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Antecedents of Shared Value: Perceptions within the South African mining industry

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ABSTRACT

Background: Mining has helped to shape South Africa to a greater extent than any other industry and accounts for a significant proportion of the country's gross domestic product (GDP), foreign exchange earnings and employment numbers. Despite mining being recognised as a 'sunset' industry plagued by rising costs, technical difficulties, political hostility and its legacy of diseases and negative environmental impact, South African mining is foundational to the development of all other industries and socio-economic priorities of government and communities. Shared Value (SV) creation is a core business practice that focuses on identifying and expanding the connections between societal and economic progress, including environmental opportunities.

Purpose of the study: The primary objective of this study was to investigate the antecedents of SV within the South African mining industry.

Design/Methodology/Approach: A convenience sample of 340 respondents who are employed as managers within the mining industry completed self-administered questionnaires in order to record their perceptions of SV. The impact of six independent variables or antecedents on shared value was tested.

Results/Findings: From a quantitative analysis, the empirical results showed two statistically significant relationships. The results confirmed that automation and innovation (through innovation for value chain inclusivity, automation and business model innovation, infrastructure development), as well as employment conditions, could be regarded as antecedents of SV in the mining industry.

Managerial implication: Based upon its results, this study contributed to the existing body of related knowledge by providing practical recommendations to policymakers and managers within the mining industry to improve its competitiveness, sustainable performance and economic prosperity by resolving social and environmental issues of mutual interest to communities, government and other key stakeholders.

Keywords

Automation; business model innovation; competitive advantage; employment conditions; inclusive value chain innovation; infrastructure development; innovation; mineral resource governance; shared value.

JEL Classification: O21

1. INTRODUCTION AND PROBLEM STATEMENT

Mining is an important economic industry in over 100 countries globally, with South Africa ranking among the top 50 “mining countries” in the world (Sarupria, *et al*., 2018; Khubana, 2021). In the 1980s, the mining industry, which served as the backbone of the South African economy, was the second-largest contributor to the country's gross domestic product (GDP), contributing 22 percent per year (Statistics SA, 2021). According to the South African Institute of Race Relations (IRR) (2019), by 2016, the composition of GDP had drastically changed with the financial services industry being the largest contributor at 21 percent, followed by government at 17 percent, the trade industry at 15 percent, the manufacturing industry at 13 percent and the transport industry which contributed 10 percent in the fifth position. Consequently, the mining industry obtained sixth place in terms of GDP contribution, with an 8 percent contribution. In an interval of 10 years, the highest GDP contribution by the mining industry was in 2009 (8 percent), while in all the ensuing years it experienced a steady decline to 7 percent attained in 2018. The mineral export sales also declined to 27 percent (R333 billion) in 2018 from 35 percent reported in 2009 (R175 billion), which was the highest level recorded within the previous 10-year period (Mineral Council of South Africa, 2019).

In 1987, the mining industry employed more than 760 000 people and, since then, mining employment has decreased to a low of 400 000 in 2001 and slightly increased again to approximately 530 000 in 2008 (South African Institute of Race Relations, 2019). However, the Mineral Council of South Africa (MCSA) (2018) notes that while the mining industry created approximately 1.4 million jobs in related industries in 2018, direct employment decreased from 491 794 people in 2009 to 463 901 employees in 2018. The growth of secondary and tertiary industries, together with the diminishing mining production level, are amongst factors that caused a decrease in the direct mining contribution to the country's GDP, employment, production and export sales, as well as fixed investments. On a more positive note, the mining industry saw safety improvements in 2019, with 51 people tragically losing their lives in mining-related accidents, compared to 82 deaths in 2018, which eclipsed the 73 deaths recorded in 2016, (Mineral Council of South Africa, 2020).

Mining in South Africa is a foundational industry because of its uniqueness and capacity to produce basic materials or commodities necessary for development to the value/supply chains of strategic manufacturing, engineering, energy, technology, transport, construction and other industries (PricewaterhouseCoopers (PwC), 2019), while also supporting socio-economic priorities of government and communities (IRR, 2019). However, the true socio-economic contribution of mines is being questioned (Deloitte, 2019), from the premise that mining has frequently resulted in significant adverse environmental and social impacts that have not been fully recognised or addressed. Although the industry has approximately R630 billion worth of production capacity, this achievement is not matched by its socioeconomic impact (MCSA, 2018).

According to Lane *et al*. (2015), lower commodity prices, fluctuating export demand, escalating operational costs, policy uncertainty, labour unrest, ageing mines, and infrastructure challenges are the major factors undermining the growth of the South African economy and its mining industry's competitiveness. Although South Africa's total mining reserves remain some of the world's most valuable, with an estimated worth of R20.3-trillion ($2.5 trillion), the mining industry is also faced with a combination of policy instability, persistent fears about nationalisation and labour militancy (Brand South Africa, 2012). After 20 years of democracy, the country is still trying to transform the economy and ensure a fair and sustainable distribution of wealth among South Africans through the 2003 Broad-Based Black Economic Empowerment (BBBEE) Scorecard, the National Development Plan (2012) and the 2018 Mining Charter. The uncertainties arising from

political policies and economic instability further prevent the industry from creating long-term value for all stakeholders (The Federation for Sustainable Environment, 2018). There is thus a gap in terms of principles and strategies that mining organisations in South Africa can implement to ensure positive economic, social and environmental outcomes.

Many organisations attempt to incorporate sustainability into existing business theories, models, strategies and practices, such as Corporate Social Responsibility (CSR) and Triple Bottom Line (TBL), through ensuring their employees adhere to these stipulations. However, many organisations have not succeeded in overcoming ongoing societal problems and evolving forms of environmental issues, such as climate change, acidification and other forms of anthropocene (the current geological age, viewed as the period during which human activity has been the dominant influence on climate and the environment) (Low, 2016). Hence, it is evident that the mining industry is facing many challenges and, therefore, Shared Value (SV) is required to systematically change business models, strategies and practices. The mining organisations' new business sustainability and competitive strategy could then be based on addressing socio-economic and environmental issues, thereby enabling organisations to establish sustainable value for all stakeholders. Thus, Porter and Kramer (2011) explain SV as implementing organisational policies and practices that establish and sustain the competitive edge of an organisation over its industry rivals and new entrants to the market, by simultaneously advancing social and economic conditions in the communities in which it operates. An organisation's success, thus, is linked to social progress.

Porter and Kramer (2011) posit that the SV framework enables organisations to generate profit from the societal engagements that create a win-win situation for organisations and communities. The key benefits of implementing SV include improved brand value and the creation of competitive advantage for organisations through encouraging more innovative solutions to traditional business and social challenges or creating access to new markets. In addition, other benefits gained from the implementation of SV comprise long-term sustainability, enabling organisations to survive and thrive in a changing business climate by improving the social conditions and helping to conserve the environment. Similarly, Kramer and Pfizer (2016) assert that organisations that focus on SV gain the 'Social Licence to Operate' from communities that are often disenfranchised. However, in South Africa there is a research gap in terms of this

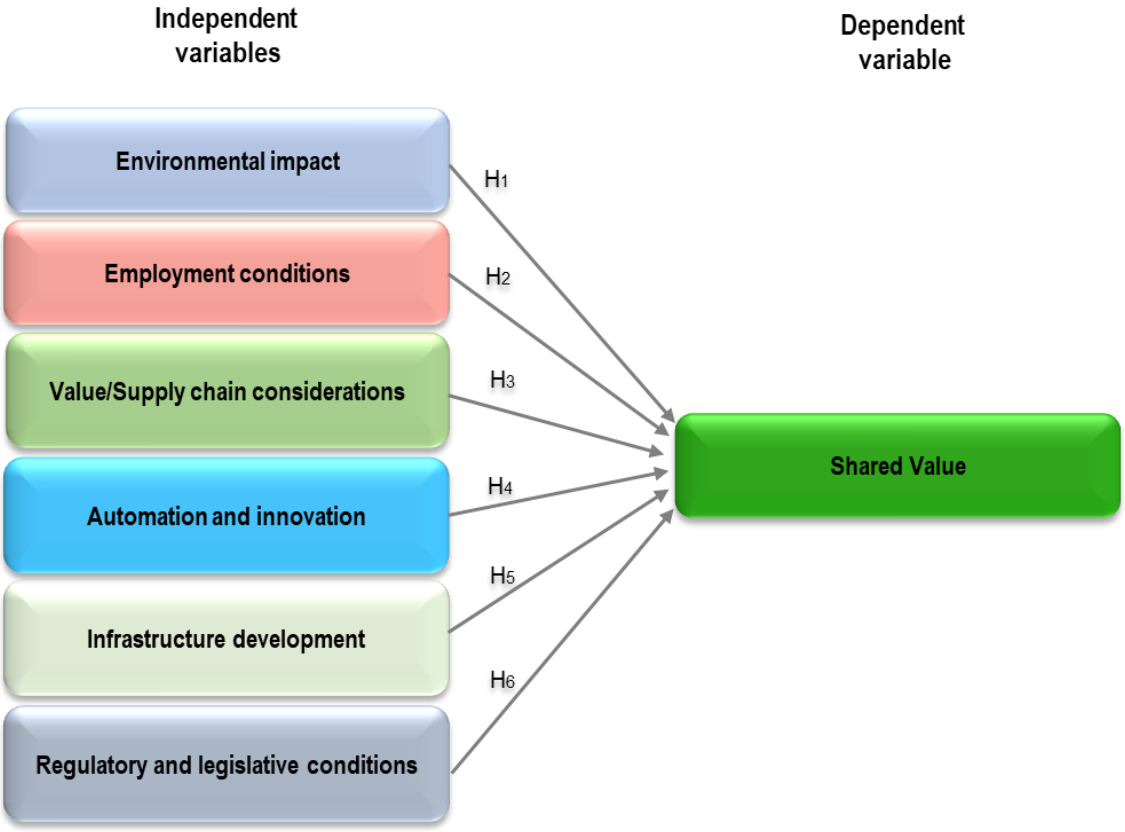
concept since SV within the mining industry, together with its antecedents for implementation and possible benefits, have yet to be researched (Cooper & Harvey, 2018).

Despite South Africa's ever-increasing importance in the global economy, especially in the mining industry, there are limited studies conducted within the South African mining industry, specifically regarding SV. The reason why the mining industry was considered in this study is two-fold, as has been delineated in the discussions above. Firstly, the mining industry is a foundational industry contributing extensively to South Africa's economy through its GDP contribution and employment numbers, therefore research that can possibly contribute to the mining industry's success is critical; secondly, mining organisations' social and environmental impact has often been questioned, which makes this study concerning SV relevant to the mining industry (Plagerson & Stuart, 2018; Goodman *et al.*, 2019; American, 2021). Against this SV literature gap, specifically in the South African mining industry, this study's research problem was addressed by considering the following main research question: *What are the perceptions and antecedents of SV within the South African mining industry?* The primary objective of this study was to investigate perceptions of SV within the South African mining industry to determine the antecedents of SV in the industry. Identifying the relationships between selected antecedents and SV creates opportunities to implement and ensure SV. In turn, this practice could ultimately lead to South African mining organisations achieving positive outcomes, such as increasing their economic prosperity by resolving socio-economic and environmental issues of mutual interest to communities, government and other key stakeholders.

2. LITERATURE OVERVIEW

The SV concept, the CSR theory and the TBL theory, as well as the sustainability model, all posit that organisations should consider the environmental, social and economic impact of their business activities in order to achieve long-lasting success (Porter & Kramer, 2011; Christiansen, 2014; Network for Business Sustainability, 2016). This study draws from the SV and related theories and specifically investigates a hypothesised model that SV is possibly influenced by six independent variables, namely environmental impact, employment conditions, value/supply chain considerations, automation and innovation, infrastructure development and regulatory and legislative conditions (see Figure 1).

Figure 1: Hypothesised model of the antecedents of shared value within the South African mining industry



Source: Researchers' own construct.

2.1 Shared Value conceptualisation

The SV concept was developed in 2006 by Porter as a solution to market failure and the inability of CSR and philanthropy to address social and environmental issues following extensive CSR research (Khubana, 2021), and since then it has developed until an article entitled SV was published by Porter and Kramer in the Harvard Business Review in 2011. Porter and Kramer (2011) argue that SV is not about sharing the value that has already been created; but rather, it is about expanding the pool of economic and social value. SV is more meaningful in underdeveloped countries (particularly within the African context), that are faced with deep societal challenges that organisations can solve whilst creating economic value.

The difference between CSR and SV is that CSR is concerned with sharing the wealth created by organisations, whereas SV is concerned with wealth maximisation, whilst also maximising the benefits for the environment and society. The fundamental distinction between these two entities is that CSR is usually external and, thus, separate from the organisation's economic focus, while SV integrates social and environmental impact into the organisation's competitive strategy, and goes beyond legal requirements (Deans *et al.*, 2018). Porter and Kramer (2011) conceptualise the implementation of SV as the ability to address societal issues as integral to profit maximisation, instead of it being treated outside the profit model, by embracing equal or greater opportunities arising from serving disadvantaged communities and developing countries. SV creates economic and societal benefits relative to cost and it is based on an organisation-specific agenda that is integral to competing, essentially for profit maximisation (Porter & Kramer, 2011). Therefore, CSR is about responsibility (reactive); SV is about creating value (proactive).

It is evident that no absolute or universal definition of SV exists, since it is a relatively new strategy (Kvistgaard, 2013). However, Porter and Kramer (2011:6) explain SV as *"policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates; value is defined as benefits relative to costs, not just benefits alone".* This study defines SV as a practice of developing and implementing innovative strategies and business models that address social issues while, in turn, creating reciprocal financial and societal benefits for interdependent stakeholders, including the environment. CSR is often regarded as the opposite of capitalism, whereas SV is considered as a higher form of capitalism (Porter & Kramer, 2006).

Porter and Kramer (2011) indicate three ways of creating SV, namely reconceiving products and markets, redefining productivity in the value chain and ensuring local cluster development. Reconceiving products and markets can be explained as defining markets in terms of unmet needs or social ills and developing profitable products and services that remedy these conditions. Redefining productivity in the value chain is on the other hand explained as increasing the productivity of the organisation or its suppliers by addressing social and environmental constraints in the value chain. Finally, ensuring local cluster development can be explained as strengthening the competitive context in key regions where the organisation operates in ways that stimulate growth and higher productivity.

According to Wachira *et al.* (2020) as well as Breidbach and Maglio (2016), organisations achieve greater SV as a competitive strategy, when they focus on proactively responding to environmental impact, refining employment conditions, improving the value/supply chain, automating and innovating process and business models, developing enabling infrastructure, and operating beyond mere compliance with government regulatory and legislative policies.

2.2 Environmental impact

Environmental impact as a variable affecting SV refers to the interventions that an organisation can implement to mitigate its negative impact on natural resources in a way that creates benefits for communities and the organisation, including engaging in the economic use of natural resources, environmentally friendly packaging, pollution control and nature conservation, recycling and waste reduction, renewable energy and water preservation. The creation of SV, according to the European Union (2011), requires organisations and their stakeholders and society as a whole to recognise, avoid and minimise their future adverse environmental effects. The most critical aspects of environmental impact management include the use of resources, water and energy consumption, the treatment of emissions and the disposal of waste (pollution) in the most sustainable and eco-friendly way feasible (European Commission, 2015), such that these practices create benefits for communities and organisations (Edgeman & Eskildsen, 2014).

Gittleson (2012) argues that a focus on solving environmental problems can lead to competitive advantage, adaptive innovation and the advancement of stakeholders' interests. In the mining industry, to reduce the adverse effects of carbon emission caused by coal-fired power generation, Rio Tinto (2018) has invested in clean energy technologies, such as solar and wind power, resulting in significant savings in energy costs and increased energy supply reliability, while reducing carbon emissions by over 65 percent. Therefore, organisations that integrate the environmental impact of their operations into organisational strategies and operational processes can benefit from the new economic opportunities (Polášek, 2010). The value of an investment is no longer just about economic returns, instead, the value created by the organisation is measured by environmental, social and governance practices. An increasing number of investors are also calling for their money to make a positive impact on society and the world at large. Based on this debate, the following idea is hypothesised:

H_1: There is a significant relationship between *environmental impact* and *SV*.

2.3 Employment conditions

Employment conditions can be defined as those aspects in a person's working environment that influence life and work, which include the following dimensions: types of contracts, remuneration and benefits, safety and health at work, equity and diversity, professional development, and how tasks are allocated as well as staffing in general. Nilsen and Ringholm (2019) aligned with Mustafa and Ali (2019) define employment conditions as philosophies and operating practices that align the expectations and beliefs of employees with those of the employer.

According to Kang and Na (2020), by adopting human resources policies that are 'family-friendly' and SV inclined, organisations increase their ability to attract and retain employees, create employment and economic opportunities for local communities, improve workforce mobility and build the core competence that is integral to establishing their competitive internal capabilities in a manner which is different from rivals' activities, yet creating value for key stakeholders. Therefore, mining organisations that focus on improving employment conditions and implementing SV employment policies contribute to community development, thereby, reducing unemployment, which, in turn, will reduce poverty and illiteracy levels, and improve the standard of living (Porter *et al*., 2012). This study's second hypothesis, based on the above discussion, is presented:

H_2: There is a significant relationship between e*mployment conditions* and SV.

2.4 Value/supply chain considerations

In this study, supply/value chain considerations refer to the recognition of social or economic gaps within the value-creating network of activities, which, when reconfigured innovatively, contribute to sustainable development gains for communities. Kang and Na (2020) define value chain as a management tool used to analyse the internal workings of the organisations by disaggregating their value-generating practices which, amongst others, comprise human resources, information technology and procurement.

SV can be accomplished by transforming the following dimensions of the value chain (Porter & Kramer, 2011): energy use and storage, resource usage, procurement, distribution, employee efficiency and location. In addition, SV approaches are centred on reconceiving goods and markets and reimagining competitiveness in the value chain, while enabling local community

development. These approaches can also be argued to be self-reinforcing. Rio Tinto in Canada successfully invested in capacity building for local communities and suppliers, in collaboration with educational institutions and government, to create a pool of prospective employees and suppliers, eventually recruiting 62 percent of these employees and suppliers, as well as procuring 71 percent of goods locally, further reducing logistical expenditure (Porter, 2014) and improving efficiency. Therefore, SV organisations innovate their supply chain for inclusivity by reducing their supply costs, using environmentally sustainable transport, relying on sustainable energy, turning their mine dumps into economic uses, improving the productivity of employees and promoting local suppliers through local procurement and suppliers' empowerment programmes (Wachira *et al.*, 2020). The third hypothesis is presented, based on the above discussion:

H3: There is a significant relationship between *value/supply chain considerations* and SV.

2.5 Automation and innovation

Automation is described as the intelligent control of systems using suitable technologies to function without human input, while innovation is defined as the development of new solutions that address unmet needs which create a lasting impact (Ralston *et al*., 2017). Automation and innovation have a wide range of dimensions, including business model innovation, research and development, digitisation (technological modernisation/artificial intelligence) and product redesign (Amit & Zott, 2012; Schwab, 2017; Hoerlsberger, 2019). Innovation presents an opportunity for reimagining new economies, markets and/or business and social innovative solutions that create value for all stakeholders (Brent & Felder, 2014; Rampersad, 2015).

According to Jolink and Niesten (2015), automation and innovation should be not viewed as incidental to sustainability or the creation of SV, instead, these actions should be recognised as necessities irrespective of the level of disruption possibly caused. In the mining industry, organisations improve the way mines operate, focusing on increasing productivity, safety and health, capability and reliability through the adoption of innovative technology and automation of certain functions (MCSA, 2019). Pfitzer *et al*. (2013) and Wachira *et al*. (2020) state that mining organisations could create SV by redesigning new products and markets, which may include the supply of energy and water over and above the traditional products of mining (minerals). Based on the above discussions, the fourth hypothesis is developed:

H4: There is a significant relationship between *automation and innovation* and SV.

2.6 Infrastructure development

Infrastructure development refers to the quality, quantity and accessibility to various facilities, such as water and energy supply, transport (road and rail network) and any other facilities that stimulate socio-economic development and welfare infrastructure. The consensus amongst researchers is that infrastructure investment is a primary driver of development and equity which alleviates poverty, both of which are indicators of economic growth and social mobility (Calderón, & Servén, 2010; IMF, 2014; World Bank, 2018).

According to Saghir (2017), "*sustainable infrastructure enhances the quality of life for citizens, helps protect vital natural resources and environment, and promotes more effective and efficient use of financial resources*". Furthermore, governments in developing countries, South Africa included struggle to reduce the burden of pressure to build infrastructure which is capable of stimulating community development and economic growth (Szablowski, 2007). As a result, there are growing expectations for organisations to contribute to the development of enabling infrastructure. In line with this thinking, the Mineral Council of South Africa (2018) states that the development of rail infrastructure and improvement of the energy infrastructure would increase the competitiveness of organisations. Information technology in Silicon Valley, diamond cutting in Surat, India and Kista, Stockholm Science Parks are some of the known cases (Moon *et al*., 2011) in which SV was created based on the principles of infrastructure development. Kleemann and Krieger-Boden (2011) assert that infrastructure development presents a vital opportunity for an organisation to ensure both its long-term performance and to gain the community's approval of its operations by repairing or providing infrastructure essential for social mobility and productivity of the organisation. The above discussion leads to the fifth hypothesis:

H5: There is a significant relationship between *infrastructure development* and SV.

2.7 Regulatory and legislative conditions

Regulatory and legislative conditions refer to regulatory and legislative interventions put in place by the government to promote economic progress and social prosperity for all stakeholders (Moczadlo, 2015; PwC, 2017). The subject of regulatory and legislative conditions is broad and, as a result, this study refers to the regulatory and legislative conditions relevant to government interventions aimed at creating effective governance of mineral resources. Amongst others, these

mediations include government policies (Acts), standardisation through the Mining Charter and other instruments of accountability and transparency applicable to mining.

The varied expectations of stakeholders on the role of organisations and government concerning social and environmental issues have heightened the debate about SV (Font *et al.*, 2016). As a result of these concerns, policymakers should develop guidelines that redefine the priorities of the organisations by incorporating societal and environmental issues into their competitive strategies (Porter & Kramer, 2011; Dufwa & Meconnen, 2016). Mining organisations received grants for providing renewable energy to the government grid in Canada and received tax credits in Papua New Guinea (Columbia Center on Sustainable Investment, 2018), these initiatives also significantly reduced CO2 emission while, at the same time, improving the lives of the communities in the surrounding areas, thus creating SV. This discussion led to the development of the sixth hypothesis:

H6: There is a significant relationship between *regulatory and legislative conditions* (*mineral resource governance*) and SV.

3. RESEARCH METHODOLOGY

The research design and methodology of the study is discussed through the use of the 'research onion' as described by Saunders *et al.* (2019). Given the nature of the study, it is important to identify the perceptions and antecedents (relationships) of SV, therefore, a positivistic research philosophy was deemed most appropriate and, hence, adopted. The deductive approach to theory development was relevant in the context of this study (Egan, 2002), since the data collected from the study was used to identify and test variables linked to SV theory and existing literature in the South African mining context. For the purpose of this study, a mono-method quantitative methodological choice was adopted to describe patterns, trends and relationships in numerical data (Lochmiller & Lester, 2017). This approach is deemed appropriate since data was collected from large samples to quantitatively (statistically) test hypotheses (Struwig & Stead, 2013; Creswell, 2014; Kivunja & Kuyini 2017; Greener & Martelli, 2020). A survey strategy was adopted in this study to identify people's perceptions. A cross-sectional time horizon (a single point in time) study was conducted (Babbie & Mouton, 2012) since the objective was not to monitor change over a period of time, but rather to collect data from respondents regarding their SV perceptions at a specified time, to identify current views on SV antecedents.

In addition to secondary data collection for the literature review, primary data collection for the empirical investigation occurred as follows. The target population comprised managers of mining organisations affiliated with the Mineral Council of South Africa. However, as no sampling frame was available and, due to geographic location, the sample was confined to mining organisations with operations in Gauteng, Limpopo, Mpumalanga and North West provinces. To be cost and time efficient, the non-probability convenience sampling technique was used (Struwig & Stead, 2013). Respondents were approached electronically through the respective gatekeepers of the selected mining organisations. Prior to the circulation of the survey, institutional ethics clearance was obtained. In addition, written consent to approach managers of various mining organisations was obtained from CEOs or delegated officials of the targeted organisations. Potential respondents were informed about the study's purpose before completing the questionnaire. The study was voluntary, anonymous, all data treated confidentially, and respondents could withdraw at any stage without penalty.

The structured questionnaire was self-developed by the researcher; however, items were constructed based on the literature review conducted. Section A of the self-administered questionnaire, using nominal scales, gathered data relating to the respondents' biographic and demographic status, such as their gender, age, population group, tenure within the industry, size and type of the organisations in which they were employed, as well as the organisational activities. Section B comprised 30 items using an ordinal scale relating to the study's independent variables in the form of a seven-point Likert-type scale ranging from 'strongly disagree' (1) to 'strongly agree' (7). Similarly, Section C comprised 15 items measuring the dependent variable.

The face validity of the questionnaire was ensured, because academic experts in business management were approached to examine and assess the questionnaire prior to its dissemination to the study participants. To ensure content validity, a pilot study was conducted among 20 potential respondents to pre-test the measuring instrument, and no changes were made because these respondents understood the questionnaire items.

The computer programs Microsoft Excel and Statistica were used for data analysis. Descriptive statistics were conducted to summarise the data such as through calculating means, frequencies and standard deviations. In addition, various inferential statistics were conducted in four data analysis steps. Firstly, Exploratory Factor Analyses (EFAs) were performed to measure the

questionnaire's construct validity, because the items were mostly self-developed. Items with EFA factor loadings of at least 0.4 were considered valid (Hair *et al.*, 2014). The study used Cronbach's alpha correlation coefficients to assess the reliability of the questionnaire, with 0.7 coefficients regarded as reliable (Hair *et al*., 2014). To consider the possible correlations and statistically significant relationships between variables, Pearson's product-moment correlation coefficients were calculated, and a multiple regression analysis conducted. Pearson's correlations identified whether links exist between the variables (Lind *et al.*, 2012). The degree of association can vary between +1.0 (showing a maximum positive correlation) and -1.0 (showing a maximum negative correlation). For the purpose of this study, Pearson correlations of 0.7 and above were regarded as showing strong associations. The multiple regression analysis determined whether significant relationships exist between the independent and dependent variables (Hair *et al*., 2014), thus these results were used to accept or reject the hypotheses. During the multiple regression analysis, the beta weights and p-values were considered in order to indicate whether significant relationships exist.

4. EMPIRICAL RESULTS

4.1 Sample description

A total of 600 questionnaires were distributed of which 340 were usable for analysis. This figure reflects a response rate of nearly 57 percent. Most of the respondents were male (60%) and aged between 30 and 39 years (40%). Furthermore, most of the respondents (62%) held postgraduate qualifications, while 36 percent held Bachelor/Diploma/Higher Certificate qualifications and 3 percent senior certificates.

The majority of respondents were from the Black population group (68%), followed by the White population group at 23 percent. Overall, the respondents were directors/owners (4%), executive/top managers (19%), middle managers (50%) and lower-level managers/supervisors (27%) who came from mining organisations with main commodities − coal (20%), base minerals (18%), platinum (18%), gold (15%) and diamonds (12%).

4.2 Validity and reliability results

In this study, two EFAs were performed to assess the validity of the scales measuring the independent and dependent variables and to reduce the large number of variables to smaller

subsets to establish construct validity. Principal Component analysis was conducted through Varimax rotation of the factors during the exploratory factor analysis.

The results of the EFA on the six independent variables (*environmental impact, employment conditions, value/supply chain considerations, automation and innovation, infrastructure development* and *regulatory and legislative conditions*) revealed that three independent variables should be retained, namely, *automation and innovation, mineral resource governance* and *employment conditions*. In terms of the EFA results (see Annexure 1), 30 items were developed to measure six independent variables loaded onto three distinct factors.

Automation and innovation were proposed as an independent variable of the hypothesised model in this study. The first EFA confirmed that 17 items designed to measure automation and business model innovation, value/supply chain considerations and infrastructure development loaded together into a single distinct factor and, based on the content of the items that loaded, this factor was termed *automation and innovation*. Factor loadings ranging between 0.539 and 0.750 showed sufficient evidence of construct validity. Based on the EFA results, *automation and innovation* refers to the development of technological ingenuity, new business models, innovative value chain inclusivity and development of infrastructure that enable organisations to redesign the processes and products to competitively meet the requirements of stakeholders with sustainable solutions. The Cronbach's alpha coefficient for *automation and innovation* was 0.97, and this confirms the reliability of the factor.

Six items loaded onto the second factor of the independent variable EFA. Two items originally developed to measure the construct of environmental impact (and related to mineral resource and environmental legislation linked to regulatory and legislative conditions), one item related to employment legislation and one item aligned to supply chain transformation regulations (BBBEE/ Mineral Charter) under legislative conditions. Finally, two of the five items originally designed to measure regulatory and legislative conditions loaded onto this factor. Since these six items focussed on regulatory and legislative environment, this factor, therefore, was revised to *mineral resource governance*. The factor loadings ranged from 0.442 to 0.656 and the *mineral resource governance*'s Cronbach's alpha coefficient was 0.87, confirming the reliability and validity of the constructs respectively. Based on the EFA results, *mineral resource governance* refers to the mechanism that guides decision-making, instils the culture of shared responsibility and

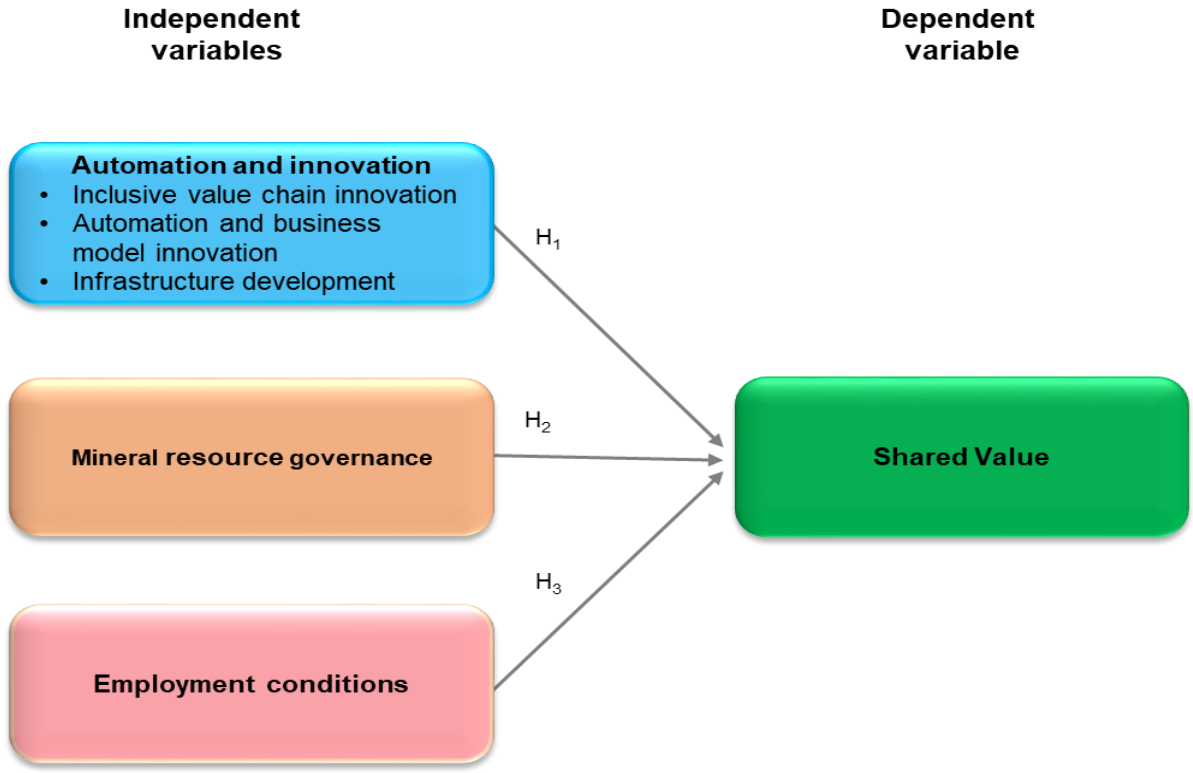
accountability for control and use of natural resources in a sustainable and mutually beneficial way for all stakeholders.

The third factor that resulted in this EFA consisted of seven items measuring *employment conditions*. The items that loaded on *employment conditions* related to training and development of employees, health and safety, job security, disposal of water waste and mineral waste that posed risks of environmental degradation, as well as health and safety of mine employees, sustainable prospecting and exploration programmes that ensure the commercial viability of the mines, investment in community development projects and payment of royalties to stakeholders, including the ownership of the shares. The factor loadings ranged from 0.483 to 0.691 (confirming construct validity) and *employment conditions'* Cronbach's alpha coefficient was 0.85, confirming the reliability of the construct.

SV was proposed as the dependent variable of the hypothesised model in this study. The second EFA confirmed that all 15 items designed to measure *Shared Value* loaded together as intended and explained a proportion of 62 percent of the total variance in the data. Factor loadings ranging between 0.683 and 0.865 showed sufficient evidence of construct validity. As a result, the operationalisation of *Shared Value* remained unchanged. For this study, SV refers to the ways with which an organisation can create social and economic value by integrating socio-economic and environmental issues into their competitive strategies and or core business, by means of reconceiving the new product/market, redefining productivity within the organisation and/or enabling local cluster development. The Cronbach's alpha coefficient for *Shared Value* was 0.96, and this confirms the reliability of the factor.

Based on the results from the EFA and Cronbach's alpha coefficients, the validity and reliability of all three independent variables *(automation and innovation, mineral resource governance* and *employment conditions*) and SV (dependent variable) were confirmed. The measuring instrument, thus, was regarded as valid and reliable. Based on the EFA results, the revised hypothesised model is presented in Figure 2.

Figure 2: Revised hypothesised model of the antecedents of Shared Value within the South African mining industry



Source: Researchers' own construct.

As evidenced in Figure 2 above, the revised hypotheses are:

H1: There is a significant relationship between *automation and innovation* and SV.

H2: There is a significant relationship between *mineral resource governance* and SV.

H3: There is a significant relationship between *employment conditions* and SV.

4.3 Descriptive statistics

The descriptive statistics of the variables were measured using a seven-point Likert-type scale and are summarised in Table 1.

Table 1: Descriptive statistics of the study variables

VARIABLES	MEANS	STANDARD DEVIATION
Automation and innovation	4.23	1.58
Mineral resource governance	4.96	1.43
Employment conditions	5.49	1.04
Shared value (SV)	4.53	1.39

Source: Researchers' own construction, based on the descriptive statistical analyses.

The mean scores for all the factors, as presented in Table 1, indicate that the respondents agree with the statements relating to all the factors (means ranged between 4.23 for *automation and innovation* and 5.49 for *employment conditions*). These results showed respondents to be somewhat more agreeable towards statements regarding *mineral resource governance* and *employment conditions* than to those relating to *automation and innovation* to which they are neutral. The small standard deviations for the factors confirm the existence of slight variation between the responses.

Automation and innovation within South Africa's mining industry had a mean score of 4.23 (neutral). This result implies that managers are neutral regarding the existence of *automation and innovation* within the mining industry. *Mineral resource governance* had a mean of 4.96 (agree somewhat). This means that managers agree somewhat on the existence of *mineral resource governance* within the mining industry of South Africa. In addition, *employment conditions* had the highest mean of 5.49 amongst the independent variables. These results showed that managers of mining organisations are somewhat agreeable (and most when compared to views on the other independent variables) on the importance of conducive *employment conditions* within the mining industry of South Africa. The 4.53 (neutral) mean for SV shows that mining organisations are not yet fully focused on SV as an organisational strategy.

4.4 Inferential statistics

Inferential statistics infer the probable patterns governing the data and generate conclusions that reach beyond the observable data set (Kern, 2012). Hence, in this study, correlations and multiple regressions were used to accept or reject the proposed hypotheses.

4.4.1 Correlation analysis results

This study's data analysis of the relationship results between the variables was explored through Pearson's Product-Moment correlations (Cristobal *et al.*, 2007). In this study, variables with coefficient values above 0.70 (as a cut-off point) were considered to denote the existence of strong relationships, while multiple regression (statistical significance), set at a cut-off value at the 95 percent confidence interval level ($p \leq 0.005$), was taken to indicate significant relationships. Table 2 shows that the correlations between all the variables are positive.

Table 2: Correlation analysis matrix

VARIABLES	AI	MG	EC	SV
Automation and innovation (AI)	1			
Mineral resource governance (MG)	0.879**	1		
Employment conditions (EC)	0.727**	0.742**	1	
Shared value (SV)	0.865**	0.785**	0.743**	1
** Correlation is significant at the 0.01 level (2-tailed).				

Source: Researchers' own construction, based on the Pearson's Product-Moment correlations' statistical results.

Table 2 shows that all independent variables, namely *automation and innovation*, *mineral resource governance* and *employment conditions* are positively correlated to SV, with correlation coefficient scores above 0.70. The Pearson's correlation results indicated that the strongest positive relationship exists between *automation and innovation* and SV (0.865).

4.4.2 Multiple regression analysis results

Sarstedt and Mooi (2014) define regression analysis as a statistical technique that is used to determine the relationship between two or more variables, by showing how the variation in one variable co-occurs with the variation in another.

In this study, multiple regression analysis was executed to assess whether the identified independent variables exerted a significant influence on SV (dependent variable) in the mining industry. According to the multiple regression results, *automation and innovation* ($b = 0.606$, $p < 0.001$) positively and statistically significantly relate to SV in the mining industry of South Africa,

with a regression b-value of 0.606 and a p-value that is <0.001. This result suggests that the availability of and access to reliable and affordable, enabling infrastructure, automation/ technological innovation, as well as the adoption of innovative business models effectively enhances the creation of SV in the mining industry.

Mineral resource governance (b = -0.007, t = -0.120, p = 0.905) has a negative regression on the successful operationalisation of SV in the mining industry and shows an insignificant correlation coefficient of 0.784. This result implies that *mineral resource governance* possibly negatively influences the creation of SV in the mining industry. Although SV depends on *mineral resource governance*, an inverse correlation between *mineral resource governance* and SV is inherent because over-regulation tends to have unintended adverse results (Stevens, 2014; Hayes & Cloete, 2019).

In addition, *employment conditions* (b = 0.321, p < 0.001) statistically exert a significant positive influence on SV in the mining industry of South Africa. This fact implies that the respondents believed that *employment conditions* positively influence mining organisations' SV strategies. The more socially inclined and family-friendly policies and practices mining organisations adopt to improve *employment conditions*, the more SV is developed.

Based on the results of inferential statistics, Hypothesis $_{H1}$ and Hypothesis $_{H3}$ are accepted (p < 0.0001), because *automation and innovation* and *employment conditions* in the mining industry of South Africa have significantly positive influences on SV. Hypothesis H_2 is rejected (p > 0.05), because *mineral resource governance* in the mining industry of South Africa has an insignificant (negative) influence on SV. The study empirically revealed that although both the need for and importance of *mineral resource governance* are widely recognised within the mining industry, too much government intervention in the form of regulations and legislation can negatively affect the effort of creating SV.

5. MANAGERIAL IMPLICATIONS

In view of the lack of existing literature and empirical evidence relating to SV, and the gap of minimal relevant studies in the South African mining industry, this study sought to investigate perceptions of SV within the South African mining industry to determine the antecedents of SV in

the industry. The empirical results demonstrated that *automation and innovation* as well as *employment conditions* are the antecedents of SV in the South African mining industry.

5.1 Recommendations regarding antecedents to improve shared value strategies in the South African mining industry

Based on the empirical results of this study, various recommendations can be presented to organisations in the mining industry of South Africa regarding the antecedents of SV (variables and sub-elements thereof) that have a significant influence on SV. Table 3 provides a summary of recommendations relating to these antecedents.

Table 3: Recommendations regarding antecedents of SV

ANTECEDENTS OF SHARED VALUE							
AUTOMATION AND INNOVATION						REF	EMPLOYMENT CONDITIONS
REF	INCLUSIVE VALUE CHAIN INNOVATION	REF	AUTOMATION AND BUSINESS MODEL INNOVATION	REF	INFRASTRUCTURE DEVELOPMENT		
EC1	Promote inclusive value chain development through stakeholder engagement	AI3	Integrate technology and human resource modernisation plans	ID2	Ensure collaborative infrastructure development through Public-Private Partnerships:	ID4	Adopt a socially-focused employment strategy – SV Employment Plan
VC2	Integrate the Mining Charter and BEE transformation strategies with Supply Chain Management Policy	AI2	Prioritise research and development		*-Build-Operate-Transfer (BOT)*	EC2	Integrate sustainability planning in training and development
VC4	Adopt an asset-based conceptual model for community capacity building programme - technical, business and financial services support	AI2	Collaborate to influence curricula, learning and teaching to build a future-ready generation of employees		*-Build-Transfer-Operate (BTO)*	EC5	Strategically collaborate with employees and trade unions to nurture employee engagement and involvement
VC4	Innovate through collaborations for joint learning and continuous improvement	AI5	Accelerate the establishment of a Mining Centre of Excellence (HUB)		*-Community-Driven Development (CDD) Partnership.*	RL5	Adopt the shared productive ownership structure
VC3	Adopt a smart multimodal transport solution and shared use transport infrastructure model	AI1/4/5	Adopt a new digitally-enabled business model – 'Intelligent Digital Mines'		*-Concession PPP*	RL5	Collaborate for the establishment of a centralised royalty system/agency

		EI2/ EI4/ EI5	Pursue new business opportunities in energy, water, technology and waste management	ID3	Ensure collaborative infrastructure development through shared infrastructure initiatives	EC3	Implement innovative performance management and reward systems
				ID1	Invest in sustainable community development projects	EC5	Instil a positive culture and working environment
			-Independent Power Production (IPP), renewable energy and water reclamation		Catalyse the development of the Special Economic Zones		
			-Alternative minerals	ID5	Catalyse the development of the Special Economic Zones	VC1/ EC3/ EC5	Implement sustainable prospecting and exploration projects
			-Technological equipment			EI5	Develop the policy for innovative mine waste reduction and valorisation
		AI4	Diversify investments through mineral beneficiation and industrialisation				

Source: Researchers' own construction

Flynn *et al.* (2018) maintain that South African organisations should identify SV creating opportunities and prioritise initiatives that will maximise value for all stakeholders. The recommendations shown in Table 3 provide various strategies available to mining organisations to implement SV by focussing on *automation and innovation* as well as *employment conditions* as the antecedents of SV in the South African mining industry.

5.1.1 Strategies linked to automation and innovation

The empirical results of this study indicated previously confirmed that *automation and innovation* is an antecedent of SV within the mining industry of South Africa. The World Bank (2018) and the World Economic Forum (2017) also concur that mining is an industry driven by value chain

innovation, automation/technology innovation and infrastructure development (all part of *automation and innovation*).

Firstly, in order to create SV, through *automation and innovation*, organisations are required to focus their efforts on intensifying inclusive value chain innovation. Adopting a SV strategic approach involves change, institutionalising a business model that embeds a new set of values and involves cultural transformation. The proposed inclusive value chain innovation should entail six dimensions, namely, market, social innovation, entrepreneurship, new business model, social network support and social performance. Therefore, since the conventional business model is not generating enough value to contribute to societal good, mining organisations should adopt inclusive value chain innovation so that over the long-term organisations will achieve economic success without sacrificing the progress of society. The adoption of inclusive value chain innovation amongst other processes includes the following strategies: integrating the Mining Charter and BEE transformation strategies with Supply Chain Management Policy, implementing an asset-based conceptual model for community capacity building programme which is underpinned by technical, business and financial services support, promoting innovation through collaborations for joint learning and continuous improvement and instigating a smart multimodal transport solution and shared-use transport infrastructure model.

The second approach to the creation of SV includes automation of the processes and business model innovation. Automation and business model innovation, as a strategy linked to creation of SV, requires that mining organisations prioritise research and development, influencing curricula (and thus learning and teaching) to build a 'future-ready' generation of employees, and establishing a Mining Centre of Excellence to accelerate innovation. Adopting a new digitally-enabled business model (Intelligent Digital Mines) and mineral beneficiation also present unique opportunities for the creation of SV, which include the creation of new markets, development of a new/industrial economy and the creation of employment opportunities. This study revealed that innovation offers numerous opportunities to South African mining organisations to revolutionise their revenue-generating strategies and operational requirements. Some of the new business opportunities that mining organisations can pursue include energy supply (Independent Power Production (IPP) and renewable energy), water reclamation, alternative minerals identified from the use of technology, technological equipment and waste management solutions. The transition from coal dominated electricity supply to renewable energy (one based on solar and wind as well

as hydrogen) signals a new frontier of the industrial economy, particularly when the manufacture of renewable energy equipment and infrastructure development is localised.

Thirdly, by targeting infrastructure development investment opportunities that offer maximum potential environmental, social and governance returns, mining organisations will also increase their economic returns. This research project shows that environment, social and governance link to economic value in five ways, namely, facilitating top-line growth, reducing costs, minimising regulatory and legislative interventions, while increasing employee productivity as well as optimising investments and capital expenditure. As a result of these benefits, mining organisation can also create SV through collaborative infrastructure development (Public-Private Partnerships/Shared Infrastructure Initiatives), investing in sustainable community development projects and catalytic Special Economic Zones. Mining organisations should recognise that infrastructure development investments can be designed to maximise benefits to other economic industries, for example, electricity generation plants also serve local communities, and roads improve the functioning of the local economy. As a result, this study argues that infrastructure development and other capital projects present an extraordinary opportunity for reinventing, repurposing and re-energising the development of the economy that is centralised on the principle of creating lasting value for all stakeholders, thus SV. Therefore, investment in infrastructure development is investing in the future, because of the potential to create a new economy and accelerating growth.

5.1.2 Strategies linked to employment conditions

The findings of this study's empirical results, together with those of the existing literature examined show that *employment conditions* is an antecedent of SV in the mining industry of South Africa. *Employment conditions* refer to philosophies and operating practices that align the expectations and beliefs of employees with those of their employer (Mustafa & Ali, 2019). Employees' attitudes and productivity are positively affected by the various practices of the employer organisations, including factors such as integrating sustainability planning in training and development, strategic employee engagement programmes, shared productive ownership, innovative performance management and reward systems, and a positive culture and working environment (trust, equity, transparency, health and safety). As a result, these practices positively affect the productivity of organisations while simultaneously contributing to a balanced lifestyle for

all stakeholders (Schnackenberg & Tomlinson, 2014). Mining organisations that invest in innovative mine waste reduction and valorisation create additional revenue while improving the health and safety of the employees, communities and environment. Dembek *et al*. (2016) also support the recommendation that providing broad-based skills development related to future job opportunities and socially focused employment strategy (SV Employment Plan) will reduce recruitment costs, while enabling the local communities to acquire wage-earning capacities.

5.1.3 Strategies linked to mineral resource governance

Although *mineral resource governance* is also found to be an antecedent of SV within the mining industry of South Africa, the empirical results of this study revealed that the relationship is insignificant. Despite mining organisations posting record profits and shareholders being rewarded handsomely, the South African mining industry is no longer attractive to foreign investors due to labour unrest, the unreliability of Eskom's electrical power and its ever rising rates, changing targets with each new version of the Mining Charter, endless procurement targets, social and labour plans that must be approved by the government and the policy uncertainty, as well as persisting shoddy governance practices (Stedman *et al.*, 2020). However, mining organisations are required to identify the areas of collaboration (beyond compliance approach) that will create mutual benefits for stakeholders, rather than overly focusing on compliance with the regulatory conditions of the host country (Mkhize, 2010; World Bank, 2018). As a result, in resource-rich countries such as South Africa, a strong mineral resource governance framework that promotes linkages is essential for long-term and diverse economic development that takes advantage of resource-led growth.

5.2 Recommendations linked to SV strategies for the South African mining industry

In addition to focusing on the antecedents of SV, the empirical results show that SV can be promoted within the South African mining industry through three approaches: reconceiving the product/service and markets, reimagining value chain productivity and development of the enabling environment (local cluster); as these approaches formed part of the SV factor of the study. Table 4 presents recommendations relating to strategies of SV.

Table 4: Recommendations linked to SV strategies

SHARED VALUE							
REF	**RECONCEIVING PRODUCT/SERVICE AND MARKET**	**REF**	**REDEFINING PRODUCTIVITY IN VALUE CHAIN**	**REF**	**ENABLING LOCAL CLUSTER DEVELOPMENT**	**REF**	**HYBRID STRATEGY**
SV1	New market for drinking/irrigation water	SV6	Policy on investment in infrastructure connectivity	SV11	Recognising conditions and advantages of the geographic location	SV1-15	Combination of all or selected strategies based on the resources and nature of societal problems to be solved
SV2	Venture into the supply of energy (IPPs/PPPs)	SV8	Eliminate negative environmental activities across the value chain	SV12	Collaboration with suppliers, competitors and equipment manufacturers		
SV3	Complementary products such as GIS technological equipment and chemicals	SV7	Inclusive business deals for low-income suppliers	SV13	Invest in cross-industry collaborations, including the NGOs and government		
SV4	Investing in industrialisation or mineral beneficiation	SV9	Local suppliers and enterprise development	SV14	Actively engage in broad-based regional economic and specialised core competence		
SV5	Developing community-oriented (intermediate) products	SV10	Enhance value chain governance: participation, equity and accountability	SV15	Developing the local employment policy to localise expertise/skills/technology to enhance innovation		

Source: Researchers' own construction.

In line with Table 4, there are three strategies of SV which mining organisations should focus on:

- Strategies linked to reconceiving products/services and markets including establishing new markets (for drinking/irrigation water, energy supply, complementary products such as GIS technological equipment, chemicals and community-oriented/intermediate products) and expanding towards mineral beneficiation and industrialisation. SV recognises that societal needs, including improving local communities and reducing environmental impact, and not only conventional needs, define markets.
- Strategies linked to redefining value chain productivity including infrastructure connectivity, eliminating negative environmental activities across the value chain, creating

inclusive business deals for low-income suppliers, local suppliers and enterprise development and enhanced value chain governance (participation, equity and accountability). Although societal problems increase the internal costs for organisations, rather than raising the cost for business, by adopting SV, the organisations can turn addressing societal needs and constraints into drivers of innovation, better operating methods and management approaches (business models).

- Strategies linked to enabling local cluster development, as an approach to SV, require organisations to recognise conditions and advantages of the geographic location, invest in cross-industry collaborations with key stakeholders (suppliers, competitors and equipment manufacturers, NGOs and government) to stimulate innovation and localise building of specialised competencies. SV recognises that to unlock the next wave of innovation and productivity growth in the global economy, mining organisations need to improve the local operating environment by supporting skills development and capacity building, knowledge sharing and support, as well as legitimising business by investing in inclusive and sustainable economic development infrastructure and networks.

6. CONCLUSIONS

The shortcomings of this study include scarce literature on SV and limited awareness regarding the subject of SV amongst the managers of the mining organisations. Due to COVID-19, not all respondents could respond timeously. Although the population and the sample of the study were drawn from leading mining organisations affiliated with the Mineral Council of South Africa, accounting for 90 percent of annual total production, it would have been of interest to include perceptions of respondents from small mines. The study gathered perceptions of management in the mining industry, and a similar qualitative study could further enrich this field of study. In addition, future research could include an empirical investigation to determine the outcomes of SV in the mining industry, in order to identify the positive results should SV be implemented by these organisations.

The study investigated the perceptions and antecedents of SV within the mining industry in South Africa. The empirical results confirmed that *automation and innovation* (through innovation for value chain inclusivity, automation and business model innovation, infrastructure development) and *employment conditions* are the antecedents of SV. The study illustrated three approaches of

SV: reconceiving the product/service and markets, reimagining value chain productivity and developing the enabling environment.

The three approaches of SV highlight that mining organisations in South Africa need to rethink their role in society and explore how to play an active role in resolving local social and environmental issues while driving sustainable economic development. Organisations in the South African mining industry have a suite of unique assets, financial resources, influence and capacity to scale, thus enabling them to address social issues in a way that other stakeholders cannot. By adopting an SV strategy, mining organisations can leverage these assets to accelerate social change through automation and innovation and improve employment conditions, while simultaneously enhancing their competitiveness and 'bottom line'.

Finally, this study makes a significant contribution to management practices, thus managers and policymakers within South African mining organisations could use the empirical results discussed above to guide the formulation of policies and strategies relating to SV within this particular industry.

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ANNEXURE 1: EFA RESULTS

EFA RESULTS PERTAINING TO THE INDEPENDENT VARIABLES

ITEMS	FACTOR 1	FACTOR 2	FACTOR 3
	AUTOMATION AND INNOVATION	MINERAL RESOURCE GOVERNANCE	EMPLOYMENT CONDITIONS
EI2	**0.750**	0.120	0.228
AI1	**0.683**	0.277	0.243
AI3	**0.676**	0.383	0.369
ID3	**0.653**	0.551	0.261
AI5	**0.647**	0.270	0.176
AI4	**0.635**	0.381	0.35
ID1	**0.630**	0.381	0.346
VC2	**0.630**	0.401	0.232
ID5	**0.626**	0.589	0.259
RL3	**0.607**	0.466	0.283
EC1	**0.583**	0.461	0.396
EI4	**0.582**	0.482	0.186

ITEMS	FACTOR 1	FACTOR 2	FACTOR 3
	AUTOMATION AND INNOVATION	MINERAL RESOURCE GOVERNANCE	EMPLOYMENT CONDITIONS
VC3	**0.580**	0.503	0.214
VC4	**0.574**	0.562	0.401
RL4	**0.574**	0.348	0.365
ID2	**0.546**	0.449	0.268
AI2	**0.539**	0.176	0.504
RL2	0.514	**0.656**	0.335
VC5	0.314	**0.599**	0.207
RL1	0.198	**0.562**	0.148
EI1	0.519	**0.541**	0.347
EC4	0.348	**0.487**	0.433
EI3	0.431	**0.442**	0.352
EC3	0.018	0.241	**0.691**
EC2	0.244	0.137	**0.670**
ID4	0.318	0.433	**0.627**
VC1	0.274	0.140	**0.551**
RL5	0.228	0.071	**0.551**
EC5	0.310	0.396	**0.537**
EI5	0.242	0.448	**0.483**
Prop Variance	**26.572**	**18.244**	**15.675**

EFA RESULTS PERTAINING TO THE DEPENDENT VARIABLE

ITEMS	ATTRIBUTE	FACTOR 1
		SHARED VALUE
SV1	Redesigned product/social innovative product	0.865
SV2	Innovatively address the needs of communities profitably	0.855
SV15	Localise international expertise, skills and technology	0.843
SV7	Integrating low-income suppliers to value chain	0.839
SV5	Driving social change from the product development stage	0.832
SV14	Enhance local collaboration to optimise benefits of specialised competence and expertise	0.811
SV9	Local suppliers and enterprise development	0.807
SV12	Collaborate with value chain participants to improve efficiency and flexibility	0.805
SV6	Increase investment in infrastructure connectivity	0.797
SV3	Conceiving complementary products/services	0.766
SV4	Reconceiving the new markets	0.741
SV13	Develop collaborative relationships with the host communities	0.739
SV10	Establish effective value chain governance (open participation, equity and accountability	0.719
SV11	Access to interconnected value chain	0.705
SV8	Eliminate value chain activities that cause pollution and global warming	0.683
Prop variance		62.266

Source: Researchers' own construction based on the EFA results from the survey responses.