earn above normal returns by identifying and acquiring resources that are critical to the development of demanded products in his first attempt at the Resource Based View (RBV).

The findings also fail to support Newbert (2007) who suggested that temporal research done under the auspices of resource heterogeneity approach shows that the trend toward examining capabilities and core competencies as opposed to resources is on the rise. This hints at the possibility of a response to advances in the theoretical literature and findings from empirical literature regarding the importance of capabilities and competencies relative to physical resources in determining a firm's competitive position (Newbert, 2007).

6.2.3 HYPOTHESIS 3:

The study findings associated with the joint effects of the two bases of relatedness on organizational performance were contrary to expectation. There was no any evidence of a pattern of companies with high values on both skills and physical relatedness to be performing better than companies with low values on both skills and physical relatedness.

The lack of association with performance of the interaction of the two bases of relatedness strongly disagrees with arguments for the complementary benefits of the two bases by Penrose (1959).

The lack of support for an interaction effect is inconsistent with Farjoun's argument that the combination of the physical and skill bases affects performance in two ways: that it extends the range of potential benefits provided by each base alone and reinforces those benefits when the two bases agree. Related diversification that builds on both physical and skill relatedness should allow organisation to benefit from sharing and transferring skill and physical resources and to take advantage of activities and routines in which these resources interact (Farjoun M. , 1998).

7. CONCLUSION

7.1 BACKGROUND

Diversification is an important strategic alternative commonly used by organisations in pursuit of different markets and greater returns. The findings of research on the diversification-performance relationship have been inconsistent with some views strongly advocating that the choice of a particular base influences the way organisations are categorized into related and unrelated diversification categories.

By examining the independent and joint effects of skill and physical bases of relatedness; this research study was conducted to test a multidimensional view of relatedness in diversification against financial performance.

7.2 FINDINGS

This research was conducted on organisations that are listed on the Industrial Sector of the JSE from 2000 to 2010. The research followed a multi-step approach; first the organisations had to be categorized as diversified, then the level of relatedness had to be determined for both skills and physical bases for each of the diversified organisations, thirdly, the financial performance was measured to determine if there was any relationship between levels of relatedness and financial performance.

The research report does not find that there is any significant correlation or relationship between independent and joint relatedness and organizational performance for all three hypotheses. The one indication of statistical significance was found between the percentage of shared skills of companies and their P/E's, this was however not sufficient to disprove the Null hypothesis which required supporting evidence from all three performance measures and not just one.

The findings improve our understanding of the diversification-performance relationship as a multifaceted concept. It suggests that to have a more comprehensive evaluation of corporate diversification and its linkage to performance, a matrix of variables should be considered.

In South Africa, there have been few studies on the diversification-performance relationship. The apartheid era pre-1994 resulted in the country being economically isolated from world markets, resulting in the formation of large conglomerates. With the integration of South Africa in the global economy post-1994, many of the conglomerates spun-off their non-core assets with evidence showing better performance following the spin-offs (Bhana, 2004). A few organisations that remained diversified performed well examples including The Bidvest Limited Group and Imperial Holdings.

Considering that skills shortage and educational gaps are prevalent in South Africa, a key incentive for the leadership of many of the South African organisations would have been to partially alleviate this challenge through the sharing of capabilities

and competencies across various business units within diversified organisations; from the findings of the study, this will however not necessarily lead to competitive advantage over competitors who are less relatedness from a skills point of view.

7.3 IN SUMMARY

It is therefore found in this research study that the three hypotheses cannot be statistically proven for the independent and joint effects of skill and physical bases of relatedness on financial performance.

7.4 RECOMMENDATIONS TO STAKEHOLDERS

Suggestion for managers is to carefully evaluate the range of industries to consider for diversification and also the range of potential alliances, competitors and partners.

It is important to consider the effects of different bases, those that could be more complementary, and the utilization of other important bases of relatedness such as customer segmentation, information and technology and research and development.

7.5 RECOMMENDATIONS FOR FUTURE RESEARCH

The research attempted to use an international research methodology in the South African context. Several limitations of the research were highlighted in Chapter 4.

Areas for future research are suggested below:

- The first recommendation is to expand the study to other or all Sectors of the JSE in South Africa to get a more diverse sample beyond just the Industrial Sector.
- The limitation of the approach to relatedness is that it captures relatedness as viewed by external observers and not internal stakeholders who might have more insight.
- The occupational measures (skills as defined by StatsSA) were limited as they did not capture other elements of skills such as continuous learning and innovation.
- The skill data used was re-based for relativeness to company level. Skill relatedness could benefit from firm specific data on skills pertaining to each organisation.
- As this research only focused on diversified organisations, more insight can be gained by increasing the number of diversification categories to be used as modeled by Rumelt (1982).

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APPENDIX

Appendix 1: JSE Industrial Sector

Companies listed under the Industrial Sector of JSE in 2011

ADCORP HOLDINGS LIMITED

AFRIMAT LIMITED

AG INDUSTRIES LIMITED

ALLIED ELECTRONICS CORPORATION LTD

AMALGAMATED ELECTRONIC CORPORATION LIMITED

ARB HOLDINGS LIMITED

ARGENT INDUSTRIAL LIMITED

ASTRAPAK LIMITED

AUSTRO GROUP LTD

AVENG LTD

BARLOWORLD LIMITED

BASIL READ HOLDINGS LIMITED

BELL EQUIPMENT LIMITED

BOWLER METCALF LIMITED

BUILDMAX LIMITED

CAFCA LTD

CARGO CARRIERS LIMITED

CERAMIC INDUSTRIES LIMITED

COMMAND HOLDINGS LIMITED

CONSOLIDATED INFRASTRUCTURE GROUP

CONTROL INSTRUMENTS GROUP LIMITED

DIGICORE HOLDINGS LIMITED

DISTRIBUTION AND WAREHOUSING NETWORK LTD

ELB GROUP LIMITED

ELLIES

EQSTRA HOLDINGS LIMITED

ESORFRANKI LTD

EXCELLERATE HOLDINGS LIMITED

GRINDROD LIMITED

GROUP FIVE LIMITED



Companies listed under the Industrial Sector of JSE in 2011

HOWDEN AFRICA HOLDINGS LIMITED
HUDACO INDUSTRIES LIMITED
ILIAD AFRICA LIMITED
IMPERIAL HOLDINGS LIMITED
INVICTA HOLDINGS LIMITED
JASCO ELECTRONICS HOLDINGS LIMITED
KAIROS INDUSTRIAL HOLDINGS LIMITED
KAP INTERNATIONAL HOLDINGS LIMITED
KAYDAY GROUP LIMITED
KELLY GROUP
MARSHALL MONTEAGLE HOLDINGS SOCIETE ANONYME
MASONITE (AFRICA) LIMITED
MAZOR GROUP LTD
METROFILE HOLDINGS LIMITED
MICROMEGA HOLDINGS LIMITED
MIX TELEMATICS LTD
MOBILE INDUSTRIES LIMITED
MORVEST BUS GROUP LTD
MPACT
MURRAY AND ROBERTS HOLDINGS LIMITED
MVELA SERVE
NAMPAK LIMITED
NET 1 UEPS TECHNOLOGIES INC
PRETORIA PORTLAND CEMENT COMPANY LD
PRIMESERV GROUP LIMITED
PROTECH KHUTHELE HOLDINGS LTD
RAUBEX GROUP LIMITED
REMGRO LIMITED
REUNERT LIMITED
SANYATI HOLDINGS LIMITED
SEA KAY HOLDINGS LIMITED
SOUTH OCEAN HOLDINGS LIMITED
STEFANUTTI STOCKS HOLDINGS LTD

Companies listed under the Industrial Sector of JSE in 2011

SUPER GROUP LIMITED
THE BIDVEST GROUP LIMITED
TRANSPACO LIMITED
TRENCOR LIMITED
UNIVERSAL INDUSTRIES CORPORATION LTD
VALUE GROUP LIMITED
WILSON BAYLY HOLMES-OVCON LIMITED
WINHOLD LIMITED

Source: McGregor BFANet

Appendix 2: Organisations rejected from samples

Organisations rejected from the Sample with rejection reason	
Organisation	Rejection Reason
ADCORP HOLDINGS LIMITED	Focused (SR > 95%)
AG INDUSTRIES LIMITED	Focused (SR > 95%)
ASTRAPAK LIMITED	Focused (SR > 95%)
AVENG LTD	Focused (SR > 95%)
BASIL READ HOLDINGS LIMITED	Focused (SR > 95%)
CERAMIC INDUSTRIES LIMITED	Focused (SR > 95%)
ELB GROUP LIMITED	Focused (SR > 95%)
MURRAY AND ROBERTS HOLDINGS LIMITED	Focused (SR > 95%)
NAMPAK LIMITED	Focused (SR > 95%)
PRIMESERV GROUP LIMITED	Focused (SR > 95%)
TRANSPACO LIMITED	Focused (SR > 95%)
TRENCOR LIMITED	Focused (SR > 95%)
VALUE GROUP LIMITED	Focused (SR > 95%)
WILSON BAYLY HOLMES-OVCON LIMITED	Focused (SR > 95%)
WINHOLD LIMITED	Focused (SR > 95%)
AFRIMAT LIMITED	Listed after 2000
ESORFRANKI LTD	Listed after 2000
MARSHALL MONTEAGLE HOLDINGS SOCIETE ANONYME	Listed after 2000
MORVEST BUS GROUP LTD	Listed after 2000

Organisations rejected from the Sample with rejection reason	
RAUBEX GROUP LIMITED	Listed after 2000
SANYATI HOLDINGS LIMITED	Listed after 2000
ARB HOLDINGS LIMITED	Listed after 2000
AUSTRO GROUP LTD	Listed after 2000
CONSOLIDATED INFRASTRUCTURE GROUP	Listed after 2000
ELLIES	Listed after 2000
EQSTRA HOLDINGS LIMITED	Listed after 2000
KAYDAY GROUP LIMITED	Listed after 2000
KELLY GROUP	Listed after 2000
MAZOR GROUP LTD	Listed after 2000
MIX TELEMATICS LTD	Listed after 2000
MPACT	Listed after 2000
MVELA SERVE	Listed after 2000
NET 1 UEPS TECHNOLOGIES INC	Listed after 2000
PROTECH KHUTHELE HOLDINGS LTD	Listed after 2000
SEA KAY HOLDINGS LIMITED	Listed after 2000
SOUTH OCEAN HOLDINGS LIMITED	Listed after 2000
STEFANUTTI STOCKS HOLDINGS LTD	Listed after 2000
UNIVERSAL INDUSTRIES CORPORATION LTD	Listed after 2000
AMALGAMATED ELECTRONIC CORPORATION LIMITED	Listed after 2000
CAFCA LTD	Listed after 2000
BOWLER METCALF LIMITED	SIC code not available
ARGENT INDUSTRIAL LIMITED	No Segmental Reporting of Revenue
BELL EQUIPMENT LIMITED	No Segmental Reporting of Revenue
BUILDMAX LIMITED	No Segmental Reporting of Revenue
CARGO CARRIERS LIMITED	No Segmental Reporting of Revenue
COMMAND HOLDINGS LIMITED	No Segmental Reporting of Revenue
DISTRIBUTION AND WAREHOUSING NETWORK LTD	No Segmental Reporting of Revenue
KAIROS INDUSTRIAL HOLDINGS LIMITED	No Segmental Reporting of Revenue
KAP INTERNATIONAL HOLDINGS LIMITED	No Segmental Reporting of Revenue
MASONITE (AFRICA) LIMITED	No Segmental Reporting of Revenue
MOBILE INDUSTRIES LIMITED	No Segmental Reporting of Revenue

Source: McGregor BFANet

Appendix 3: Calculation of Skill Relatedness

Company	SIC	% revenue split	Total industry skills unweighted	Total industry skills weighted for company	Total industry skills weighted for company that are common or shared skills	% shared skills in company
ALLIED ELECTRONICS CORPORATION LTD	366	54.0%	247	133		
ALLIED ELECTRONICS CORPORATION LTD	752	25.0%	91127	22782		
ALLIED ELECTRONICS CORPORATION LTD	869	15.0%	11507	1726		
ALLIED ELECTRONICS CORPORATION LTD			102880	24641	9527	38.7%
BARLOWORLD LIMITED	342		90143	0		
BARLOWORLD LIMITED	351		110129	0		
BARLOWORLD LIMITED	355		66655	0		
BARLOWORLD LIMITED	356	88.0%	40837	35937		
BARLOWORLD LIMITED	504		111000	0		
BARLOWORLD LIMITED	615	7.6%	8922	678		
BARLOWORLD LIMITED	631	2.0%	73432	1469		
BARLOWORLD LIMITED	712	1.2%	459791	5517		
BARLOWORLD LIMITED			960908	34614	43601	79.4%
DIGICORE HOLDINGS LIMITED	741	78.0%	63132	49243		
DIGICORE HOLDINGS LIMITED	752	11.0%	91127	10024		
DIGICORE HOLDINGS LIMITED	865	11.0%	16136	1775		
DIGICORE HOLDINGS LIMITED			170395	23015	61042	37.7%
EXCELLERATE HOLDINGS LIMITED	612	50.0%	39741	19870		
EXCELLERATE HOLDINGS LIMITED	642	47.0%	316794	148893		
EXCELLERATE HOLDINGS LIMITED			356535	51316	168764	30.4%
HOWDEN AFRICA HOLDINGS LIMITED	356	84.0%	40837	34303		



Company	SIC	% revenue split	Total industry skills unweighted	Total industry skills weighted for company	Total industry skills weighted for company that are common or shared skills	% shared skills in company
HOWDEN AFRICA HOLDINGS LIMITED	357	15.0%	40843	6126		
HOWDEN AFRICA HOLDINGS LIMITED			81680	18247	40430	45.1%
HUDACO INDUSTRIES LIMITED	357	29.0%	40843	11844		
HUDACO INDUSTRIES LIMITED	374	70.0%	9118	6383		
HUDACO INDUSTRIES LIMITED			49961	5413	18227	29.7%
ILIAD AFRICA LIMITED	342	27.0%	90143	24338		
ILIAD AFRICA LIMITED	614	72.0%	56820	40910		
ILIAD AFRICA LIMITED			146962	34627	65249	53.1%
IMPERIAL HOLDINGS LIMITED	631	28.0%	73432	20561		
IMPERIAL HOLDINGS LIMITED	741	66.0%	63132	41667		
IMPERIAL HOLDINGS LIMITED	821	5.0%	113166	5658		
IMPERIAL HOLDINGS LIMITED			249730	40599	67886	59.8%
JASCO ELECTRONICS HOLDINGS LIMITED	752	20.0%	91127	18225		
JASCO ELECTRONICS HOLDINGS LIMITED	869	79.0%	11507	9090		
JASCO ELECTRONICS HOLDINGS LIMITED			102633	12977	27316	47.5%
INVICTA HOLDINGS LIMITED	356	50.0%	40837	20419		
INVICTA HOLDINGS LIMITED	357	44.0%	40843	17971		
INVICTA HOLDINGS LIMITED			81680	17648	38389	46.0%
MICROMEGA HOLDINGS LIMITED	819	51.0%	51513	26272		
MICROMEGA HOLDINGS LIMITED	831	49.0%	8935	4378		
MICROMEGA HOLDINGS LIMITED			60449	12328	30650	40.2%
SUPER GROUP LIMITED	633	40.0%	52407	20963		
SUPER GROUP LIMITED	712	59.0%	459791	271277		



Company	SIC	% revenue split	Total industry skills unweighted	Total industry skills weighted for company	Total industry skills weighted for company that are common or shared skills	% shared skills in company
SUPER GROUP LIMITED			512198	60858	292239	20.8%
THE BIDVEST GROUP LIMITED	323		63995	0		
THE BIDVEST GROUP LIMITED	325	1.8%	54366	979		
THE BIDVEST GROUP LIMITED	642	51.0%	316794	161565		
THE BIDVEST GROUP LIMITED	721	1.4%	3274	46		
THE BIDVEST GROUP LIMITED	741		63132	0		
THE BIDVEST GROUP LIMITED	819	17.0%	51513	8757		
THE BIDVEST GROUP LIMITED	889	15.0%	757082	113562		
THE BIDVEST GROUP LIMITED			1310157	195425	284909	68.6%
CONTROL INSTRUMENTS GROUP LIMITED	862	48.0%	32989	15835		
CONTROL INSTRUMENTS GROUP LIMITED	869	52.0%	11507	5984		
CONTROL INSTRUMENTS GROUP LIMITED			44496	13252	21818	60.7%
GRINDROD LIMITED	712	8.7%	459791	40002		
GRINDROD LIMITED	721	14.0%	3274	458		
GRINDROD LIMITED	741	76.6%	63132	48359		
GRINDROD LIMITED			526197	53479	88819	60.2%
GROUP FIVE LIMITED	501	5.2%	1239	64		
GROUP FIVE LIMITED	502	82.0%	742173	608582		
GROUP FIVE LIMITED	503	12.0%	201262	24151		
GROUP FIVE LIMITED			944674	229342	632798	36.2%
METROFILE HOLDINGS LIMITED	862	79.0%	32989	26061		
METROFILE HOLDINGS LIMITED	865	17.0%	16136	2743		
METROFILE HOLDINGS LIMITED	869	4.0%	11507	460		
METROFILE HOLDINGS LIMITED			60632	20807	29265	71.1%



Company	SIC	% revenue split	Total industry skills unweighted	Total industry skills weighted for company	Total industry skills weighted for company that are common or shared skills	% shared skills in company
PRETORIA PORTLAND CEMENT COMPANY LD	251	10.0%	10861	1086		
PRETORIA PORTLAND CEMENT COMPANY LD	335	4.3%	64375	2768		
PRETORIA PORTLAND CEMENT COMPANY LD	342	85.0%	90143	76621		
PRETORIA PORTLAND CEMENT COMPANY LD			165379	38213	80475	47.5%
REUNERT LIMITED	615	91.0%	8922	8119		
REUNERT LIMITED	752	7.4%	91127	6743		
REUNERT LIMITED			100049	7866	14863	52.9%