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AN ASSESSMENT OF THE ROLE OF OCCUPATIONAL HEALTH AND SAFETY AND ITS IMPACT ON BUSINESS PERFORMANCE WITHIN THE RIO TINTO GROUP

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Abstract

Rio Tinto, the world's second largest mining organisation has had its fair share of fatalities and workplace injuries and illnesses. The mining giant managed to reduce its injuries and illnesses due to investments in good occupational health and safety systems, processes and practices with the aim that strategic investments in occupational health and safety also bring about financial opportunities. The study was thus aimed at assessing the role of occupational health and safety and its impacts on business performance within the Rio Tinto Group of companies. This research relied on a two-track approach: firstly, using systematic sampling, a form of random probability sampling to collect primary data from 10 senior executives deemed as subject matter experts on the topic of health and safety performance and profitability. This was strengthened with data analysis performed using a desk study approach. A survey instrument in the form of a questionnaire was used and the results from this approach strengthened the findings with a statistical analysis desk study. Descriptive statistics methods were used for data analysis, presentation and discussions of the results.

Keywords: Assessment, Occupational Health, Safety, Business, Performance, Mining, Organization, Fatalities, Illnesses

Introduction

Headquartered in the United Kingdom are the world's second largest and leading mining company; Rio Tinto, whose focus is on finding, mining and processing the earth's mineral resources. The company operates open cast and underground mines, mills, refineries, smelters and power stations including hydropower plants. In addition to this, it also owns and operates supply chain infrastructures such as roads, railways, ports and ships taking its products to its customers. It has got a large portfolio with major products including aluminium, copper, diamonds, gold, industrial minerals, iron ore, coal and uranium. These minerals are aimed at improving the standard of living and ultimately fostering economic growth and development as improvements come about with the supply of its products to the construction, communications, recreation, transportation, healthcare and the renewable energy industries (Rio Tinto, 2016: 1). This 140 year old mining giant has a workforce of about 55,000 crossing borders of more than 40 countries in all the continents of this Earth. With such a large workforce, the firm has placed their safety as its first concern while it fosters a culture of innovation, efficiency and productivity (Rio Tinto, 2016: 2).

At Rio Tinto, occupational health and safety take first priority and goes hand in hand with productivity. These two aspects are ultimately seen as key drivers of business performance and consequently the main determinants of great business performance. The company always had it as a firm held believe that if one can manage safety, productivity follows ultimately leading to improved overall business performance. In addition to this, senior leadership within the Rio Tinto Group are of the opinion that profitability as measured in the income statement goes hand in hand with good safety performance and thus, the talk in all meetings and formal set ups starts with safety, production and cost. There is thus a need to assess and determine whether good safety performance makes good business sense in terms of the bottom line.

Aim of the Study

The study was aimed at assessing the role of occupational health and safety and its impacts on business performance within the Rio Tinto Group of companies.

Objectives of the Study

- To determine the role of occupational health and safety on business performance within all the product groups of the Rio Tinto group of companies.
- To determine if improvements made in occupational health and safety has led to improved business performance
- To establish if occupational health and safety is a key driver of profitability within the Rio Tinto group of companies.
- To make recommendations for improvement at strategic level on health and safety in the business planning model.

Rio Tinto has made considerable investments and improved its health and safety systems, practices and processes over the last 10 – 15 years. Today, health and safety performance are seen as key strategic aspects of business performance in that they contribute to enhanced employee morale, reduces liability costs and creates shareholder confidence, improving overall business reputation. They are also seen as drivers of enhanced business performance. However, has these improvements led to any changes to the business in terms of profitability? In addition to this, are such investments necessary and do they drive performance in any way? All these questions will be explored in the next chapter in which literature will be reviewed to establish the theoretical framework of the research as well as test whether occupational health and safety does go hand in hand with business performance in particular, the element of profitability.

Literature Review

Definitions

Health and Safety at Work: According to both the International Labour Organisation (ILO) and the World Health Organisation (WHO), health and safety in the workplace refers to the promotion and maintenance of the highest degree of physical, mental and social wellbeing for all workers in all occupations as well as the prevention and protection of all work related illnesses and injuries. This aspect is also concerned with the placement and maintenance of workers in an occupational environment adapted to their physical and psychological capabilities to promote the wellbeing of all workers. Thus, health and safety in the workplace is more concerned with the adaptation of workers to their jobs and jobs to the workers (Hesapro, 2012: 5).

Productivity: Haizer and Render (2014: 49) describes productivity as the ratio of outputs such as goods and services divided by inputs (namely, resources such as labour and capital) and that the key function of an operations manager is to exert pressure and keep focus on improving this ratio. This is rather important as overall; this can mean the uplifting of the living standards and ultimately lead to economic growth of the country as more revenue is being generated with minimal waste. There is however a distinct difference between production and productivity such that the latter refers to producing goods or services more efficiently while high production refers more to producing more units (Haizer and Render, 2014: 62).

Factors of Productivity: Magdum (2012: 12) cited in his journal that productivity signifies the measurement of how well an organisation uses its resources to produce outputs from inputs and these can vary in numbers by being either

single factored (that is; indicating the ratio of a single input resource to the output produced) or multi factored which takes inputs from many more resources for the goods or services produced. The main variables in productivity are mainly labour, capital and management contributing 10%, 38% and 52% respectively to improved productivity (Haizer & Render, 2014: 51).

According to Magdum (2012: 13) various factors affecting productivity in industry varies from the size of the organisation thus, management's role is to understand the key factors and their impacts on productivity in order to put mitigatory strategies in place that will lead to improving overall organisational effectiveness. The key factors can be grouped in five main categories, namely Methods (namely, poor execution plans, lack of planning, tools and equipment), Capital (namely, lack of material, procurement delays and lack of capital), Quality (namely, poor quality of labour and material), Technology (namely, lack of technologically advanced equipment) and Management (namely, labour strikes, high employee absenteeism, lack of supervision, poor management, lack of skills, improper training, poor instructions, labour shortages, accidents, alcohol and drug use) (Magdum, 2012: 13). Magdum (2012: 14) continues to cite that ineffective management is the primary cause of low productivity rather than any of the other factors and this is evident from the above-mentioned list of factors where management has the most challenges listed under it. However, there are various other barriers that also affect productivity such as lack of alignment, challenges in measuring productivity, lack of continuous improvement as well as lack of employee focus.

According to Magdum (2012: 14) by just focusing on the five key drivers; a number of ways can be used to improve productivity within a business. These include developing productivity measures that will drive the employee focus, identifying the systems weaknesses and working on improving those, employee training, employee engagement and involvement in solutions to the business challenges, well refined logistics and procurement supply chain, capital planning and supervision (including work discipline). Workers also thrive from well-defined systems, well maintained facilities driving health and safety in the workplace. Clear programmes of work and having a systematic flow of work can also lead to improvements in productivity. The same applies to having well documented execution plans. Finally, it is also worth noting that productivity gains also come from using technological advancement and maximising on the use of machinery and automation in the 21st century cannot go unnoticed (Magdum, 2012: 14).

Profitability: "Profitability is the primary goal of all business ventures. Without profitability, the business will not survive in the long run. This implies measuring current and past profitability and projecting future profitability is very important" (Hofstrand, 2009: 1). Profitability measures are the best known and most widely used of all financial ratios. They intend to measure how efficiently a firm uses its assets and how efficiently a firm manages its operations (Fifer, Westerfield, Ross and Jordan, 2012: 56). There are various measures of profitability of which most are generally expressed as a percentage.

Framework for Occupational Health and Safety, Company Goals and Performance: It is believed that occupational health and safety programmes generate effects and outcomes that positively influences company performance and which contribute positively to the goals of an organisation. However, in order to have an effective influence on organisational performance, the occupational health and safety programme must be aligned with the firm's goals and objectives (Hesapro, 2012: 11 – 12).

Principles of Occupational Health and Safety: Occupational health and safety is "generally defined as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment" (Alli, 2008: 7). This field is of a multidisciplinary nature dealing with diverse issues related to medicine, ergonomics, physics, chemistry, technology, economics and pertaining to the industry and its related activities. However, as vast as it is, it is founded on the basic principles of human rights protection, mandating the establishment of preventative and protective health and safety programmes, policies and systems at national level as well as the promotion of stakeholder consultation and the cycle of continuous improvement (Alli, 2008: 17). Other principles include the setting out of responsibilities and accountabilities of employers and stakeholders, provision of compensation and rehabilitation services to injured workers, education and training as well as enforcing of policies. All these principles and the provisions of international labour standards are designed to achieve one vital objective: "that work should take place in a safe and healthy environment" (Alli, 2008: 18 – 19).

Health and Safety Practices within Rio Tinto: Health, safety and environmental issues present significant risks to Rio Tinto, both to individual businesses and to the Group as a whole (Rio Tinto, 2012: 1). The Rio Tinto approach to health and safety management is of an integrated nature where integrated series of processes, procedures, plans and tools have been put together for use to manage the mining group's day-to-day Health, Safety, Environment and Quality (HSEQ) responsibilities, identify and manage its risks & obligations and support improving its overall performance. The group has developed a central global Health, Safety and Environment programme, whereby all group product groups are required to meet the same standard of practice in order to manage risk and improve Health, Safety and Environment (HSE) performance. The programme supports individual product groups to achieve their performance objectives as well as the group as a whole (Rio Tinto, 2012: 2).

The standard is designed on the principles of continual improvement and adopts the methodology of Plan, Do, Check and Review as is standard with the requirements of the mining industry and fundamental occupational health and safety principles (Rio Tinto, 2012: 3). The standard aligns with relevant international standards organisation's (ISO) standards particularly related to; International Standards Organisation (ISO) 14001, Occupational Health and Safety Standard (OSHAS) 18001, Australia /New Zealand Standard (AS/NZS) 4801 and International Standards Organisation (ISO) 9001 meaning that if a business unit conforms to the standard, it will comply with all the certification requirements of these international standards. The standard is divided into seventeen elements. Each element sets out to achieve a specific objective to address the risks associated with that element and each element includes a number of clauses, which spell out the minimum requirements to meet each objective starting with policy commitment, legal and other requirements, hazard identification and risk management, improvement planning, training, awareness and competency, document control, supplier and contractor management, operational control, emergency response, incident and action management, performance management and auditing and the management review (Rio Tinto, 2012: 4 – 8).

Measuring Occupational Health and Safety performance: Alli (2008: 55) emphasises the necessity entailed in measuring occupational health and safety performance over time. He states that “in order to check that there is a continuous improvement in eliminating occupational injuries and illness. Employers should regularly verify the implementation of applicable occupational health and safety standards, for instance by environmental monitoring, and should undertake systematic safety audits from time to time. Furthermore, they should keep records relating to occupational safety and health and the working environment, as specified by the competent authority. Such information might include records of all notifiable accidents and injuries to health which arise in the course of or in connection with work, lists of authorizations and exemptions under laws or regulations relating to the supervision of the health of workers in the enterprise, and data concerning exposure to specified substances and agents” (Alli, 2008: 55).

Measuring Health and Safety Performance within Rio Tinto: Managing occupational health and safety risks associated with the business units' work activities entails implementing all 17 elements of the standard as well as other mandated or necessary risk treatment processes aimed at controlling the risk to As Low as Reasonably Practicable (ALARP) industry standards. In this instance, Element 10 dealing with operational control and Element 13 which deals with measuring and monitoring are particularly important as that is where the performance standard implementation as well as measurement and monitoring comes into play. The key items in this regard are that the Rio Tinto HSE performance standards should be implemented. Procedures or work instructions that detail the controls required to treat the HSE [Q] risks associated with work activities should be developed. Further to this, there is a requirement that operational procedures be developed to include hazard assessments, design specifications, operating criteria and maintenance or inspection strategies. Both the plant and equipment must be maintained, inspected and tested to ensure it meets design specifications and operating criteria and all equipment or services provided by third parties must have the relevant controls verified (Rio Tinto, 2012: 10).

There are several parameters used to measure occupational health and safety in this mining conglomerate including both leading and lagging indicators. Leading indicators refer to measurable factors that follow a particular trend or direction ahead of an actual event. These types of statistics precede an event and thus are good indicators in forecasting the forthcoming pattern of the overall performance (Business Dictionary, 2016). Within the Rio Tinto occupational health and safety context, leading indicators include the reporting of near misses, occupational health monitoring results, crew projects, and HSEQ suggestions, reporting of hazards, audit findings and inspection reports. Lagging indicators on the other hand tend to change after the event has occurred and generally trail behind (Business Dictionary, 2016). In terms of occupational health and safety, these indicators are the enumeration of the actual event (i.e. occupational illnesses,

incidents and vehicle incidents) and are expressed as a rate or number of incidents. The most frequently used measure of safety performance within Rio Tinto is the All Injury Frequency Rate (AIFR) described as the occurrence rate of all medical treatment cases (MTC) and lost day injuries (LDI) which are also known as reportable injuries. It is calculated as follows (Rio Tinto, 2012: 13):

$$\text{AIFR} = \frac{\text{Number of all injuries} \times 200\,000}{\text{Hours of exposure}}$$

This is the occupational health and safety measure that will be used in the research study to determine good or bad safety performance, meaning that although there are several other measures to measure occupational health and safety performance the study will only use this measure to determine good occupational health and safety performance.

Productivity and Business Performance

Productivity within an organisation contributes to either value creation or value addition by continuously making better use of resources to contribute to growth, innovation and employment and is not seen just as a statistical ratio. It is an expression of how efficiently and effectively goods and services are being produced. Thus, “its key characteristics are that it is expressed in physical or economic units, namely, in quantities or monetary values based on measurements which are made at the different levels. These levels can be that of the overall economy, that of a sector or branch of the economy, that of the organisation and its individual product groups and that of employees” (EANPC, 2005: 5). Moreover, productivity is not only measured by quantity and quality, but also by the benefit the customer obtains (Hesapro, 2013: 5).

According to Gahan et al. (2014: 13 – 17) research has shown that good occupational health and safety practices are widely considered as a driver of competitive advantage, enhanced status from the stakeholders’ viewpoint and increased profitability and as well as reputational gains. They continue to elaborate that the case for investing in better occupational health and safety outcomes may represent strategic value to the business, rather than simply an avenue for immediate economic value. Former BHP Billiton CEO, Mr. Chris Goodyear (2006) further emphasised this while speaking about the disadvantages a poor image occupational health and safety can create to a business. In his 2006 speech, he stated that; “...there is no doubt our profitability would be hampered and shareholder value destroyed... It’s a powerful competitive differentiator. It has the potential to establish us as the company of choice, giving us better access to markets, natural resources and the best and brightest employees” (Goodyear 2006 cited in Young and Thyil, 2009: 170).

There are several contributors to value creation in a business productivity model and health and safety at work is one key element in this value chain. Health and safety becomes even more important in that it deals with human capital which is a key pre-requisite to business development. Thus, the need to ensure healthy and safe working conditions as this will in turn facilitate productivity (Hesapro, 2013: 4).

Measuring Business Performance: Boundless (2015: 1) emphasises that managers’ work must go beyond simply setting objectives and that they must consistently monitor operations in order to ensure feasibility and provide guidance to get failing operations and processes back on track. “Tools for this kind of management include budgeting, determining effective management strategies, finding areas that need improvement, and determining potential areas for collaboration”. Measuring performance is also seen as a vital part of assessing the value of employee and management activities. “Performance measurement provides useful insights for conducting annual reviews of managers and employees and is also important for understanding how a company is performing compared with its competitors”. This process thus requires two types of measurements, both for the individual employee and organisation evaluations (Boundless, 2015: 1 – 2).

In addition to this, it is important to note that there are two main approaches when it comes to measuring productivity, namely, the single-factor productivity measurement which indicates the ratio of one resource input to the goods and services produced (i.e. outputs) and multi-factor productivity measurement indicating the ratio of all resource inputs to the goods and services produced. Although both measurements are important in showing the operations manager the performance of his / her area of responsibility, it is important to note that single-factored productivity measures are not always as comprehensive and can be misleading. Although it can become complicated, the best approach is to use the multi-factor productivity (Abdullah, 2015: 3). Haizer & Render supports this further by stating “that although the multi-

factor productivity approach provides better information about the trade-offs amongst factors, measurement problems still remain”.

Measuring Business Performance using Profitability: According to Boundless (2015: 3) there are a wide variety of perspectives on controlling performance, each appropriate depending on the objectives and industry of the organisation. They continue to note that organisations setting objectives must carefully consider expected margins and ensure that they do not incur losses. The advantage of measuring profitability margins is that they indicate the cents-per-dollar the organisation makes by investing in its operations. The Queensland Government (2015: 1) states that there are two types of profit margins that can be used to calculate business performance, namely, gross profit and net profit margin. Gross profit margin is a profitability ratio showing how well a firm is doing and is a key indicator of management effectiveness of a business. It is described as the percentage of sales dollars left after subtracting the production cost of goods sold from the total sales figure. It basically measures the percentage of sales dollars remaining after overhead expenses have been settled. This becomes the profit of the organisation and is formulated as follows:

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit}}{\text{Sales Revenue}} \times 100$$

The Net Profit Margin on the other hand is described by the Queensland Government (2015:1) as a measure showing how much money is left after deducting direct and overhead expenses from gross profit. This ratio is the percentage of sales dollars left after subtracting the cost of sales and all other expenses, except tax. Generally speaking, a higher net profit margin is desired as it shows lower expense ratios relative to sales (Fifer et al., 2012: 57)

$$\text{Net Profit Margin} = \frac{\text{Net Profit Before Tax}}{\text{Sales Revenue}} \times 100$$

According to Fifer et al. (2012: 57 – 59) several other profitability ratios exist, starting with Return on Assets which measures profit per dollar of assets invested in the organisation. This ratio is an indicator of operating performance and is defined as follows:

$$\text{Return On Assets} = \frac{\text{Net Profit After Tax}}{\text{Total Assets}} \times 100$$

The final profitability ratio of interest to this study is the Return on Equity (also known as *return on net worth*), is an accounting rate of return which measures how the shareholders have fared during the year. Benefiting shareholders is a key strategic goal of Rio Tinto and thus a very important aspect of this study. In accounting terms, this ratio is the true bottom line measure of business performance. Fifer et al. (2012: 58) computes it as follows:

$$\text{Return On Equity} = \frac{\text{Net Profit After Tax}}{\text{Total Equity}} \times 100$$

Return on Equity: According to Hagel, Brown and Davison (2010: 1) most Wall Street analysts, investors and business executives tend to focus on return on equity as their primary measure of company performance recognizing that this is the ration that seems to get the most attention from the investor community. Although there are other ratios as discussed above, Return on Equity (ROE) has proven to be more enduring as it focuses on return to the shareholders of the company and thus is able to give shareholders a quick and easy way to understand their returns. Komashie (2014: 1) further supports this notion by describing ROE as one of the most important financial ratios and profitability metrics within an organisation. He refers to it as the ultimate ratio or the ‘mother of all ratios’ that can be obtained from a company’s financial statement as it measures how profitable a company is for the owner of the investment, and also how profitably a company employs its equity.

Advantages of ROE: According to the Mirae Asset Knowledge Company (2014: 3) ROE offers a useful signal of financial success since it indicates whether a firm is growing profits without pouring new equity capital into its business. A steadily increasing ROE signifies that management is giving shareholders more value for their money. A minimum of between 12 – 15% ROE is generally the acceptable when evaluating investment candidates and an averaging ROE over a period of 5 to 10 years does give a better indication of the historical growth of a firm. Komashie (2014: 2) supports this by stating that ROEs more than 12 – 15% are considered desirable however, adds that the ratio strongly depends on many factors such as the industry in which the firm operates as well as the economic environment (namely, inflation and macroeconomic risks).

“The DuPont formula, also known as the strategic profit model, is a common way to break down ROE into three important components. Essentially, ROE will equal the net margin multiplied by asset turnover multiplied by financial leverage. Splitting return on equity into three parts makes it easier to understand changes in ROE over time. For example, if the net margin increases, every sale brings in more money, resulting in a higher overall ROE. Similarly, if the asset turnover increases the firm generates more sales for every unit of assets owned, again resulting in a higher overall ROE. Finally, increasing financial leverage means that the firm uses more debt financing relative to equity financing. Increased debt will make a positive contribution to a firm's ROE only if the matching Return on assets (ROA) of that debt exceeds the interest rate on the debt” (Mirae Asset Knowledge Company, 2014: 4 – 5).

Shortcomings of ROE: Hagel et al. (2010: 2) also notes that although ROE is the most commonly used, it can also obscure potential problems. If investors are not careful, it can divert attention from business fundamentals and lead to surprises in that often time, firms may be tempted to resort to financial strategies that are able to artificially maintain a healthy ROE while hiding deteriorating performance, but this can only last for a while.

Companies are often tempted to resort to strategies and incentives that are aimed at keeping investors happy especially now with the mounting competitive pressure coupled with the low interest rates seen in the last decade. Schemes such as growing debt leverage and stock buybacks funded through accumulated cash can help to maintain a company's ROE even though operational profitability is eroding and thus, create a false and picture of how the actual firm is doing on the operations front (Hagel et al., 2010: 2). The events of the current economic downturn bear evidence to this as the effects of excessive debt leverage became a significant issue for many firms, making it a big financial risk and putting firms in deeper trouble. The situation can also become addictive in this vicious cycle (Hagel et al., 2010: 2).

Return on Assets: Audit IT (2016: 1) describes Return on assets (ROA) as a financial ratio that shows the percentage of profit that a company earns in relation to its overall resources (namely, total assets). Return on assets is a key profitability ratio which measures the amount of profit made by a company per dollar of its assets. ROA shows a firm's ability to generate profits before leverage, rather than by using leverage. Unlike return on equity (ROE), the formula for ROA measurements include all assets of an organisation and thus, ROA as a measure of profitability is able to give an idea as to how efficiently management uses a firm's assets to generate profit (Audit IT, 2016: 1).

Boundless (2015: 5) notes that ROA can be broken down into two parts, namely; profit margin and asset turnover and is able to measure how much each dollar in asset generates in sales. As referred to above, the return on assets ratio (ROA) is found by dividing net income by the total assets of an organisation. In general, a higher ROA ratio means that each dollar in assets produces more for the company while a low return on assets (in comparison with the industry average) indicates inefficient use of a firm's assets (Audit IT, 2016: 2). The ROA ratio was developed by DuPont with the aim of showing how effectively assets are being utilised in the organisational context. It is also able to measure and indicate how much the company relies on its assets to generate profit (Boundless, 2015: 5).

Shortcomings of ROA: Boundless (2015: 7) draws attention to the fact that ROA does have some drawbacks in that it gives no indication as to how the assets were financed such that although a firm may have a high ROA, it could still be in financial strains as all its assets could have been financed through leveraging. In addition to this, the total assets of a firm are based on the carrying value of the assets and not necessarily the market value. Thus, if there is a large discrepancy between the carrying value and market value of the assets, the ratio could give misleading numbers. Finally, there is no metric to find a good or bad ROA as is the case with ROE and thus, ROA is entirely contextual to the firm, the industry and the economic environment in which it operates (Audit IT, 2016: 3).

Advantages of ROA: Hagel et al. (2010: 3) suggest that firms rather use Return on Assets (ROA) as a measure of profitability as it avoids the potential distortions created by financial strategies like the ones mentioned above. Hagel et al. (2010: 3) continues to elaborate that ROA is a better metric of financial performance as it explicitly takes into account the assets used to support business activities. This metric is able to determine whether the company is able to generate an adequate return on these assets rather than simply showing return on sales. Thus, using ROA as a key performance metric quickly focuses management attention on the assets required to operate the business. Doing this, the firm is able to foster capability leverage which supports a business through all phases of the economic cycle as opposed to the financial leverage used in ROE which helps to drive higher returns to shareholders and neglect the potential of capability leverage. Therefore, ROA may foster a better view of fundamentals of the business, including asset utilization (Hagel et al., 2010: 4). In order to fulfil the objectives of this study, ROA will be used as the preferred measure of profitability as it fosters a better view of fundamentals of the business and is easily obtainable and quantifiable (Hagel et al., 2010: 4).

Identifying Key Drivers of Profitability: According to Queensland Government (2015: 1) profit drivers are categorised as either being financial or non-financial. Financial profit drivers are those with monetary values attached to them and can include aspects such as price, fixed costs, variable costs, sales volume, cost of debt and inventory. This is further supported by The BizCoach (2016: 1) who notes that there are four drivers of profit including price, variable costs, fixed costs and sales volume of which price is the biggest driver in that increasing price directly results in additional dollars and improves the bottom line.

Non-financial profit drives on the other hand have no monetary values linked to them and are more non-tangible while directly or indirectly influencing profitability. Aspects such as productivity, market share, client satisfaction and quality of the product or service greatly influence organizational profitability. In addition to this, factors such as employee training and satisfaction (morale), business culture and values, product and process innovation and employee health and safety are also great contributors to profitability. The BizCoach (2016: 2) concludes by noting the most effective strategy for maximizing a firm's profit being to aggressively price products or services and opting to deal only with those customers who see value delivered to them and refrain from those who are price sensitive. The Queensland Government (2015: 2) notes that "profitability is ultimately the only measure of success for any organisation".

Occupational Health and Safety and Performance: An element of key importance is the quality of the workforce, its management and its working conditions and it has been generally recognized that improving quality of working life and rising productivity do tend to go hand in hand (Hesapro, 2013: 5). Hesapro (2013: 11 – 13) continue to elaborate that occupational health and safety programmes generate effects and outcomes that positively influence performance at organisational level thus, contributing to the achievement of company goals and objectives. However, in order to have influence, the two aspects of the business must be aligned. This implies that both aspects must form part of the business strategy following the cycle of continuous improvement that ultimately leads to innovation and excellence. Outcomes are noticeable at both organisational level and individual worker level since occupational health and safety measures lead to change by creating better working conditions, improving the social climate and the overall organisational process. Overall results at organisational level include less costs, improved reputation and company image, less staff turnover and higher productivity. At the individual level, employees have greater health and safety awareness and are able to lead healthier lifestyles and live longer. They are also more motivated and have greater commitment towards the organisation leading to job satisfaction. This was demonstrated in various cases studies investigated by the Hesapro research partners where they found that investing in occupational health and safety programmes led to positive results for the organisations and their employees further stressing the point out that health and safety is not only an ethical and legal obligation but also one with economic benefits for organisations (Hesapro, 2013: 13). For example, various case studies found a correlation between implementing health and safety initiatives and improved business productivity and overall economic performance. The results of the study by Sockoll, Kramer and Bödeker (2009: 52 – 55) show that a highly developed management system increases the safety performance in terms of injuries, illness and absenteeism, as well as the competitiveness and the economic-financial performance. They note that "it is clear that these benefits are linked with quantifiable financial outcomes that directly affect the bottom line". One basic fact mentioned in this study is that a reduction in absenteeism rates will lower personnel costs, meaning that occupational health and safety as well as economic efficiency goes hand in hand. This is further supported by evidence from 55 UK case studies done in 2008 by PriceWaterhouseCoopers which clearly show that occupational health and safety programmes result in financial benefits in two ways, particularly cost savings related to less sickness related absenteeism and additional revenue generated through higher productivity (Sockoll et al., 2009: 48 – 49).

The benOSH study done by De Greef, Van den Broek, Van Der Heyden, Kuhl and Schmitz-Felten, 2011: 53) assessed the costs of 56 prevention projects in companies of different sizes and sectors with outcomes showing positive results of investing in occupational health and safety programmes as the majority of the case studies clearly demonstrated that health and safety interventions lead to positive economic indicators. Kirsten (2010: 254 – 255) also showed significant linear trends of changed productivity associated with changes in health risks in his study on health promotion and productivity. The trends observed in this study is that productivity loss increased as health risks increased and productivity loss decreased as health risks decreased. He goes on to support his finding by referring to a survey done by Buck Consultants in 2009 which involved more than 10 million respondents from 45 different countries. This survey found the most important strategic objective for offering health and safety promotion programmes to be improving productivity and presenteeism and this was in most regions of the world, not just some. Thus, the biggest motivation for firms to push for occupational health and safety programmes is so that they can improve productivity and overall business performance (Kirsten, 2010: 251 – 255).

Research Methodology

Population

The population for this study was the 29 business executives of the Rio Tinto Group of companies representing four (4) main product groups, namely; Diamonds and Mineral, Copper and Coal, Iron Ore and Aluminium.

Sampling

Sampling had to be undertaken although the sample size was relatively small as during design phase of the study, it proved to be difficult getting opinions and inputs from the business leaders. The sampling frame for the study included all 29 business units' leads of the Rio Tinto Group. A sample of 10 respondents was selected from a population of 29 business executives in this study, using the systematic probability sampling technique with a sampling fraction of one in three (1/3). This method of sampling has the advantage in that it ensures even representation, is relatively easy to design and explain and can be used for smaller number of cases as is the case with this part of the research study (Bhattacharjee, 2012: 67). In addition to these, the method is deemed to work well in research dealing with geographically dispersed cases (Saunders et al., 2009: 227 – 228) as was the case with this study. Despite these advantages, it was important to ensure that the sampling list did not contain periodic patterns as this would lead to sampling bias (Bryman, 2012: 192). Thus, the inclusion criteria used in this instance focused on this sample of the population due to their level of seniority, years of experience at strategic level as well as their knowledge of the business performance aspect (Babbie, 2008: 227).

A) Explaining the purpose of the study as well as giving an undertaking on the confidentiality of participants' identity and responses. A few simple instructions to be followed while completing the survey were given in the letter.

Data Analysis

Data collected from both the primary and desk study was entered into the MS Excel computer programmes for analysis and presented in line graphs for discussion and presentation. Statistical inference using hypothesis-testing was used as part of the analysis, and a One Way Analysis of Variance (ANOVA) was used. A One Way ANOVA compares the mean of one or more groups based on one independent variable (or factor). The level of confidence for the analysis is 95% (namely; 5% significant level). Data from the primary study was analysed using SurveyMonkey tools. Data was then presented in bar graphs as it was turned into useful information after which it would be interpreted.

Limitations of the Research

This research study was limited to using profitability as the key measure of business performance and all injury frequency rates as a measure of occupational health and safety performance. It is recognised that there are measures of profitability and occupational health and safety performance, but this study just focused on the two measures stated above. Questionnaires were distributed during this study, however to only a limited number of randomly selected senior executives as there was a desk study aspect used to obtain the correlation. The greatest focus was on safety performance

as measured within the Rio Tinto group and no other industry practices and measures were considered during this study. Occupational health parameters were not fully explored during this study as such information is confidential and of a sensitive nature and thus, publishing these could potentially lead to misinterpretation.

A one way Analysis of Variance (ANOVA) with a 5% significant level was used for the analysis. All quantitative data used in the study emanated from the product group's income statements as well as Health and Safety Reports over a period of 5 years per business unit. The data collected was for a 5 year period ranging from 2011 to 2015. It should be noted that due to the portfolio changes as a result of divestments in the Rio Tinto group, it was always difficult to include certain business units in the product group analysis as there were data gaps. There are potentially various factors at play in the overall business performance arena, however these were not the focus of this research study and thus, the establishment of the correlation was only limited to the two parameters under study.

The respondents were informed about the aims of the study, and their consent to participate in the survey was obtained. Further to this, the respondent's right to confidentiality was also respected in that all legal and other requirements pertaining to data protection were adhered to during the entire research project. Anonymity was another fact that was also assured to the respondents during this study. Permission to conduct this study from the organisation under study was sought and granted as per attachment in Appendix B.

Results, Discussion and Interpretation of Findings

Presentation of the Results

Findings for this study were arranged in two parts. The first part presented findings from the primary study as analysed from the questionnaire responses. The second part presented findings from the desk study data analysis.

Results from Primary Study (Survey Questionnaire): Findings from the primary study were analysed using software within the SurveyMonkey tool and the outputs are presented below. The responses were been graphically represented according to the order established in the questionnaire for ease of information flow and to promote understanding.

Response Rate: Babbie (2008: 288) describes the percentage of individuals responding to a self-administered questionnaire as the response (return) rate and notes that this rate generally guides the representativeness of the sample. In this study, seventy percent (70%) of the respondents took part in the survey. According to Babbie (2008: 289) this is considered a very good response rate and the focus should be more on demonstrating a lack of response bias as opposed to a higher response rate. In this instance, this high response rate is indicative of lesser chance of non-response bias.

Demographic Information: Responses in the demographic part of the questionnaire were scrutinised in terms of their distribution and percentage responses, thus transforming the data into useful information across a range of categories starting with gender, age, management level as well as the product group for which the respondents belong to.

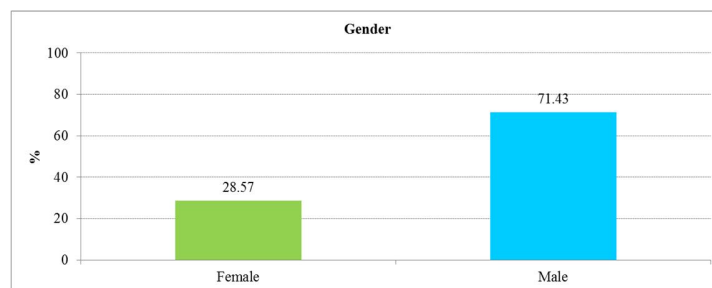


Figure 0.1: Gender

The graph in figure 0.1 shows the composition of the respondents as was summarised using descriptive statistics. 71% of the respondents were male while 29% were female.

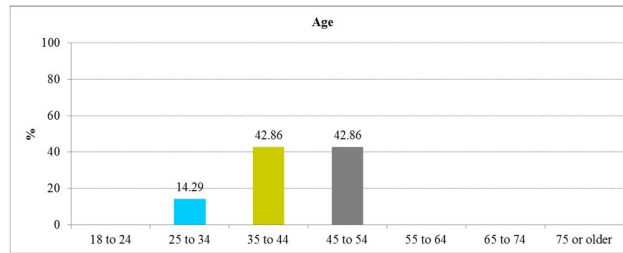


Figure 0.2: Age

The graph in figure 0.2 shows the composition of the respondents as was summarised using descriptive statistics. A collective 86% of the respondents are from the age group of 35 – 54 while 14% are within the 25 – 34 age groups. This demonstrates a mature and experienced group of respondents leading the business at executive level. This target team of experts were thus better suited to provide valuable information about occupational health and safety and business performance.

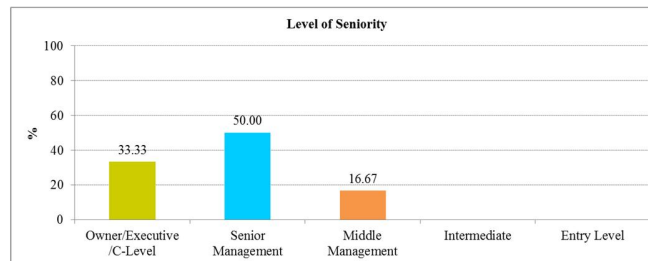


Figure 0.3: Level of Seniority within the Organisation

The graph in figure 0.3 shows the composition of the respondents as was summarised using descriptive statistics on the demographic aspect related to level of seniority within the organisation. 83% of the respondents were at executive level and served the organisation as business leads with a 17% at middle management level. It is important to note that the individuals at 17% had just been promoted prior to the survey and thus, completed the survey while still in their previous roles.

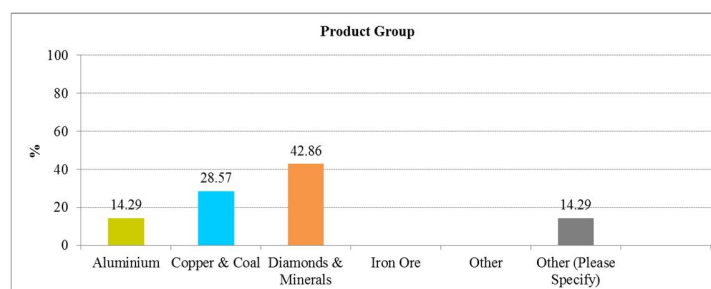


Figure 0.4: Product Group

The graph in figure 0.4 shows the composition of the respondents from a product group representation perspective. 14% of the respondents were serving the Aluminium and Iron Ore product groups while Copper & Coal stood at 29% representation. Diamonds and Minerals had the most respondents at 43%. It is important to note that the organisation has just undergone a leadership change at Chief Executive Level and thus changes also occurred at the business unit level. The respondents under “Other” represented the Iron Ore product group and were the newly promoted individuals referred to earlier in this report.

Determinants of Occupational Health and Safety: Responses in Part II of the questionnaire relating to the determinants of occupational health and safety within Rio Tinto were scrutinised in terms of their distribution and percentage responses, thus transforming the data into useful information across a range of categories. The results are presented in the graphs below.

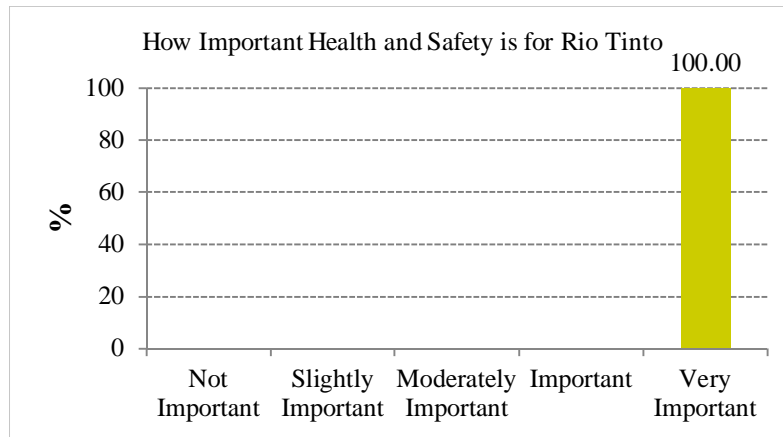


Figure 0.5: How Important Health and Safety is for Rio Tinto

The findings in figure 0.5 reveal that 100% of the respondents strongly agree that occupational health and safety is very important to Rio Tinto. None of the respondents disagreed or placed little importance to any of the aspects under study in this section of the questionnaire.

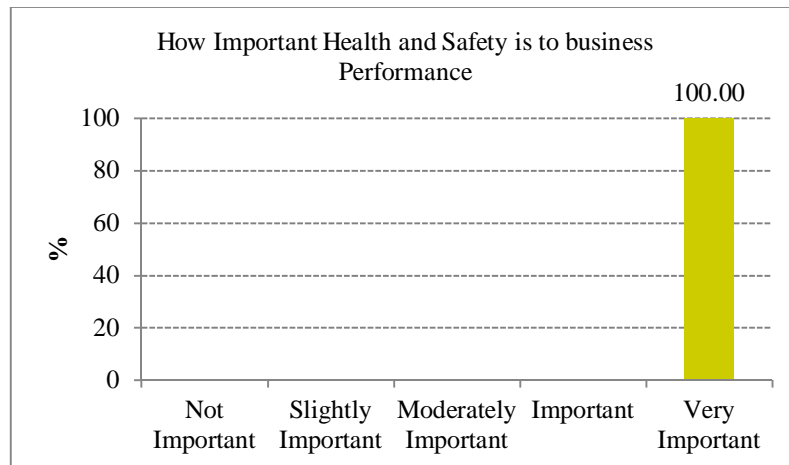


Figure 0.6: How Important Health and Safety is for Business Performance

Figure 0.6 shows that 100% of the respondents strongly agreed that occupational health and safety is a very important component of overall business performance. None of the respondents disagreed or placed little importance to any of the aspects under study in this section of the questionnaire.

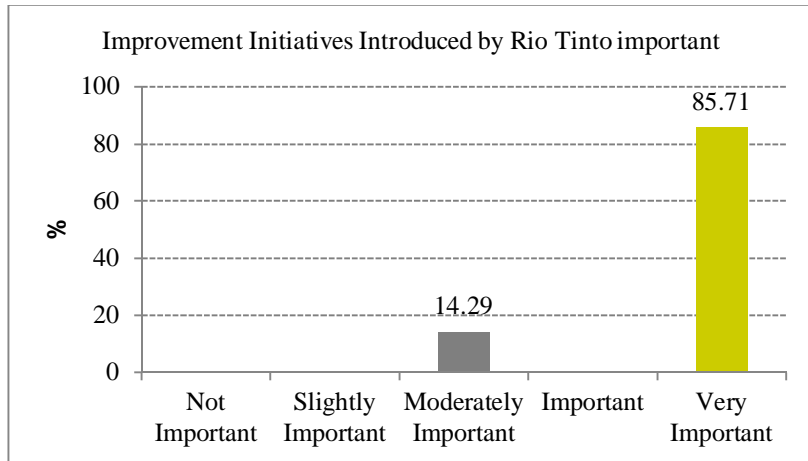


Figure 0.7: Improvement Initiatives Introduced by Rio Tinto Important?

From the graph in figure 0.7 it can be observed that 86% of respondents strongly agreed that improvements in occupational health and safety brought about improvements in overall business performance while 14% placed moderate importance to this concept. None of the respondents placed little importance to or categorised this aspect as being slightly important.

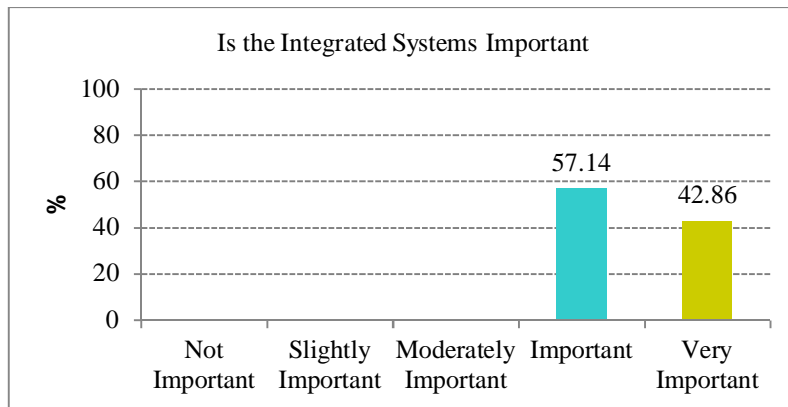


Figure 0.8: Is the Integrated HSEQ MS Systems and Associated Programmes Important

Figure 0.8 shows that 57% of the respondents noted that the integrated HSEQ MS was important to the improvement of the overall health and safety performance of Rio Tinto while 43% thought this was very important. None of the respondents placed little importance to or categorised this aspect as being slightly or moderately important.

Correlation between Health and Safety and Business Performance: Responses in Part III of the questionnaire relating to the correlation of occupational health and safety and business performance within Rio Tinto were scrutinised in terms of their distribution and percentage responses, thus transforming the data into useful information across a range of categories. The results are presented in the graphs below.

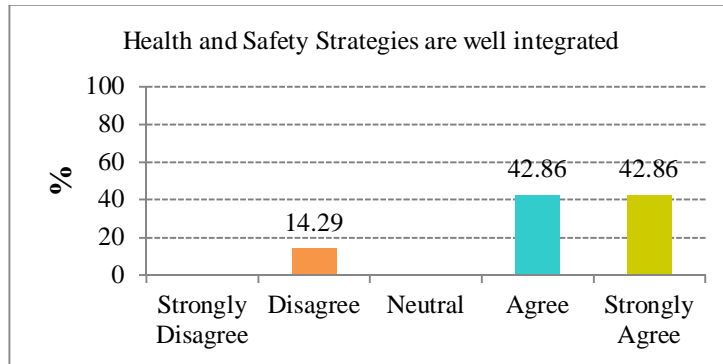


Figure 0.9: Health and Safety Strategies are well integrated

The findings in figure 0.9 reveal that a 42.5% of the respondents strongly agree and another 42.5% agree that our health and safety strategy is integrated into other aspects of the organisation thus, driving overall business performance. This implies a collective 83% of the respondents agreeing that occupational health and safety are well integrated into business performance while 14% disagreed with this concept. None of the respondents were neutral and none strongly disagreed with this question.

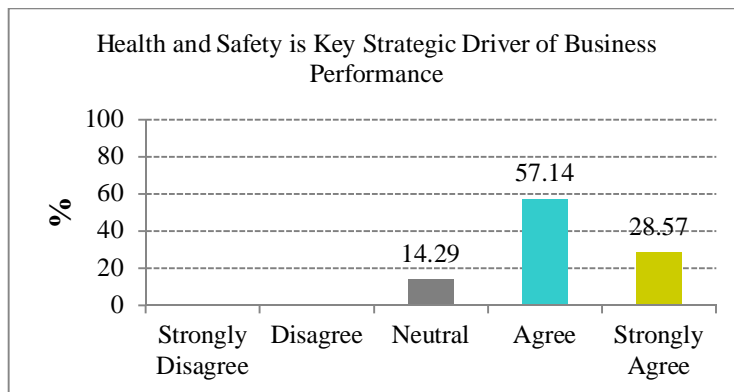


Figure 0.10: Health and Safety is Key Strategic Driver of Business Performance

Figure 0.10 shows that 57% of the respondents agree and 29% strongly agree occupational health and safety is a key strategic driver of business performance within the Rio Tinto group of companies while 14% remain neutral about this concept. None of the participants disagreed with this concept and none were neutral.

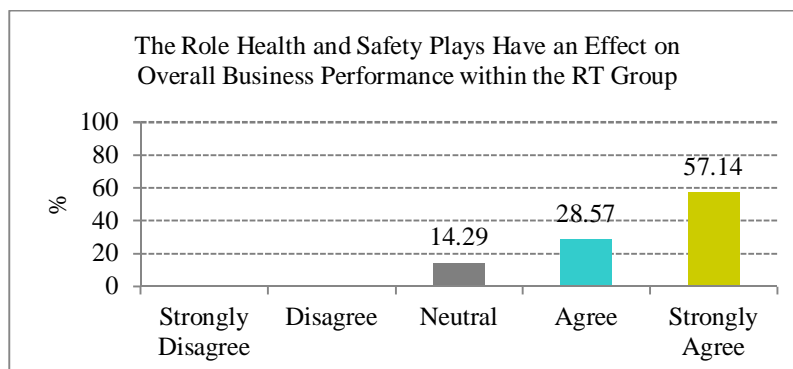


Figure 0.11: The Role Health and Safety Plays Have an Effect on Overall Business Performance with the Rio Tinto Group

The responses displayed in figure 0.11 indicate that 57% strongly agree and 29% agree that the role played by occupational health and safety within the organisation does have an effect on overall business performance within the Rio

Tinto group. 14% of the respondents remain neutral. None of the participants disagreed with this concept and none were neutral.

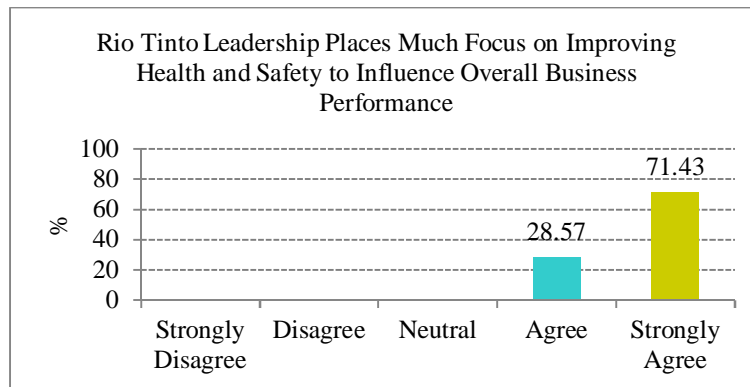


Figure 0.12: Rio Tinto Leadership Places Much Focus on Improving Health and Safety to Influence Overall Business Performance

Figure 0.12 shows that a collective of 71% and 29% strongly agree and agree respectively that Rio Tinto leadership places much focus on improving health and safety with the intention of influencing organisational performance. None of the participants disagreed with this concept and none were neutral.

Discussion of Findings from Primary Study: The study aimed to critically assess whether there is a correlation between occupational health and safety performance and business performance. In order to achieve this, it was necessary to meet the research objectives. The research objectives for this study were to be achieved through three main research questions. The research questions for this study are answered below.

Research Question #1: Does occupational health and safety have a role to play in business performance within the Rio Tinto Group?

This research question was answered by the feedback received from Part II of the questionnaire in Appendix C of this study. This question wanted to establish whether occupational health and safety has a role to play in business performance. This study revealed that, occupational health and safety does have a role to play in business performance.

Feedback from the primary research as outlined in the responses shown in figure 0.5 revealed that occupational health and safety is very important to Rio Tinto with 100% of the respondents strongly agreed to this aspect. In terms of the importance of occupational health and safety to business performance, 100% of the respondents also strongly agreed that occupational health and safety are very important components of overall business performance. Thus, there is a strong believe amongst the senior leadership of Rio Tinto that occupational health and safety does have a role to play in business performance. This is supported by Hesapro (2012: 12) who noted that occupational health and safety programmes, systems and practices form an integral part of the business strategy including the cycle of continuous improvement driving a firm towards excellence.

This study could determine that occupational health and safety does have a role to play in business performance and a conclusion can, therefore, be drawn that health and safety does have a role to play in the business performance aspect of profitability.

Research Question #2: Do improvements in occupational health and safety have an effect on overall business performance?

Results from the primary research study showed that improvements in occupational health and safety brought about improvements in overall business performance with 86% of respondents being strongly agreeing to this aspect. This is clearly depicted in figure 0.7. In addition to this, a combined 90% of respondents placed high importance on the role that the introduction of the integrated HSEQ MS played with regards to the improvements of business performance within Rio Tinto as shown in figure 0.8.

This implies that improvements in occupational health and safety have led to improvements in profitability, consequently; making health and safety one of the key drivers of profitability within Rio Tinto. The work undertaken by Rio Tinto leading to the reduction in incident rates from 1.8 to 0.4 since 2003 (Rio Tinto, 2016: 2) is evident to this meeting this research objective within the RT group.

Research Question #3: Is occupational health and safety a key driver of profitability within the Rio Tinto Group of companies?

Results from the primary study indicated that occupational health and safety is a key strategic driver of business performance within the Rio Tinto group of companies with a collective 86% respondents being in agreement with this aspect. The study also found that there is a strong belief that Rio Tinto leadership places much focus on improving health and safety with the intention of influencing organisational performance with 100% of the respondents agreeing to this concept as shown in figure 0.11 and figure 0.12. This supports the work by Gahan et al. (2014: 13 – 17) which proved that good occupational health and safety practices are widely considered as a driver of competitive advantage leading to increased profitability and as well as reputational gains for businesses.

Further inputs from the respondents has confirmed key drivers of profitability being financial (capital and assets), human capital investments (strong leadership) as well as using health and safety as the licence to operate (fatality elimination, catastrophic event prevention and promoting behavioural safety). This describes why Rio Tinto identified and drives health and safety as a key strategic aspect of competitive advantage to be used as a vehicle for bringing about profitability to the firm, as evidently confirmed by its executive leadership.

Improvement Opportunities

Part IV of the research questionnaire contained four questions dealing with recommendations for improvement. Feedback was sought from the respondents as to what recommendations for improvement could be made to the Rio Tinto Group to further improve and leverage on occupational health safety to improve business performance. The results are summarized below, lined up per question.

According to the respondents, the key drivers of profitability within the Rio Tinto group of companies are gross margin, operating costs and productivity and capital discipline. In addition to this, Rio Tinto must work to unlock the true potential of its employees and eliminate waste within its processes and systems. Speed of execution and value creation are drivers of profitability that should be used as anchors and vehicles of change and optimisation for the mining giant. Further to this, having a solid and aligned strategy, using safety as the licence to operate, having assets (mines and plants) and a rich and diverse culture are also key drivers of profitability.

The key levers of occupational health and safety performance include strong leadership, fatality elimination, catastrophic event prevention and promoting behavioural safety including the monitoring injury frequency rates, health and safety audits and inspections. The recruitment of leadership that will create a culture of performance and HSE leadership in industry are also deemed as key drivers of health and safety performance as this will drive ownership amongst employees and contractors. Accountability and expectation setting remain key levers that Rio Tinto should keep pulling, so are system design and diversity which will give it the competitive advantage.

Further to this, the participants recommended that Rio Tinto should employ the following strategies in order to improve occupational health and safety and overall business performance; a clear strategy that drives culture, policies and standards, leadership capabilities and HSEQ systems. The simplification of systems, a drive for more organisational discipline and creating a culture of interdependence amongst the employees is an enabler that can be of great advantage to Rio Tinto. The key enablers to further push health and safety improvements should include more emphasis on behavioural psychology and social conformance studies in order to better understand ways to more effectively influence positive behaviours. More emphasis needs to be placed on fatigue management and mental health, both of which severely impact people's ability to focus and work safely. Developing and improving overall leadership capabilities across the Rio Tinto group are key points of improving health and safety and business performance. Empowering and engaging employees especially at front line level will bring about the mayor change and can act as the main enabler to these improvements. Finally, the drive on managing critical risks within the organisation should remain and be sustained.

Results from Desk Study

Analysis results from the desk study were analysed using MS Excel software and the outputs are presented below. The information was graphically represented per product group under study for ease of information flow, to promote understanding as well as demonstrate existence of the correlation. The coefficient of determination is used to explain the existence of a correlation, and is interpreted as the proportion of the variance in the dependent variable that is predictable from the independent variable. Hence, the coefficient of determination is used to explain whether the variability in ROA can be explained by the AIFR in each product group.

Individual Rio Tinto Product Group Analysis

Analysis were done for the entire period under study and presented as such in order to have a full view of the review period as well as compare the two parameters under study graphically together. In this section, the results of each group within Rio Tinto are discussed over the period under review (that is, between 2011 and 2015).

Aluminium Group

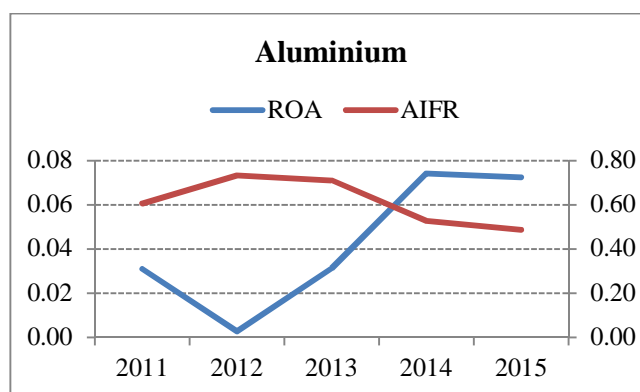


Figure 0.13: Aluminium Group Information

The graph for the Aluminium group is displayed in Figure 0.13. It can be seen that for this group, there is a relationship between AIFR and ROA across the period under review. The coefficient of determination between AIFR and ROA is 0.85, meaning that the 85% of the variability in the ROA can be explained by the AIFR in this group. This product group did not undergo a lot of portfolio changes, and hence the results are consistent with the hypothesis testing that is done in Appendix E.

Copper & Coal Group

The graph for Copper and Coal group is displayed in figure 0.14 for the period under review. It can be seen that for this product group, there is a relationship between AIFR and ROA across the period under review. The coefficient of determination between AIFR and ROA is 0.65, meaning that the 65% of the variability in the ROA can be explained by the AIFR in this group. This group did not undergo a lot of portfolio changes; but significantly did as compared to the

Aluminium group; hence a difference in the coefficient of determination, and consequently the results are consistent with the hypothesis testing that is done in Appendix E.

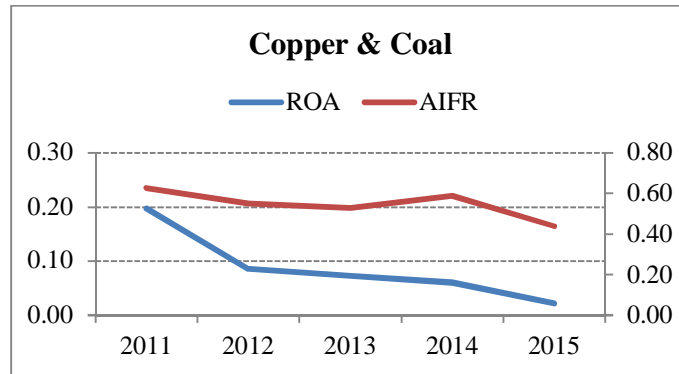


Figure 0.14: Copper and Coal Group Information

Iron Ore

The graph for the Iron Ore Group is displayed in figure 0.15 for the period 2011 to 2015. It can be seen that for this group, there is a no relationship between AIFR and ROA across the period under review. The coefficient of determination between AIFR and ROA is 0.19, meaning that only 19% of the variability in the ROA can be explained by the AIFR in this group. This group went through lots of portfolio changes; hence a much lower coefficient of determination, and consequently the results are not consistent with the hypothesis testing as elaborated further in Appendix E.

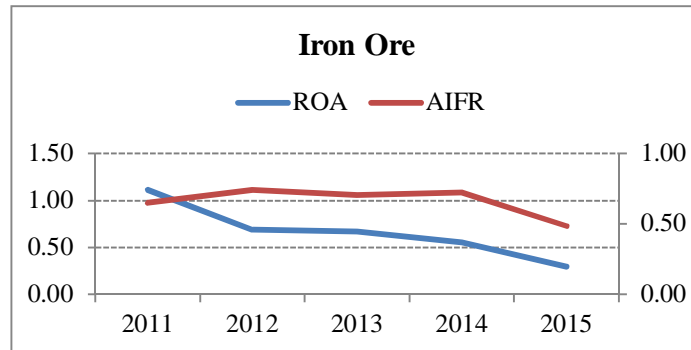


Figure 0.15: Iron Ore Group Information

Diamonds and Minerals Group

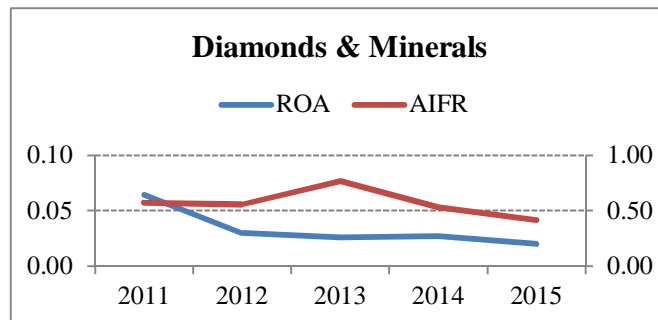


Figure 0.16: Diamonds and Minerals Group Information

The graph for the Diamonds and Minerals Group is displayed in figure 0.16 for the period 2011 to 2015. A favourable relationship exists in this product group; however this is only evident in 2011. The upcoming years under review do not show a favourable correlation between AIFR and ROA. The coefficient of determination between AIFR and ROA is 0.10, meaning that only 10% of the variability in the ROA can be explained by the AIFR in this group. This is explained by fact that the group went through mayor portfolio changes including various divestments and business units' sales; hence a much lower coefficient of determination among the groups. Consequently the results are not consistent with the hypothesis testing that is done as further elaborated in Appendix E.

Discussion of Findings from Desk Study

The study aimed to critically assess whether there is a correlation between occupational health and safety performance and business performance. In order to achieve this, it was necessary to meet the research objectives using a desk study approach in conjunction with the primary study. The research objectives for this study were to be achieved through three main research questions.

Research Question #1: Does occupational health and safety have a role to play in business performance within the Rio Tinto Group?

This research question was answered by the analysis done from 2012 until 2015 as well as the statistical analysis displayed above in Section 0. The findings from the desk study particularly from year 2012 through to 2015 (Appendix E) as well as the combined performance over the five years does show that occupational health and safety does have a role to play in business performance within the Rio Tinto group such that where occupational health and safety performance was good, profitability as indicated by ROA was also good. This was strongly present in the Aluminium product group. The existence of a correlation in these years under study as well the associated rejection of the null hypothesis for the period ranging from 2012 through to 2015 proved the role that health and safety plays within the organisation. Further to this, the summary tables as well as the analysis of variance tables for 2012 through to 2015 did show that there is a correlation between occupational health and safety performance and business performance (Appendix E).

In essence, the study revealed that a relationship does exist between occupational health and safety performance and business performance within the Rio Tinto group of companies. Further to this, a correlation was established in that as occupational health and safety performance improves, profitability also improved. This was mainly evident in the Aluminium and Copper and Coal product groups. It was not as prominent in Iron Ore and Diamonds and Minerals product groups mainly due to organisational restructuring, growth and divestments; however a relationship could be established in the statistical analysis for all product groups.

This study could determine that occupational health and safety does have a role to play in business performance and a conclusion can, therefore, be drawn that health and safety does have a role to play in the business performance aspect of profitability.

Research Question #2: Do improvements in occupational health and safety have an effect on overall business performance?

The desk study was able to establish that improvements in health and safety have an effect on business performance. Data analysis from 2011 showed there was no correlation between occupational health and safety and business performance, however the next four years under study showed the existence of a correlation, meaning that health and safety performance does have an effect on business performance within Rio Tinto. This implies that after improvements were made in the business pertaining to health and safety systems with emphasis on the introduction of the business strategy aligned HSEQ management system (Rio Tinto, 2012: 2), health and safety performance improved and so did business performance.

Thus, it has been confirmed through this study that improvements in health and safety do have an effect on business performance. The drop in incident rates declining by over 80 per cent between 1998 and 2006, and further continued drop of roughly 15 – 20 per cent per year from 2006 to 2010 (Rio Tinto, 2012: 2) is evident to this claim. This implies that improvements in occupational health and safety have led to improvements in profitability, consequently; making health and safety one of the key drivers of profitability within Rio Tinto.

Research Question #3: Is occupational health and safety a key driver of profitability within the Rio Tinto Group of companies?

The desk study established through the differences observed between 2011 and the rest of the following years under study that improvements in health and safety does have an effect on business performance. This was also evidently observed in the ANOVA Tables from 2012 till 2015 (Appendix E) with a correlation between occupational health and safety and profitability being evident from this period onwards while being absent in 2011. Thus, result comparison between 2011 and from 2012 and beyond showed that improvements in occupational health and safety systems have led to improvements in profitability implying that health and safety are indeed key drivers of profitability within the Rio Tinto group of companies. According to Hesapro (2013: 11) occupational health and safety programmes do generate effects and outcomes that positively influence organisational performance and thus, contributing to the achievement of company goals and objectives.

Conclusions and Recommendations

Presentations of the Findings

The findings from the research study are discussed under two main headings namely; key findings from the literature review and key findings from the primary research study listed under 0 and 0 respectively.

Findings from the Literature Review: Extensive review of relevant literature was done in order to determine if occupational health and safety had an impact on business performance with particular emphasis on profitability. A summarized report on the literature review is presented under this heading.

Role of occupational health and safety on business performance: The business case for investing in good occupational health and safety systems and practices is usually based on the assessment that such investments can result in improved business performance and profitability in a number of different ways, including the lowering of overall compliance costs, reducing sickness on-the-job, reducing costs associated with workplace accidents and fatalities and those associated with return-to-work processes. There is also a reduction in labour costs associated with absenteeism and turnover as well as higher levels of employee productivity as a result of improved morale, motivation, commitment and/or engagement. Work processes tend to become more efficient and there is better risk management resulting in overall improvement in business reputation (Gahan et al., 2014: 10).

It is further believed that occupational health and safety programmes generate effects and outcomes that positively influences company performance and which contribute positively to the goals of an organisation. However, in order to have an effective influence on organisational performance, the occupational health and safety programme must be aligned with the firm's goals and objectives (Hesapro, 2012: 11 – 12). This implies that occupational health and safety programmes, systems and practices must form an integral part of the business strategy including the cycle of continuous improvement driving a firm towards excellence. According to Hesapro (2012:12) positive outcomes such as less cost, improved company image, less staff turnover and higher productivity makes occupational health and safety a key role player in business performance.

Occupational health and safety and business performance

The Rio Tinto approach to health and safety management is of an integrated nature where integrated series of processes, procedures, plans and tools have been put together for use to manage the mining group's day-to-day HSEQ responsibilities, identify and manage its risks & obligations and support improving its overall performance. The group has developed a central global HSE programme, whereby all group product groups are required to meet the same standard of practice in order to manage risk and improve HSE performance. The programme supports the group to achieve its performance objectives (Rio Tinto, 2012: 2).

The firm's vision is clear and the underlying driver is that workers safety is all "about people and not numbers" (Rio Tinto, 2012: 1). For Rio Tinto, the efforts to reduce incidents, injuries and fatalities ultimately led to dramatic and consistent safety gains. This is visible in the drop in incident rates declining by over 80 per cent between 1998 and 2006,

and further continued drop of roughly 15 – 20 per cent per year from 2006 to 2010 (Rio Tinto, 2012: 2). More recent figures confirm that over the last 15 years, the all injury frequency rate has reduced by 85 per cent (Rio Tinto, 2014: 2).

There is a strong correlation between performance in terms of competitiveness and incident rates from an occupational view point and Rio Tinto has managed to prove this right by reducing its all injury frequency rate as measured per 200 000 hours worked from 1.8 to 0.4 since 2003 (Rio Tinto, 2016: 2). This implies the effects of the improved, integrated and continuously improving management system the firm uses to manage its HSEQ risks.

Occupational health and safety as a key driver of profitability

According to Gahan et al. (2014: 13 – 17) research has shown that good occupational health and safety practices are widely considered as a driver of competitive advantage, enhanced status from the stakeholders' viewpoint and increased profitability and as well as reputational gains. The case for investing in better occupational health and safety outcomes represents strategic value to the business, rather than simply an avenue for immediate economic value. Former BHP Billiton CEO, Mr. Chris Goodyear emphasised the disadvantages a poor image occupational health and safety can create to a business describing health and safety practices as a “powerful competitive differentiator”. Impacts on a business include setting up the company of choice, giving better access to markets, natural resources and the best and brightest employees” (Goodyear 2006 cited in Young and Thyl, 2009: 170).

There are several contributors to value creation and that health and safety at work is one such key element. This becomes even more important in that human capital is a key pre-requisite to business development and thus, the need to ensure healthy and safe working conditions that will in turn facilitate productivity (Hesapro, 2013: 4). An element of key importance is the quality of the workforce, its management and its working conditions and it has been generally recognized that improving quality of working life and rising productivity do tend to go hand in hand (Hesapro, 2013: 5).

Hesapro (2013: 11 – 13) cited that occupational health and safety programmes generate effects and outcomes that positively influence performance at organisational level thus, contributing to the achievement of company goals and objectives and emphasised the importance of these two aspects being aligned. This was demonstrated in various cases studies investigated by the Hesapro research partners where they found that investing in occupational health and safety programmes led to positive results for the organisations as a whole further stressing the point out that health and safety is not only an ethical and legal obligation but also one with economic benefits for organisations (Hesapro, 2013: 13).

Various case studies found a correlation between implementing health and safety initiatives and improved business productivity and overall economic performance. The results of the study by Sockoll et al. (2009: 52 – 55) showed that a highly developed management system increases the safety performance in terms of injuries, illness and absenteeism, as well as the competitiveness and the economic-financial performance. In this study, benefits were directly linked to quantifiable financial outcomes that directly improved the bottom line. This was further supported by evidence from 55 UK case studies done in 2008 by PriceWaterhouseCoopers which clearly showed that occupational health and safety programmes resulted in financial benefits in two main ways, namely; cost savings and additional revenue generated through higher productivity (Sockoll et al., 2009: 48 – 49).

The benOSH study done by De Greef et al. (2011: 53) further showed positive results of investing in occupational health and safety programmes as the majority of the case studies undertaken clearly demonstrated that health and safety interventions lead to positive economic indicators. Further findings confirmed the biggest motivation for firms pushing for occupational health and safety programmes being that they can improve productivity and overall business performance (Kirsten, 2010: 251 – 255).

Findings from the Primary Study

Findings from the primary study are presented in accordance to the extent in which the research questions were answered. These are summarised below.

This study revealed that occupational health and safety does have a role to play in business performance. This was evident in the strong believe amongst the senior leadership of Rio Tinto regarding this aspect. It was further revealed that

improvements in occupational health and safety brought about improvements in overall business performance. Occupational health and safety was also confirmed to be a key strategic driver of business performance within the Rio Tinto group of companies. This finding was strengthened by the fact that there was a strong believe that Rio Tinto leadership places much focus on improving health and safety with the intention of influencing organisational performance. This finding justified why Rio Tinto uses health and safety as a key aspect of competitive advantage.

Findings from the Desk Study

Findings from the desk study are presented in accordance to the extent in which the research questions were answered. These are summarised below.

The desk study was able to show that occupational health and safety does have a role to play in business performance within the Rio Tinto group such that where occupational health and safety performance was good, profitability was also good. A correlation was established showing that where occupational health and safety performance improved, profitability also improved. The strongest correlation was present in those product groups with none or minimal portfolio changes (namely, Aluminium and Copper & Coal).

Further to this, it was revealed that improvements in occupational health and safety systems do have an effect on business performance as was evident in Aluminium and Copper & Coal product groups. This made occupational health and safety a key driver of profitability within the Rio Tinto group of companies.

A more general finding in this study is that where the product groups' portfolios were stable, better, more representative analysis could be performed.

Conclusions on Findings

This study revealed that, occupational health and safety does have a role to play in business performance as was cited in the research by Gahan et al. (2014: 13 - 17) which showed that good occupational health and safety practices are widely considered a driver of competitive advantage, enhanced status from the stakeholders' viewpoint and increased profitability and as well as reputational gains. This role is indeed a key role in that both aspects of the study (namely; primary and desk study) were able to establish that improvements in occupational health and safety brought about improvements in overall business performance within Rio Tinto. Evident to this is the drop in incident rates declining by over 85 per cent over the last 15 years (Rio Tinto, 2014: 2).

Moreover, the study confirmed that good occupational health and safety practices are widely considered as a driver of competitive advantage, enhanced status from the stakeholders' viewpoint and increased profitability and as well as reputational gains. The case for investing in better occupational health and safety outcomes represents strategic value to the business, rather than simply an avenue for immediate economic value Gahan et al. (2014: 13 – 17). From the analysis above, since Rio Tinto introduced its integrated system for managing health and safety, profitability also improved as was shown predominantly in the Aluminium product group and to a lesser extent in the rest of the product groups. This confirm the role that health and safety plays within an organisation, particularly that of being a powerful competitive differentiator and how it is a key pre-requisite to business development by facilitating productivity (Hesapro, 2013: 4).

Finally, the study was able to confirm occupational health and safety as one of three key drivers of profitability featuring amongst financial and human capital drivers. This implies its role and impact on business performance within the Rio Tinto group of companies.

Recommendations

Based on the findings of this research and proposals from the participants, it is recommended that Rio Tinto considers employing the following strategies in order to improve occupational health and safety and overall business performance in its business model:

- Employ a clear strategy that drives culture, policies and standards, leadership capabilities and HSEQ systems. The simplification of systems, a drive for more organisational discipline and creating a culture of interdependence amongst the employees are enablers that can be of great advantage to Rio Tinto.
- Simplify and integrate health and safety into its management system and use it for all elements of management. The focus should be on quality implementation of occupational health and safety initiatives with aligned drivers and this should bring about greater business outcomes for the entire group.
- Key enablers to further push health and safety improvements should include more emphasis on behavioural psychology and social conformance studies in order to better understand ways to more effectively influence positive behaviours.
- More emphasis needs to be placed on fatigue management and mental health, both of which severely impact people's ability to focus and work safely.
- Developing and improving overall leadership capabilities across the Rio Tinto group are key points of improving health and safety and business performance.
- Empowering and engaging employees especially at front line level will bring about the mayor change and can act as the main enabler to these improvements.
- Within the space of optimising health and safety and business performance, proposals from the participants include putting a true value of money on incidents and injuries. The suggestion given is that a poor performing team can be chosen and be used as a case study on culture change. Such a team will be given the necessary training, coaching and associated support and will be monitored for change. Depending on the success of such a study, learnings from such a study can then be replicated to the rest of the business units.
- Sustain the ongoing critical risk management programme and retain it as a key focus area for the business in bringing about the required change in the space of personnel occupational health and safety management.

Areas for Further Research

Since this study had limitations and delimitations, the following areas are suggested for further research:

- A similar study could be extended to the entire Rio Tinto Group changing the focus from being primarily a desk study and focus on the opposite, such that more data be collected via primary means to assess the role that occupational health and safety has on business performance from more employees' viewpoints.
- Various factors influence business performance, a similar study could be done to determine the other factors affecting business performance and getting an in-depth understand of such factors and leveraging on them.
- Use of other indicators to measure overall business performance, such as Return on Equity (ROE), Return on Income (ROI) and Net Profit Margin to measure business performance and a leading indicator to measure health and safety performance.
- A similar study could be carried out to measure factors that lead to productivity within the Rio Tinto group of companies.
- Since product group portfolio stability played a role in the desk study analysis, it is recommended that a similar study be done per business unit over a longer time period.
- The data collected was for a 5 year period ranging from 2011 to 2015 and it can be seen from the study that this could not project longer term trends particularly in a dynamic and changing economic environment. Thus, it is recommended that this study be extended to prior years, starting for example with the time of the introduction of the occupational health and safety standards after the Lassing Magnesium Silicate mine incident.

Conclusion

The study concluded that occupational health and safety does have a role to play in business performance and that it does impact upon business performance, such that improvement in occupational health and safety systems and processes did bring about improvements in overall business performance within Rio Tinto. The study was also able to confirm that good occupational health and safety practices are indeed a key driver of competitive advantage. Findings from the study, particularly depicted in the performance of the aluminium product group which was the most stable in terms of portfolio changes also confirmed that as health and safety performance improves, profitability also improves.

Hesapro (2012: 9) stated earlier that that good workplace conditions do lighten the burden on the global economy and fosters economic growth and thus, this study was able to get to the same conclusions. This implies that businesses should embark on this information positively, in their strategies going forward, as the benefits extend beyond profits.

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