

PREDICTORS OF ADHERENCE TO CORPORATE SOCIAL RESPONSIBILITY PRINCIPLES IN SOUTH AFRICAN JUNIOR MINING COMPANIES IN MPUMALANGA PROVINCE

Letshitshi Toby Maleejane

UNISA Graduate School of Business Leadership (GSBL)
Corner of Janadel and Alexandra Avenues, Midrand, 1686, South Africa

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Abstract: The objective of study was to identify and quantify key predictors of the basic principles of corporate social responsibility in South African junior mining companies operating in Mpumalanga Province. The study was conducted by collecting data from 152 highly experienced employees of junior mining companies operating in the province. The degree of adherence to corporate social responsibility in junior mines was assessed by using a composite index constructed by Ganda (2018). Data was gathered on 39 socioeconomic variables that are known to affect productivity, operational safety and efficiency, environmental safety, occupational health, level of technical skills, the use of appropriate equipment and technology, and general working conditions. Data analysis was performed by using ordered logit analysis. By the standards of Ganda (2018), 113 of the 152 respondents of study (74.34%) indicated that their junior mining companies adhered sufficiently enough to the basic principles of corporate social responsibility. Adherence to the basic principles of corporate social responsibility in junior mining companies was significantly influenced by the degree of awareness about the potential benefits of corporate social responsibility to junior mining companies, operational cost and market demand for mine products, in a decreasing order of strength.

Keywords: Junior mining companies, Corporate social responsibility, Ordered logit analysis

JEL classification: D2, O47, O49

Introduction

Frederiksen (2018) has shown that South African junior mines must adhere to the basic principles and guidelines of corporate social responsibility in order to safeguard the strategic interests of communities who live around junior mines. Block, Johnson, Nkosi and Ehrlich (2018) have highlighted the need for protecting the environment in which mining communities operate from hazardous mining activities and pollution. An exploratory survey was carried out in the Province of Mpumalanga in South Africa in order to assess and evaluate the extent of awareness about corporate social responsibility in junior mines. A survey was conducted by collecting data from 152 highly experienced experts who have been working in the mineral processing industry of Mpumalanga for several years. The expected output of survey was to find out why a large number of junior mining companies were out of production, and to seek appropriate remedial measures. The research was carried out at a time of falling demand for commodities produced by mines at local and global levels as well as an increase in the number of small mining enterprises closing down operation due to various socioeconomic reasons.

Frederiksen (2018) has shown that junior mining companies must explore innovative ways and means of adhering to the basic principles of corporate good governance without escalating their operational cost. The plight of communities living in and around mining sites has been brought to the full attention of the South African National Department of Mineral Resources (2020) and the South African Chamber of Mines (2019). Both institutions require South African junior mining companies to produce a detailed business plan in which issues of corporate social responsibility (CSR) are adequately addressed as a means of protecting the general environment and health of communities living in and around junior mining companies. By law, South African junior mining companies are required to protect the lives, health and livelihood of communities living in and around mining sites. South African law requires all junior mining companies to comply with requirements that are related to occupational health and safety, health education, environmental sanitation, proper waste management, and community based development programmes. Such requirements are based on indicators that are used in all junior mining companies in countries

such as China, Brazil, Australia, Canada, USA and Russia (Zhang, 2017).

Carvalho (2017) has shown that corporate social responsibility is vital for ensuring sustainable development in all mining communities. In order to ensure sustainable development in junior mines, the interest of communities living in and around junior mines should be taken into account by mining companies. Choi and Song (2017) have carefully analysed the internal value chain of the mining sector of the economy, and have reported that a company might discover that economic profits are carried in downstream activities such as distribution or customer service, but not in upstream activities in basic mining or processing. The study by Worku (2017) has shown the need for political commitment, legislative acts and good leadership qualities as a means of ensuring and protecting the mutual survival of junior mining companies and communities living in and around junior mining companies. The author has shown that the ability and commitment to protect the general environment in and around junior mining companies is a key requirement for long-lasting and mutually beneficial relationships between mining companies and local communities in which the mines operate. Tost, Hitch, Chandurkar, Moser and Feiel (2018) have argued that environmental sustainability considerations must be factored in at the planning stage in all mining operations in order to avoid clashes and hostility at a later stage. According to the authors, it is essential to plan appropriately before commencing production. The ability to operate junior mines cost-effectively and the degree of utilisation of innovative methods of mining, production, marketing and sale of commodities are vital to stay in business.

Following the falling demand for commodities in China, junior mining companies have suffered a huge loss in revenue (Tuokuu, Idemudia, Gruber & Kayira, 2019). Identifying and clarifying environmental policy best practices for the mining industry is a key responsibility of local municipalities and the South African Government. According to the authors, it may take quite long before the demand for mining products and minerals picks up again. As such, junior mining companies are going through difficult economic times in South Africa. It follows that junior mining companies should explore innovative methods of production in which they sustain their operations without neglecting their corporate social responsibilities.

The study was conducted in an attempt to shed light on the worsening economic plight of junior mining companies operating in Mpumalanga Province. The region is fraught with massive unemployment, lack of infrastructure and environmental pollution arising from mining activities. Junior mines provide employment opportunities to graduates of high schools and educational institutions operating in the region. There is a significant lack of vocational and specialist skills that among the youth. Employment opportunities are scarce. Annual reports issued by the South African Chamber of Mines (2019), the South African National Department of Mineral Resources (2020) and Statistics South Africa (2019) show that Mpumalanga Province is characterised by unemployment, environmental pollution and lack of foreign and local direct investment. Experiential and vocational training opportunities are scarce in the province. The problem of environmental pollution arising from industrial and mining activities undermine the overall health condition of the population living in the province. Workplace training opportunities could be used for improving the degree of skills possessed by young people (Uys & Webber-Youngman, 2019).

Singh (2017) has argued that the task of ensuring sufficient adherence to basic principles and guidelines of corporate social responsibility in South African mines is the ultimate responsibility of the South African Government. The author has highlighted the need to enhance awareness by promoting education on the potential benefits of corporate social responsibility. Junior mines could use workplace training as a means to improve the degree of tailor-made vocational and artisan skills among workers who lack such skills at the workplace. Workplace training must be relevant to the KPAs and KPIs of employees in order to be effective. This is because any workplace training must be of high quality and relevance to the operations that are carried out at the workplace. Workplace training entails dedication and the availability of resources such as training budget, money for trainers and venues for training. Junior mines often need to cut down operational cost in order to make profit. This means that junior mines are required to attract highly skilled and dedicated employees although they are unable to pay them attractive salaries. Junior mines are also required by law to adhere to the South African Labour Relations Act of 1996 in the course of routine mining operations (South African National Department of Mineral Resources, 2020). In an attempt to ensure productivity and quality production, junior mines are required to balance operational needs with effective incentives for employees with vital skills. Apprenticeship is a typical model used for ensuring the retention and development of specialised skills in junior mines. It requires the availability of resources such as money, trainers with proven skills and economic incentives to young trainees. Apprenticeship is not always affordable to junior mines. This is because it requires employers to provide employees with economic incentives such as basic income,

decent working conditions and insurance cover. As a result, junior mines fail to utilise and benefit from apprenticeship.

Background

The study conducted by Mthenjane (2019) has shown that there is a dire need for ensuring adequate adherence to corporate social responsibility principles and guidelines in all South African junior mining companies. Junior mining enterprises operating in Mpumalanga Province lack the resources for competing with large mining enterprises for various reasons. They have limited access to local and international markets. They are often required to abide by legislation that applies to large and adequately resourced mining companies. They are constrained by acute shortage of finance and inability to secure loan. They are also obliged to abide by the Labour Relations Act of 1996. In an attempt to ensure viability and profitability, junior mines are constantly required to look for innovative methods of saving operational cost. They are also required to utilise modern technological methods of operation, production, mineral processing and marketing. They have limited access to local and international markets. The tax burden on emerging mines is a major obstacle to profitability in the sector. Often, the tax assessment made on junior mines is unfair, and fails to take into account missed economic opportunities at local and international levels, lack of access to lucrative global markets, the acute shortage of vocational and artisan skills, intense competition from well-established and large mining companies, labour unrest and economic downturn. Neingo and Tholana (2016) have shown that junior mining companies need assistance in terms of building capacity for sufficiently adhering to the basic principles of corporate social responsibility in the course of mining operations. In this regard, junior mining companies can enhance their overall productivity by using innovative methods such as workplace training and skills based short courses for their middle level managers and team leaders. Rodrigues and Mendes (2018) have shown that it is possible to improve productivity by utilising on-the-job training and tailor-made short learning programmes for employees working in junior mining companies.

Literature review

The total population of Mpumalanga Province is 4.7 million (Statistics South Africa, 2019). The total area of Mpumalanga Province is 76, 495 square km. The province has a population density of 53 people per square km. Black South Africans account for about 90.7% of the population of Mpumalanga. White South Africans account for about 7.5% of the population of Mpumalanga. The percentages of coloured and Asian South Africans are 0.9% and 0.7% respectively. Swazi is spoken by about 27.7% of the population of Mpumalanga. The other languages spoken in Mpumalanga Province are Zulu (24.1%), Tsonga (10.4%), Southern Ndebele (10.1%), Pedi (9.3%), Afrikaans (7.2%), Southern Sotho (3.5%) and English (3.1%). Mpumalanga is home to several mining companies including junior mining companies. Mpumalanga is home to minerals such as gold, platinum group metals, silica, chromite, vanadiferous magnetite, argentiferous zinc, antimony, cobalt, copper, iron, manganese, tin, coal, andalusite, chrysotile asbestos, kieselguhr, limestone, magnesite, talc and shale (Moomen & Dewan, 2017). Gold was first discovered in Mpumalanga province in 1883 by Auguste Roberts in the mountains surrounding what is now Barberton. Gold is still mined in the Barberton area (Moroe, Khoza-Shangase, Madahana & Nyandoro, 2019).

Mpumalanga accounts for 83% of South Africa's coal production. The province produces about 90% of total coal consumption in South Africa that is used for the generation of electricity synthetic fuel processing. Coal power stations are in proximity to the coal deposits. A coal liquefaction plant in Secunda (Secunda CTL) is one of the country's two petroleum-from-coal extraction plants, which is operated by the synthetic fuel company Sasol. The highveld region is the most polluted of the world due to the mine industry and plant power stations (Murray, Davies & Rees, 2011).

Mardonova and Choi (2018) have shown that junior mining companies in Mpumalanga experience developmental challenges. A few examples of such challenges are inability to raise money, shortage of specialised and technical skills, poor demand for commodities in local and global markets, high labour cost, stringent labour conditions and legislation, lack of access to local and global markets, intense competition from large mining enterprises, high tax, high cost of electricity and transpiration and high insurance cost. Mpumalanga is home to a large number of junior mineral processing companies that operate as private enterprises in the South African mining industry. The study was conducted against the need to assess and evaluate the views held by the experts on major causes of underperformance and bankruptcy in the mineral processing industry. Very few studies have been conducted to

date in the junior mining sector of Witbank about socioeconomic factors that adversely affect overall productivity and operational cost and the potential benefits of providing tailor-made workplace training opportunities to employees. Workplace training opportunities are vital for employees of small mining enterprises based on assessments made in the past several years (Mahase, Musingwini & Nhleko, 2016).

A typical feature of South African small mining enterprises is shortage of vocational and specialized skills, lack of access to finance by formal money lending institutions, high cost of labour, high cost of transportation, poor access to local and global markets, high tax and lack of incentives to productive and loyal employees. The potential benefits of workplace training programmes to workers employed by small mining enterprises have been outlined by Lebre, Corder and Golev (2017). Studies conducted by Lauwo (2018) have shown that workplace training opportunities are vital for improving overall productivity in small mining enterprises and for enhancing adherence to corporate social responsibility principles and guidelines.

Katz and Pietrobelli (2018) have shown the numerous benefits of enhancing the degree of awareness about the benefits of good environmental sanitation, the protection of local communities, and adherence to corporate social responsibility principles and guidelines. The authors have shown that optimising resources is critically vital for performing at full potential in newly established enterprises such as junior mining companies. Outsourcing is commonly used as a cost-cutting measure. However, using outsourcing for the wrong reasons could result in the loss of vital skills and expertise (Ilankoon, Tang, Ghorbani, Northey, Yellishetty, Deng & McBride, 2018). The current state and future directions of percolation leaching in the Chinese mining industry: Challenges and opportunities. The mining industry is central to the South African economy. The current decrease in commodity price has triggered a flood of disinvestment in the mining industry. The key losers have been small mines. A review of the literature shows that each mine needs a tailor-made solution and strategy for cost saving and enhancement of overall productivity. Solutions that have produced results in large mining companies are not necessarily feasible in small mining companies. There is a need for tailor-made solutions that could work in small companies. The specific objectives of study were to identify and quantify factors that affect productivity at junior mining companies.

Holmberg, Kivikyto-Reponen, Harkisaari, Valtonen and Erdemir (2017) have shown that workplace training is a cost effective tool to develop the overall productivity of employees. It is directed at improving employee's job performance and brings about required behavioural changes to meet the organisational goals. The benefits of training are but not limited to, improving job knowledge and skills at all levels of the organisation, assist in developing leadership skills, assist in increasing productivity or quality of work and to reduce external consulting costs by utilising competent internal consulting. There are various training deliveries and approaches.

According to Frederiksen (2019), ensuring the mastery of technical skills at global standards is a critical requirement for financial sustainability in enterprises such as small mineral processors. The study conducted by Frederiksen (2018) has shown that commodity markets are most vulnerable to low demand. The author has pointed out that the price of commodities such as mineral products requires the highest standards of innovative skills in order for junior mining enterprises that produce the products to stay competitive in the global market. Workplace training could be offered by using methods such as coaching and one-to-one instruction as a means of transferring knowledge and skills from a more experienced person to someone else who needs to improve the current degree of knowledge and overall productivity. Job rotation entails staff being transferred from job to job on a systematic basis, thus creating greater flexibility and skills within a team (Figueiredo & Piana, 2016). Esdaile and Chalker (2018) have shown that the price of mineral products varies depending on the quality and innovative technology used for producing the finished products.

There are numerous socioeconomic, demographic and political factors that affect growth and development in the mining sector. Dube and Maroun (2017) have shown the numerous benefits of promoting awareness about the benefits of adhering to corporate social responsibility guidelines in South African mining companies. The biggest factors that affect sustained growth in the South African mining sector are high cost of labour, inflexible labour laws, too much bureaucracy, red tape, lack of efficient municipal services, high cost of energy, high cost of transport and heavy equipment, lack of technical skills that are needed for ensuring profitable mining operation, labour unrest, the vertical depth of mines, shortage of technology needed for extracting mines from deep deposits, lack of reliable policy on the mining sector, inability to reduce unemployment and poverty levels among the majority population group, lack of good governance, failure to adhere to regulations and guidelines, lack of leadership, and policy-related uncertainty about the mining sector of the economy. Drew (2019) has found that the arduous task of

addressing environmental pollution that has been caused by mining operations that were carried out in the past several decades is a costly and logistically challenging exercise. South Africa relies on the mining sector for ensuring sustained economic growth and development. The cost of commodities has been decreasing over the past several years. Since the early 1970s, South African mines have become deeper, less profitable and much more dangerous than they were a hundred years ago. As a result, mining operations in South Africa have become less profitable at the moment. According to Bloch, Johnson, Nkosi and Ehrlich (2018), sufficient compliance with corporate social responsibility guidelines and principles in South African junior mining companies ensures the continued survival and prosperity of both local communities and junior mining companies. Carvalho (2017) has identified key indicators of adherence to the basic guidelines and principles of corporate social responsibility in South African junior mining companies.

Objective of study

The overall objective of study was to assess the degree of adherence to the basic guidelines and principles of corporate social responsibility in junior mining companies operating in Mpumalanga Province.

Methods and materials of study

Data was collected from 152 employees of junior mining companies operating in Mpumalanga Province in South Africa. Analysis was done in order to identify key predictors of adherence to the basic principles and guidelines and corporate social responsibility in junior mining companies operating in Mpumalanga Province. The degree of adherence to corporate social responsibility in junior mines was assessed by using a composite index constructed by Ganda (2018). Data was gathered on 39 socioeconomic variables that are known to affect productivity, operational safety and efficiency, environmental safety, occupational health, level of technical skills, the use of appropriate equipment and technology, and general working conditions. Data analysis was performed by using ordered logit analysis (Hosmer and Lemeshow, 2015).

Results of data analyses

Table 1 shows the general socioeconomic characteristics of the 152 respondents who took part in the study.

Table 1: General characteristics of respondents (n=152)

Variable of study	Percentage
Adherence to the basic principles and guidelines of corporate social responsibility	Adequate: 74.34% Not viable: 25.66%
Profitability of business operation	Profitable: 74.17% Not profitable: 25.83%
Type of mining enterprise	Joint venture: 11.67% Partnership: 19.17% Private company: 21.67% Sole ownership: 45.00% Others: 2.50%
Main activity of company	Full value chain: 5.83% Mining: 35.00% Processing: 49.17% Trading: 10.00%

Size of company in millions of Rand	Above 200: 24.17% 151 to 200: 12.50% 101 to 150: 17.50% 81 to 100: 10.83% 80 or less: 35.00%
Number of employees in company	21 or more: 20.83% 16 to 20: 58.33% 9 to 15: 7.50% 8 or less: 13.33%
Viability undermined by failure to secure loan needed for operation	Yes: 45.00% No: 55.00%
Viability undermined due to intense competition from well-established mining enterprises	Yes: 65.83% No: 34.17%
Viability undermined due to low demand for products at the marketplace	Yes: 83.33% No: 16.67%
Viability undermined due to unfair tax	Yes: 67.50% No: 32.50%
Viability undermined due to bureaucratic regulations and red tape	Yes: 67.50% No: 32.50%

It can be seen from Table 1 that 74.34% of the 152 respondents adhered adequately to the basic principles of corporate social responsibility, whereas the remaining 25.66% did not do the same. The table shows that about 74% of respondents worked in profitable junior mining companies.

Table 2 shows percentages for the perceptions held by the 152 respondents of study on the benefits of outsourcing to overall productivity and profitability at their company. The table shows that about 60% of respondents agree that that outsourcing is helpful for improving overall productivity and viability in their mining enterprises. The table also shows that about 82% of respondents believe that using original equipment manufacturers on a contractual basis is beneficial to their companies.

Table 2: Benefits of outsourcing to productivity (n=152)

Variable of study	Percentage
Benefits of outsourcing to overall productivity	Strongly agree: 10.00% Agree: 49.17% Neutral: 16.67% Disagree: 23.33% Strongly disagree: 0.83%

Benefits of using original equipment manufacturers on a contractual basis	More than expected: 11.67% As expected: 70.00% Less than expected: 11.67% No benefit at all: 6.67%
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Table 3 shows percentages for the perceptions held by the 152 respondents of study on the degree to which sales growth and improved market share have been realised in their companies over the past several years. It can be seen from the table that about 93% of respondents believe that their companies have achieved growth in sales in the past several years of operation. The table shows that about 83% of respondents believe that their companies have achieved growth in market share in the past several years of operation. It can be seen from the table that about 65% of respondents believe that their companies have achieved growth in net profit in the past several years of operation. The table shows that about 76% of respondents believe that their companies have achieved growth in liquidity in the past several years of operation. The table shows that about 74% of respondents believe that their companies have achieved improvement in their public image in the past several years of operation.

Table 4: Assessment of sales growth and market share (n=152)

Variable of study	Percentage
Perception on the degree to which sales growth has been realised over the past several years	More than expected: 73.95% As expected: 18.49% Less than expected: 6.72% Poor: 0.84% Very poor: 0.00%
Perception on the degree to which market share has been improved over the past several years	More than expected: 59.17% As expected: 22.50% Less than expected: 0.00% Poor: 17.50% Very poor: 0.83%
Perception on the degree to which net profit has been improved over the past several years	More than expected: 40.83% As expected: 24.17% Less than expected: 0.00% Poor: 25.83% Very poor: 9.17%
Perception on the degree to which liquidity has been improved over the past several years	More than expected: 50.00% As expected: 25.83% Less than expected: 0.00% Poor: 20.00% Very poor: 4.17%
Perception on the degree to which the public image of the company has been improved over the past several years	More than expected: 60.00% As expected: 24.17% Less than expected: 0.00% Poor: 12.50% Very poor: 3.33%

Table 5 shows results obtained from bivariate analysis (Searle & Khuri, 2017). The table shows the top 10 factors that are significantly associated with adherence to the basic principles of corporate social responsibility (CSR) in junior mining companies.

Table 5: Significant associations obtained from cross-tab analyses (n=152)

Factors associated with adherence to CSR principles and guidelines	Observed chi-square value	P-value
Lack of awareness about the potential benefits of corporate social responsibility to junior mining companies	11.4224	0.000***
High cost of operation	10.8148	0.000***
Low market demand for products	9.5226	0.000***
Bureaucracy related to license applications and renewals	8.8114	0.000***
Lack of support from local municipality	7.6564	0.000***
High cost of labour	6.9403	0.000***
High cost of maintenance	5.1516	0.004**
Lack of sales growth	4.3037	0.009**
Intense completion from rivals	3.8818	0.012*
Lack of skills-based training opportunities	3.7174	0.016*

Legend: Significance at * P<0.05; ** P<0.01; *** P<0.001 levels of significance

Table 6 shows estimates obtained from ordered logit analysis. The table shows that adherence to CSR principles was significantly influenced by 3 predictor variables. These 3 predictor variables were lack of awareness about the potential benefits of corporate social responsibility to junior mining companies, high cost of operation, and low market demand for products, in a decreasing order of strength.

Table 6: Predictors of adherence to CSR principles (n=152)

Predictors of adherence to the basic principles of CSR	Odds Ratio	P-value	95% C. I.
Lack of awareness about the potential benefits of corporate social responsibility to junior mining companies	4.51	0.003	(2.23, 7.58)
High cost of operation	2.65	0.009	(1.86, 6.14)

Low market demand for products	2.53	0.015	(1.80, 5.76)
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Discussion of results

The study has led to the identification of key obstacles to adherence to the basic principles and guidelines of corporate social responsibility (CSR) in junior mining companies operating in Mpumalanga Province. Results obtained from ordered logit analysis have shown that adherence to CSR principles and a guideline was significantly influenced by 3 predictor variables. These 3 predictor variables were lack of awareness about the potential benefits of corporate social responsibility to junior mining companies, high cost of operation, and low market demand for products, in a decreasing order of strength.

Recommendations of study

It is in order to make appropriate recommendations to junior mining companies operating in Mpumalanga Province:

- The South African National Department of Mineral Resources (2020) should promote awareness about the potential benefits of adherence to the basic principles and guidelines of corporate social responsibility (CSR) in junior mining companies operating in Mpumalanga Province.
- Junior mining companies should seek skills based training from the South African Small Enterprise Development Agency (SEDA) as a means of improving the degree of specialised skills their employees possess. Doing so enables junior mines to be operationally fit enough to compete adequately at the local and global markets and be financially viable; and
- Junior mining companies should pursue strategic partnerships and collaborations with well-established mining enterprises with a view to have access to local and global markets.

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