UNIVERSITY OF KWAZULU-NATAL

The Economic Effect of Changing from Steel to Aluminium Beverage Packaging Metal Cans within the Packaging Industry

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DECLARATION

I, **Cecil Mlungisi Nzimande**, declare that:

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My wife, Ntokozo Nzimande, for being patient and supportive throughout this journey. I dedicate my work to my kids to inspire them. I would also like to thank my friends Ralph Bhengu and Gabriel Chukwuka for the support and knowledge sharing. To my supervisor Dr. Emmanuel Mutambara for his patience and guidance. I am also very thankful to all the respondents who helped me a lot by giving time for the interviews.

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ABSTRACT

The beverage can industry has been gaining much interest and focus because of the transition of many global players from steel to beverage cans. Some reviews have highlighted the economic effects and benefits of this transition in the packaging industry as well as local economies. Between 2014 and 2015, beverage cans companies in South Africa started converting to aluminium end with an all-aluminium can in order to meet up with the global competition that had already taken place in most part of the world. Most of these nations across the globe are ahead of South Africa in reaping the economic benefits from this conversion in the packaging industries and in their local economies. This study assessed the economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry. A qualitative study was carried out using an interview guide. The qualitative study method was used for this study because it focuses on meanings of a particular subject. This research method was used because not much has been studied pertaining the change from steel to aluminium beverage cans within packaging industry in South Africa, as the research area is still evolving. The study was carried out on seven (7) interviewees', selected using purposive sampling from five (5) different local beverage can packaging companies, and their feedback was analysed using thematic analysis. The study revealed that the global competitiveness on using aluminium beverage cans are increasing business activity, thus growing revenues for these companies. It was also uncovered from the study that there are growing business opportunities in the recycling sector, which are locally creating more job opportunities that will benefit the South African economy. The study also showed that the change was good for the economy, as local engineering and operations team skill levels were increased; as they had to be trained overseas before the changeover to aluminium beverage cans. It was also revealed from the study that environmental friendliness, cost effectiveness, quality and durability of aluminium were some of the factors driving the switch to aluminium beverage cans. The study recommended that local beverage can companies should maintain continuous training and development. This is in order to stay in the front of global positive trends in the aluminium beverage can industries in terms of employee skills. It was also recommended that local beverage can companies should seek global technical partnership, in order to assist them in understanding the changes

in the global scene. Additionally, policy makers in South Africa should also ensure that Eskom provide relevant assistance in ensuring that their electricity challenges are managed, such that these economic developments can be sustained in terms of electricity to the beverage can companies.

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List of Acronyms

BMi	Business Monitor Industrial
CAGR	Compound Annual Growth Rate
CEO	Chief Executive Officer
CE	Circular Economy
DTI	Department of Trade and Industries
GDP	Gross Domestic Product
KZN	KwaZulu-Natal
SADC	South African Development Community
SA	South Africa
SMME	Small, Medium, Micro, Enterprises
US	United States
UKZN	University of KwaZulu-Natal
UV	Ultraviolet
WSA	World Steel Association

CHAPTER 1
INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION

This study assesses the economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry. This chapter outlines the background on the topic by highlighting short overview on the subject, thereby linking it to the effects within the packaging industry. This chapter further presents the problem statement that necessitated the study, the study aims, objectives, research questions and the significance of the study. This chapter also addresses the research methodology, approach to sampling, collection of data, analysis, and ethical deliberations that guided the study. The limitations of the study and a structural arrangement of the dissertation are also seen in this chapter.

1.2 BACKGROUND OF THE STUDY

Over R1.6 billion have been spent as capital investments by many industry heavyweights like Anheuser-Busch InBev (ABInbev), Coca-Cola, Nampak Bevcan and Hulamin in a bid to translate beverage cans industry from steel to aluminium (Engineering News, 2017). The change from steel to aluminium enabled the African region to closely match other global markets, and this has positively affected the recycling statistics in South Africa (SA) (Ralph, 2017). According to the statistics that was provided by MetPac-SA (2015), who are the official body representing the interests of the SA metal packaging industry, growth was observed with regards to recycling of beverage cans in SA. The number increased immensely from about 18% in 1993 to the current rate of 72% (Ralph, 2017). MetPac-SA Chief Executive Officer (CEO) highlighted that the local industry conversion from steel to aluminium contributed greatly in accelerating the volume growth in recycling (Engineering News, 2017). This is because aluminium beverage cans are infinitely recyclable and does not show any loss in terms of strength or quality, thereby posing as affordable for collectors in the informal sector (Engineering News, 2017). These developments have made Nampak Bevcan a preferred beverage can producer in sub-Saharan Africa. As at the end of 2014, their entire Gauteng can manufacturing

lines were moving over to aluminium cans in a bid to complete an entire move from steel to aluminium cans (Ralph, 2017).

The growth in the change to aluminium from steel is also taking significant growth in West Africa. Recently, GZ Industries Limited in Nigeria have outlaid plans to expand into SA with the building of a R1 billion factory that will make them only second to Nampak Limited (Metalworking News, 2015). This appears to be an exciting news for the continent as these developments will likely increase highly skilled employment opportunities, leading up to growth in the economic local development and skills transfer (Ralph, 2017). Some of these industries have scaled up production rates through the use of aluminium lines. For example, Nampak has scaled up production at maximum speeds of up to 3000 cans per minute in comparism to 1600 cans per minute on the old tinplate lines (Ralph, 2017). These trends are also leading industry practitioners to believe that SA can match up the 97% recycling rate that is currently obtainable in Brazil (Engineering News, 2017). It is therefore essential to assess the economic effect of changing from steel to aluminium beverage packaging metal cans in the packaging industry.

1.3 PROBLEM STATEMENT

The drive for the changeover of steel to aluminium packaging in the beverage industry has been major news and change in the market over a decade. Many global beverage giants have embraced these changes due to the many benefits that follows this move. One of the growing issues in the steel industry is the expanded awareness for environmental protection (Tisza & Czinege, 2018). Recycling and consideration of life cycle are hugely associated with the regulatory rules that decide the number of recycling that takes place in a country (Tisza & Czinege, 2018). The drive to improve better recycling mandated the changeover for many of these heavyweight companies, in order to align with the global initiatives for environmental protection and minimising waste that emanate from packaging. Managing production lines in any manufacturing facility is not an easy task. The advent of aluminium packaging resulted in many leading companies exploring the option of changing from steel to aluminium, even though the option is quite expensive on its own. This increased their cost with regards to investment on new product lines in

order to remain competitive in the local market, thereby enabling them to remain sustainable in the midst of global competitiveness.

A key aspect of this change over is the merits and demerits it creates in the industry as well the economy. Although the initial change in terms of equipment installation demands a huge outlay of capital for the beverage industries, it is believed that this move will result in significant energy savings for these industries (Ralph, 2017). In essence, the energy cost to process and recycle aluminium is significantly less than that of steel; thus improving the carbon footprint. Additionally, it is believed that when these aluminium are produced that the industry will meet the demand by mostly recycling them (Metalworking News, 2015). This approach of recycling will open up the market for local businesses in the country that are into recycling, thereby bring valuable benefits to the South African economy (Engineering News, 2017). As a result, it became necessary to assess the economic effect of changing over from steel to aluminium beverage packaging within the local packaging industry.

1.4 MOTIVATION OF THE STUDY

Recent forecast shows that the metal packaging industry will continue to expand through innovation. There are number of good prospects for the sector as it will continue adapting and accommodating the needs of the modern customer in terms of shape, size, and quality (Ralph 2, 2018). Also, these growing prospects have the potential of benefiting the SA economy, as it can create jobs in the recycling section (Engineering News, 2017). This sector has already shown increasing levels in the volume growth of recycling. It is also important to highlight that recycling can also assist in reducing the poverty levels in the society, as it creates platforms for the participation of the small companies and SMME's in the potential growth in recycling (Ashkenazi, 2019). The government is looking for ways to stimulate growth in the economy. The amount of job opportunities in the recycling sector that can potentially stimulate a slowly growing economy is very high.

The price of the steel in SA is considered by many industry consultants to be high and the metal industry has been under severe pressure from other global steel suppliers like China (Makgetla, 2017). The biggest local steel producer in SA ArcelorMittal was nearly closed because of the growing price of steel. The growth in

the price of steel makes its manufacturing in some of the industries very high, thereby limiting the potential for economic growth in the economy. It is hoped that this study will help to uncover possible areas where policy makers can be helped to improve the SA local economy.

There are also factors that drive the change of processes from steel to aluminium cans within the packaging industry. The cost of steel as already highlighted in addition to the cost of setting up a steel production line to aluminium is much cheaper (Tisza & Czinege, 2018). The importance of this study is relevant as it will help in outlining the factors that influence the change processes from steel to aluminium cans, thereby enabling industry practitioners in understanding factors that could affect this process. The study will also help these practitioners to understand possible negatives that could arise in relation to the change from steel to aluminium cans in the packaging industry.

1.5 FOCUS OF THE STUDY

This study mostly focuses on the economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry. The study explores and reviews factors that affect this change.

1.6 AIM OF THE STUDY

This aim of this study is to assess the economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry.

1.7 OBJECTIVES OF THE STUDY

The study objectives are as follows:

1. To assess the perceived economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry.
2. To explore the factors that drive the change from steel to aluminium cans within the packaging industry.

3. To assess how the beverage packaging metal industry could improve the change process from steel to aluminium cans.

1.8 RESEARCH QUESTIONS

The questions below are intended to be addressed by this study. They include;

1. What are the perceived economic effects of changing from steel to aluminium beverage packaging metal cans within the packaging industry?
2. What factors drive the change from steel to aluminium cans within the packaging industry?
3. How can the beverage packaging metal industry improve the change process from steel to aluminium cans?

1.9 RESEARCH METHODOLOGY

The nature and aim of the study greatly affects the research method that is applied to such study (Flick, 2018). Generally, the approach utilised in research is usually divided into quantitative and qualitative research approach. The procedure of the quantitative research method follows the path were the subject investigation is assessed using statistical methods (Flick, 2018). In general, the quantitative research method involves gathering and assessment of data, where by feedback can be drawn from the findings (Cooper & Schindler, 2011). In contrast, qualitative research method follows communications, words and other non-numerical parameters (Dejonckheere & Vaughn, 2019). The information collected from a qualitative type of study are not assessed numerically, instead it is done utilising methods like content and thematic analysis. This study utilised the qualitative method. Seven (7) participants were selected using purposing sampling method and interviewed using the semi-structured interview approach. The feedback from the interviewees based on the interview guide were analysed via thematic method.

An important aspect of any study is the researcher's approach regarding ethics. Ethical consideration was applied such that the semi-structured interview was properly constructed to make sure that the wordings were appropriate. This was

also to ensure that the researcher was not exposed to any form of harm. Ethical clearance approval was provided by the University of KwaZulu-Natal (UKZN) ethical committee. The aim of this ethical clearance was to ensure that the content of the expected study is in line with UKZN guideline. The researcher also obtained gate keeper's letter from the interviewees before the commencement of the study. The researcher further made sure that the participants signed a consent form which allows them to withdraw from the study at any time.

1.11 LIMITATIONS OF THE STUDY

This study only focused on the economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry. This study did not consider other industries that have the potential of changing from steel to aluminium beverage packaging. Therefore, the findings from this study should not be utilised for other industries.

1.12 STRUCTURE OF THE CHAPTERS

Chapter 1 – Introduction

The introduction, chapter background, study motivation, statement of the problem, and focus of the study are presented in chapter one. This chapter also covered the aims of the study, objectives of the study, research questions and study limitations.

Chapter 2 – Literature Review

This chapter covers the review of literature and provides an overview of various aspects relating to the study. This chapter also covers various trends in the packaging industry and other global views on changing from steel to aluminium cans. This chapter further expounds on existing literatures on the topic and related topics, thereby highlighting relevant gaps in the literature.

Chapter 3 – Research Methodology

The research methodology is outlined in this chapter. This chapter also covered areas like research design, sampling approach, research instrument design, validity, reliability and ethical position.

Chapter 4 – Results and Discussion

Chapter four provides the results from the study. It also covers the discussion of the findings from the study. This chapter also compares the evaluation of the results in comparism to the literature, in order to establish possible agreements and disagreements.

Chapter 5 – Conclusions and Recommendations

This chapter provides the study conclusions and recommendations necessary for policy making. The scope for future research is also offered.

1.13 CONCLUSION

This chapter presented an overview on the aspects addressed in this introduction and background section of the study. This chapter presented the introduction and background to the study. The statement of the problem highlighting the aspects that necessitated the study was outlined. This chapter also presented the motivation of the study, research objectives, research questions, research methodology and limitations of the study. Additionally, the structure of the dissertation chapters was clearly outlined in this chapter. The next chapter presents the literature review.

CHAPTER 2
LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter outlined the introductory part of this study. This chapter presents the literature review that the researcher considers relevant to the study. This chapter also presents overview trends in the steel and aluminium industry. A review of the economic impact of the United States tariff and economic landscape of aluminium industry was also done. This chapter reviews the economic effect of changing from steel to aluminium beverage cans and also assessed the challenges that are facing this change.

2.2 EXPANSION OF STEEL MARKET IN THE TWENTY FIRST CENTURY

Many industries in the US and across the globe have their foundation on steel (Reed, 2019). These industries range from construction, energy, engineering, transportation and military defence. The reliance of these industries makes it easy for developments and variations in steel markets to easily affect them at every instance (Reed, 2019). The World Steel Association (WSA) refers to steel as the most vital engineering and construction material, as it contributes to social development and growth of many economies (Cerasa & Buscagalia, 2019). A steel sector that is robust provides the basis of many global industrial value chains like constructions and infrastructures development (Cerasa & Buscagalia, 2019). This also covers other sectors like equipment, chemicals, metal products, ship-building and aerospace industries (Cerasa & Buscagalia, 2019).

A report by the WSA, compiled by Deloitte showed that the global steel production and usage growth was sustained in 2017, even though it was not as rapid as before (Sedov, 2018). For instance;

- The output of steel increased by 3.8 percent which resulted in 1,690 million tonnes;
- Consumption of steel increased by 5.1 percent to 1,693 million tonnes.

In 2018, the first two quarters showed that the global steel output reached 1,036 million tonnes, up by 5.2 percent in comparison to the same period in 2017. As at the end of 2018, the global steel production increased by 4.9 percent to 1.803 billion tonnes according to the figure below, while world steel consumption increased 4.0 percent to 1.792 billion tonnes (Sedov, 2019). This increase was majorly influenced by China and was due to the fact that their production rose by 7.8 percent in comparism to 1.9 percent for the rest of the world (Sedov, 2019).

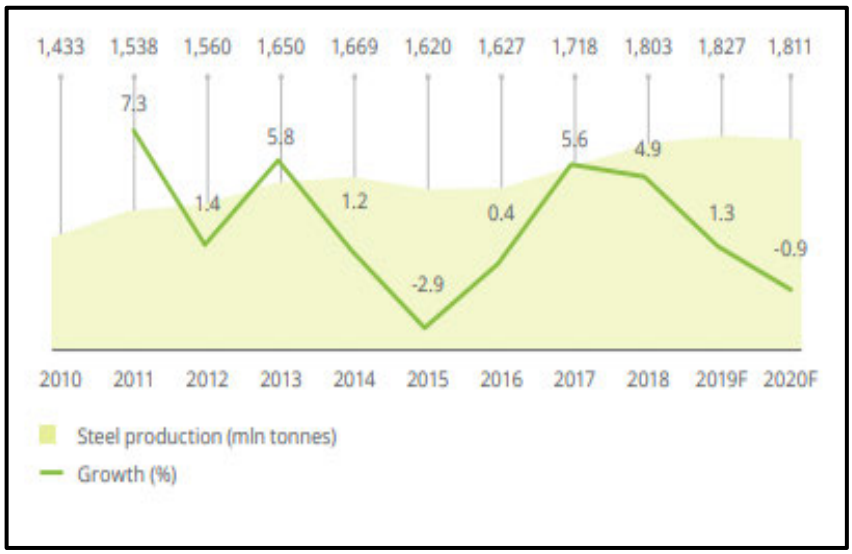

Figure 2- 1: Global steel output (Sedov, 2018 pg. 7)

The feedback from WSA showed that global production rose to 3.8 percent in the first two months in 2019 which was also driven by increasing output from China (Sedov, 2019). The feedback from experts from the Economist Intelligence Unit (EIU) are looking at a possible decrease in steel prices in 2019, which is considered that it will likely result in a negative growth down to 1.3 percent (Reed, 2019). An additional reduction of about 0.9 percent fall in production across the world is expected in 2020 (Reed, 2019).

In terms of the steel output by region, Africa is considered one of the smallest outputs on steel production as a region (More, 2019). A review by WSA which is highlighted by the figure 2-2 below.

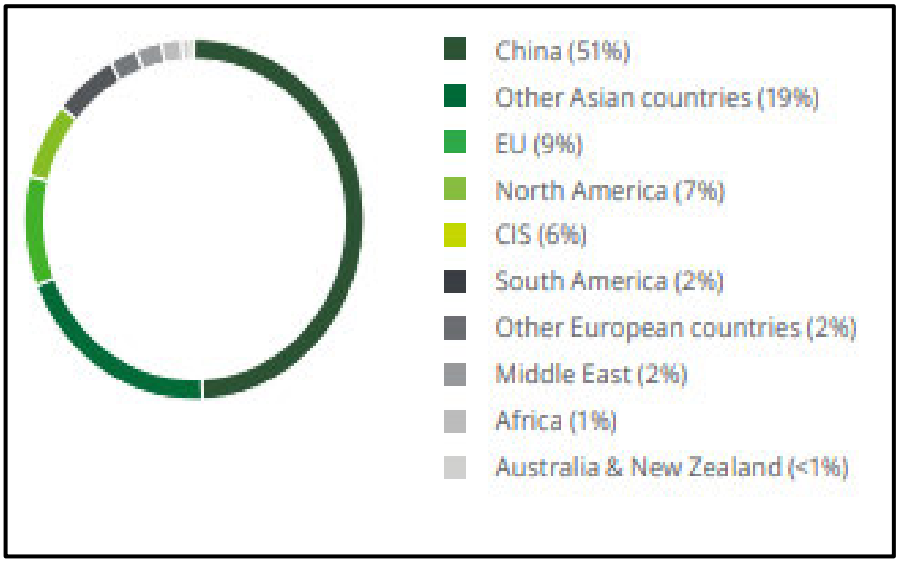

Figure 2- 2: Global steel consumption by region (%, 2018) (Source: Sedov, 2019 pg. 10)

From the figure above, Africa appears to be one of the lowest consumer of steel consumers by region (Sedov, 2019).

2.3 SIGNIFICANCE OF THE BEVERAGE PACKAGING SECTOR

A circular economy is usually expected to maintain natural and other forms of resources as long as possible; hence a circular economy (CE) is aimed at maximising the highest value as much as possible and also reviving products at the end of their service life (Moodley, 2019). The goal of a CE has garnered supports from many governmental leaders, as it aligns properly with various business agenda's (Niero & Hauschild, 2017). The frequency of business transactions that takes place in the packaging sector is estimated at over 207 million tonnes across the globe at an equivalence of $384 billion annually (Niero & Hauschild, 2017). The significance of the beverage sector is huge, such that beverage packaging depicts the second largest source of aluminium scrap (Niero & Hauschild, 2017). As at 2012, beverage packaging using aluminium further represented that majority of what was produced were primarily for beer packaging even though a major gap remains the management of the corresponding waste (Omarjee, 2018). In general, the beverage packaging sector is a significant part of many global economies and this trend is expected to continue growing.

2.4 STEEL INDUSTRY TRENDS IN SOUTH AFRICA

2.4.1 Overview and Impact of US Tariff

The positive growth in the steel industry globally is a welcoming news, considering that the current trade war between the US and China is building uncertainty on the steel producing nations whose products, like those from Turkey are focused for the US market (Moodley, 2019). The US decided to impose a 25 percent tariff on steel imports, even though some key exporting countries secured exemptions from all their steel products (Moodley, 2019).

In the midst of these trade war, US granted SA tariff exemptions on “161 aluminium” and “36 steel products” late 2018, according to the department of trade and industry (DTI). The US had imposed a 10 percent valorem tariff on imports of aluminium products, and 25 percent valorem tariff on steel products to a number of countries in line with the goal and strategy of developing US economy (Omarjee, 2018). The then trade and industry minister, Rob Davies highlighted that the tariffs would create a risk to jobs in the local metal industry (Omarjee, 2018). This news outcome was a result of severe negotiations with the US government (Omarjee, 2018). This news was also welcomed by the Steel and Engineering Industries Federation of Southern Africa (SEIFSA), who stated that this is a positive news for SA companies which export to the US market (Omarjee, 2018). Prior to this news, some of these local companies’ worries were increasingly building up over the possibility of losing US market shares and not renewing existing agreements with some US buyers (Omarjee, 2018).

2.4.2 Steel Production and Output in South Africa

Steel making deals with the production of flat-rolled low carbon steel utilised by the construction sector in the delivery of big infrastructure projects (Liedtke, 2018). In SA, ArcelorMittal is the biggest producer of flat steel, even though they have faced many challenges with regards to the market conditions, stagnant growth in the SA economy that is growing less than 1 percent per annum and a highly indebted economy (Moodley, 2019). The SA construction sector, being the largest consumer of steel encountered tremendous pressure with little hope of growing after the 2019 elections. This is because it takes years to start off capital projects and there is small

hope whether the construction sector will grow in the next coming years (Moodley, 2019).

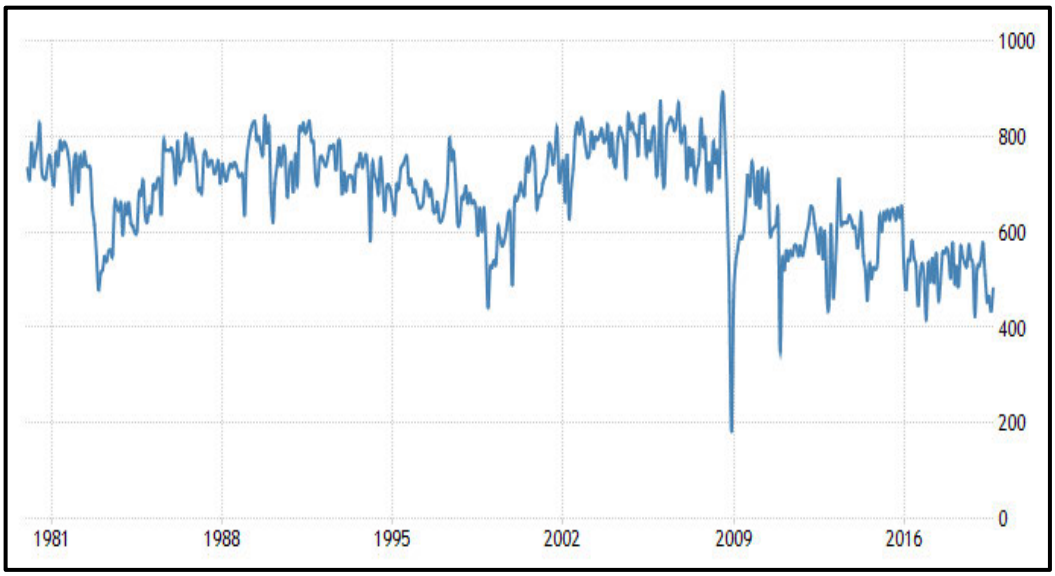

Figure 2-3: South Africa steel production (Source TradingEconomics.com)

The figure above shows that steel production in SA grew to 481 000 Tonnes in September 2019 from 434 000 Tonnes in August of 2019. Steel production averaged 679 000 tonnes from 1980 until 2019, reaching an all-time high of 885 000 tonnes in August of 2008 and dropped to a low level of 182 000 tonnes in December of 2008.

2.4.3 South Africa Imports of Steel Products

The SA's steel industry has been in a constant decline since 2010. Asides from the weak demand, a major cause of the decline was considered the cheap steel imports (Department of Trade and Industry, 2018). This adversely affects the profitability and capacity utilisation rates of the domestic steel producers, which is already aggravated over the years due to the situation of global excess capacity and dwindling domestic primary steel production competitiveness (Department of Trade and Industry, 2018). The figure below shows the primary steel imports into SA.

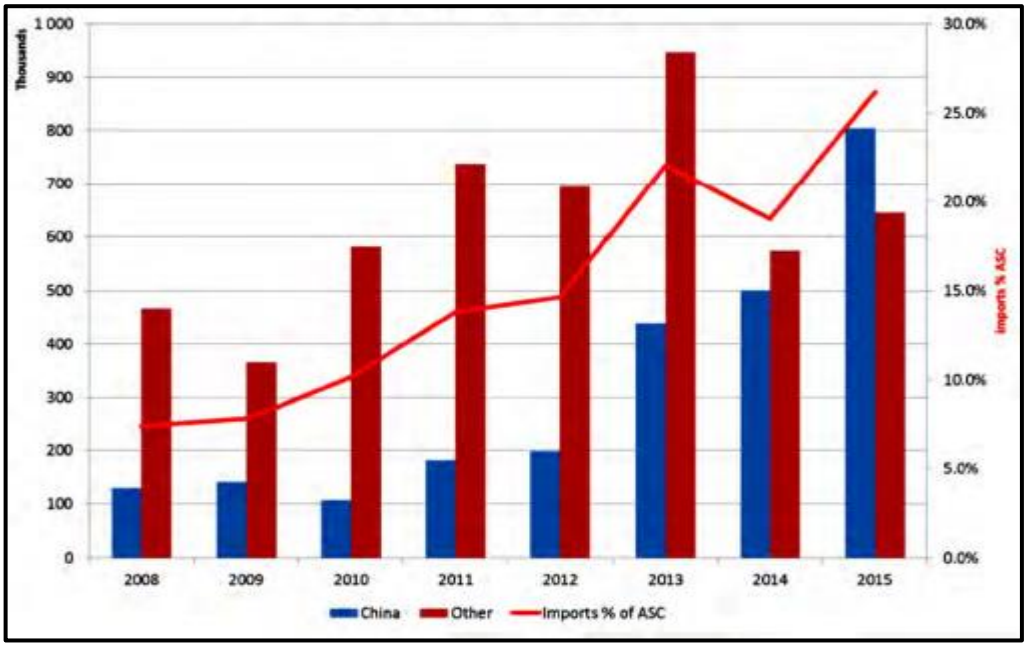

Figure 2-4: Primary steel imports into republic of South Africa (Source: Department of Trade and Industry 2018, pg. 8)

It is very clear from above that total imports of manufactured steel products had gone up by more than 250 percent from 2008 to 2015. The figure further shows that the imports from China also increased from about 4 percent in 2008 to 24 percent in 2015.

In all these SA trends overview above, the steel beverage packaging cans are also included. This shows that further decline in the production of steel in the country, local utilisation for finished products like beverage cans and exports will further affect the economic benefit of steel to SA as an economy. It is still essential to assess the trends in the aluminium industry and whether the change from steel to aluminium is of good economic benefit to the SA economy.

2.5 OVERVIEW OF THE ALUMINIUM MARKET

Aluminium is the third richest element on the earth. No other metal can be paralleled to its resourcefulness. It is also very popular because of the benefits (Zhu & Cooper, 2019). These benefits include, strength, lightweight, durability, corrosion resistivity, malleable, ductility, conductivity and odourless (Zhu & Cooper, 2019). There is a strong focus on using aluminium for packaging due to its recyclability (Department of Trade and Industry, 2017).

According to a report by Technavio, the world aluminium market size is expected to grow by 23.88 million tonnes between 2019 and 2023 (Technavio, 2019). The figure below shows some of the expected trends around the aluminium industry.

Figure 2-5: Aluminium market forecast for 2019 to 2023 (Source: Technavio, 2019)

The figure above shows that aluminium market will be growing at a compound annual growth rate (CAGR) of almost 5 percent per annum, resulting in incremental growth of 23.88 million tonnes (Technavio, 2019). Zhu and Cooper (2019) highlighted that analysts forecast that the global Aluminium foil market will grow at a CAGR of almost 6 percent during the period 2019 to 2023. This means that global analysts are looking at aluminium CAGR growth of between 5 to 6 percent globally. From the figure above, a year over year growth rate for 2019 was estimated at 4.10 percent (Technavio, 2019). This review uncovered that three quarter of the growth will come from the Asia Pacific region, which covers countries like China, Japan and India (Technavio, 2019).

A major aspect that is of vital interest to this study is aluminium packaging cans. According to the figure above, one of the key drivers for the Aluminium market will be the increasing demand for aluminium cans in the beverage industry (Technavio, 2019). Previous reviews have indicated that aluminium foil is broadly utilised for packaging food and beverages, consumer goods and personal care products (Zhu & Cooper, 2019). As at 2018, the food and beverage packaging segment held the

biggest market share, and this is expected to remain common over the forecast period of 2019 to 2023 (Zhu & Cooper, 2019).

2.5.1 Impact of US Tariff on Aluminium – Implications to Emerging Markets and Developing Economies

The aluminium industry was also affected by the tariff that was placed by the US government (Zhu & Cooper, 2019). About 1.6 percent of total US aluminium import comes directly from SA (Winning, 2018). The tariff from the US government on aluminium was 10 percent on aluminium riled metals that is produced worldwide (Winning, 2018). The United States department of commerce later granted exemptions for 161 aluminium according to the DTI (Department of Trade and Industry, 2018). The ongoing trade strains between China and US have high repercussions to other economies, predominantly the emerging markets and developing economies (KwaZulu-Natal Provincial Treasury, 2018). Some of the ripple effects to these emerging markets includes investors pulling out their assets and relocating them to the safe havens (KwaZulu-Natal Provincial Treasury, 2018). The resultant effect is that it puts pressure on emerging market currencies; growing inflation and also leads to interest rate hikes. This is in addition to the effect of the strong dollar, which increases the cost of the foreign currency denominated debt in developing economies, resulting in less money being available for national spending (KwaZulu-Natal Provincial Treasury, 2018).

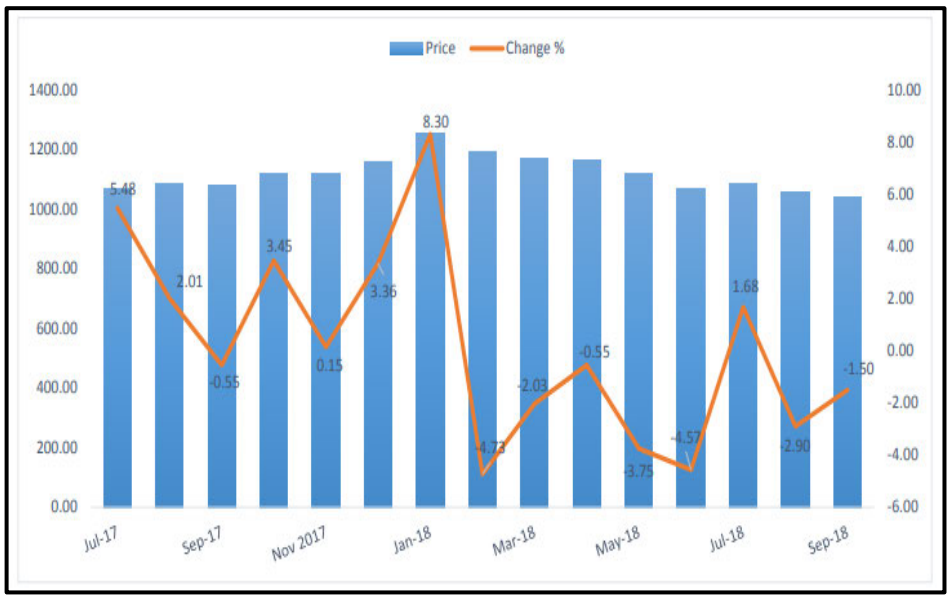

Figure 2-6: Emerging market index from July 2017 to September 2018 (Source: KZN Provincial Treasury 2018, pg. 5)

Additionally, stronger dollar stimulates emerging market sell-off by investors for better gains in the US. The decrease in the emerging markets is seen in the emerging market index in the figure above, which covers about 24 countries (KwaZulu-Natal Provincial Treasury, 2018). The emerging economies market index fared well in 2017 as reflected in the figure 2-6 above but started showing a downward trend thereby realising negative growth (KwaZulu-Natal Provincial Treasury, 2018). In essence, the negative effects from the trade war include deteriorating export volumes, high import cost, volatility of exchange rate, capital outflows in addition to others.

2.5.1 The South African Aluminium Industry, its People and Market Sector

Every industry is as strong as long as the people are happy. Asides job creation for communities in its surrounding, the aluminium industry must also produce downstream opportunities for employment and business creation (Department of Trade and Industry, 2017). The figure below shows aluminium market sector sizes for 2014.

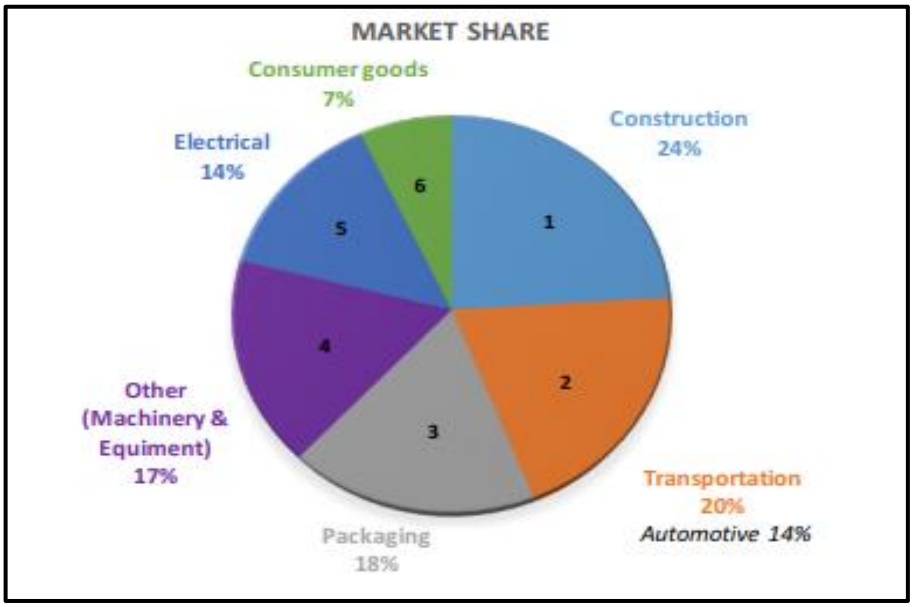

Figure 2-7: 2014 SA Aluminium market sector sizes (Source: Department of Trade and Industry 2017, pg. 22)

From the figure above, the construction market leads in aluminium consumption followed by transportation, while packaging applications of aluminium covers the third largest market. Again, the move towards utilising aluminium for packaging in food and beverages makes the packaging final products an attractive niche to observe. Even though these opportunities exist and have the potential of boosting the South African economy, other local challenges in the aspect of electricity are constantly diminishing these potentials (Moodley, 2019).

2.6 CHANGING FROM STEEL TO ALUMINIUM BEVERAGE CANS

Alcoholic and non-alcoholic beverages, like energy drinks, juices, and beers are packaged using beverage cans. Growing consumption of canned beverages in key sporting events like the Barclays Premier League, Major League Baseball, La Liga and other events expand market growth (Sawant, 2019). The beverage sector is dominated by the use of aluminium and steel cans. Current trend over three decades now is that aluminium packaging for beer, carbonated soft drinks, and energy drinks has increasingly dominated over the product segments (Wood, 2019). The US began this change in the 1970s and it was also seen to have had a positive influence on the recycling statistics. This is also true as North America region dominates the global beverage cans market. Asia Pacific region is forecasted to grow at the highest CAGR during the forecast period (Wood, 2019).

As with many consumer trends in the 21st century, aluminium beverage cans use is growing. It is important to highlight that this was also adopted by some breweries that assessed the possibility of improving the shelf life and freshness of craft beer, like Oskar Blues canning Dale's Pale Ale in 2002 (Slater, 2019). In countries like US, the sale of wine in cans also increased from $2 million in 2012 to $69 million in 2018 (Slater, 2019). It was highlighted that the benefits of cans are numerous. According to the founder of Tiny Keg Can Co, a mobile canning company that entered SA market early 2019, the product is protected by the aluminium casing hence retains flavour and aroma, while keeping oxygen (O_2) and ultraviolet (UV) light out, thereby resulting in a longer shelf life (Slater, 2019). The biggest challenge for this evolution of changing to aluminium beverage cans with regards to wine, was the preconceived idea that liquid from cans will taste like metals (Slater, 2019).

However, it is important to note that these challenges have not been exhaustively reviewed as not many of the local wine producers have explored the feasibility of using beverage cans for the packaging of the wines.

The aluminium can have a thin film inside that restricts the liquid from interacting with the metal. The trend on the use of aluminium is growing for many global producers like the Ball Corporation. The Figure 2-7 below shows their shares growth between 2011 and 2019.

Figure 2-8: Ball Corporation Share Growth (Source: Bloomberg, 2019)

The figure above shows a significant growth for Ball Corporation. The Ball Chief Executive Officer John Hayes further highlighted that the growth in the changeover to aluminium has happened so fast, such that they are trying to meet up with the demand (Deaux & Yue Li, 2019).

2.6.1 Approach on Changing to Aluminium Beverage Cans

SA's beverage cans, particularly those filled locally have for many years been manufactured from tin-plate steel body with the end as aluminium, while many of the imported drinks have been in all-aluminium cans (Hulamin, 2018). In course of 2013 and 2015, beverage cans companies in SA started their change over from a steel bodied can with an aluminium end to the all-aluminium cans. Some of the

companies like Nampak mapped out some initiatives in delivering this strategy (De Ruyter, 2014). They set up plans on assets, covered recapitalisation, consolidation, and expansion. They also planned for a clear operational excellence, service focus, quality of people; that is training their team and applying a “can do” marketing approach (De Ruyter, 2014). Nampak started their conversion to aluminium lines from 2013 into 2014 and completed them in 2015. Adjustments were made in their international production lines from 2015 into 2016 (De Ruyter, 2014). Some of the SA beverage cans companies also followed the same approach, such that the change was not done in a haste; as they followed a step by step approach (Hulamin, 2018). Some of the approaches that were applied by some companies was to first train their engineering and operations team overseas for this change over, before implementation locally (Ashkenazi, 2019). Kennedy (2017) argues that some companies did not entirely do the changeover timeously, because of delayed planning and other internal factors. However, one can clearly say that SA beverage cans producers have moved proactively in changing over from steel cans to wholly aluminium beverage cans. Nevertheless, it is not very vivid if these changes by the local companies have maximised their expected goals and forecast. It is important to futher review the findings from these initiates, in order to ascertain how they have benefited these companies and local economy. The next section examines the economic effect of changing from steel to aluminium beverage metal cans within the packaging industry.

2.6.2 Environmental Friendliness of Aluminium Packaging

The focus on environmental friendliness of packaging materials has made aluminium packaging very advantageous for several economies. The initiatives to utilise products that are eco-friendlier is growing through many global beverage markets (Deaux & Yue Li, 2019). There a strong emergence of aluminium as a more sustainable option to address the environmentally mindful consumers (Deaux & Yue Li, 2019). In the United States, this drive is pushing to displace the entrenched position of plastics in the American drink industry, as there is a boost in the growth of organisations like the Ball Corporation which is one of the largest aluminium can manufacturer in the world (Deaux & Yue Li, 2019). Another review strongly suggested that aluminium cans are more environmentally friendlier than bottles

(Hamilton, 2018). Aluminium cans are strongly favoured to be more environmentally friendly because they are easily recyclable (Hamilton, 2018).

A research from Frontiers in Marine Science indicated that most of the plastic manufactured so far across the globe have been discarded as waste, resulting in environmental and social damage of about $2.2 trillion a year due to the pollutes of the world's oceans (Deaux & Yue Li, 2019). Latest trends have also shown that Nestle SA and Unilever have publicised plans such as changing wrapping material and making packaging recyclable or reusable (Deaux & Yue Li, 2019). Additional trends in SA is showing that beverage can companies like Nampak is working on changing their plastic beverage bottles with aluminium cans, due to the growing resistance of consumers to plastic packaging (Nampak, 2019). This is because they are exploring more environmentally friendly options to their product packaging (Nampak, 2019). This highlights that usage of aluminium packaging is a growing market in SA, poses a viable economic benefit to the local economy.

Aluminium is a material that has a high demand that is highly popular due to its environmental friendliness (CSIR, 2017). It is largely used in renewable energy and water projects, and it is also preferred because of its friendliness in terms of design. Aluminium has the potential to reduce the carbon footprint of the transportation sector due to its strength and light weight characteristics (CSIR, 2017). There is a high cost involved in the production of aluminium because it is an energy and water consumer. As a result, it is essential that it is produced responsibly. The figure below summarises the responsible production of aluminium and related products in South Africa.

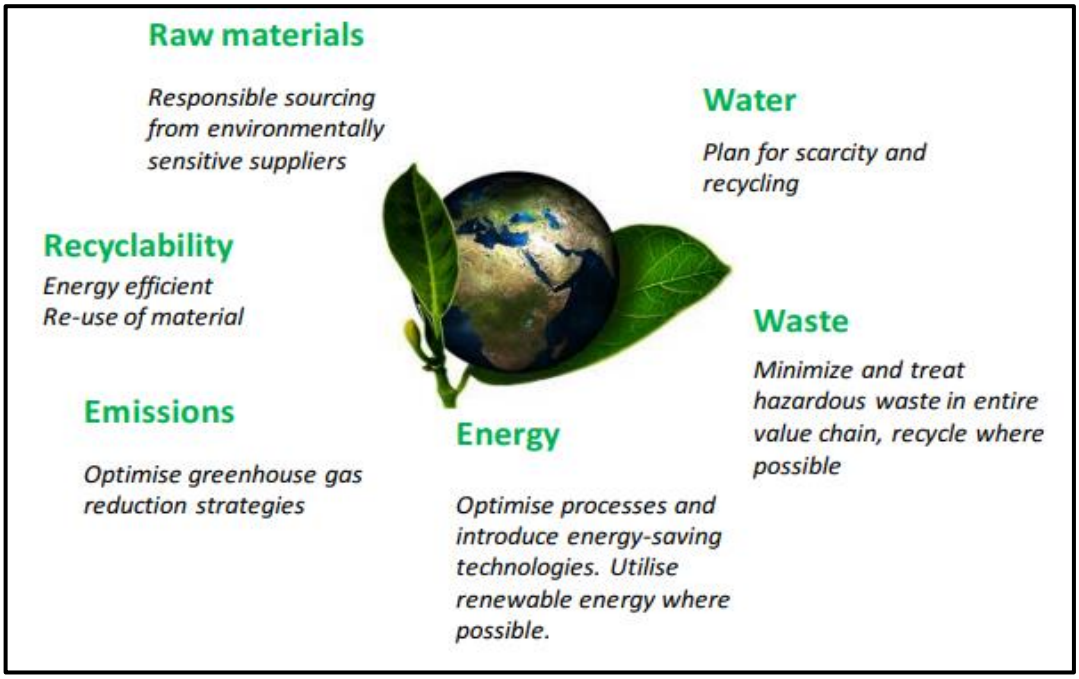

Figure 2-9: Responsible production of aluminium and related products in South Africa (Source: CSIR, 2017, pg. 19)

2.7 ECONOMIC EFFECT OF UTILISING ALUMINIUM BEVERAGE CANS

This section expounds on the economic effects of changing from steel to aluminium beverage cans. These include;

2.7.1 Growth in Aluminium Recycling creates Economic Value

An average employee consumes about 2.5 aluminium cans worth of beverages daily (Hulamin, 2018). As a result of this, there is a growing initiative to encourage recycling programmes which will enable aluminium beverage cans to be moved to recycling centres for recycling instead of ending up in landfills (Dagwa & Adama, 2018). Typically, used aluminium cans are recycled and returned to a store shelf as a new can in a period as short as eight weeks (Hulamin, 2018). Ideally, only about 5 percent of the energy required to generate new aluminium is needed to recycle scrap (used aluminium) back into a new aluminium (Hulamin, 2018). This further highlights the fact that recycling aluminium conserves valuable amounts of energy and can be done without any loss to its original properties (Hulamin, 2018).

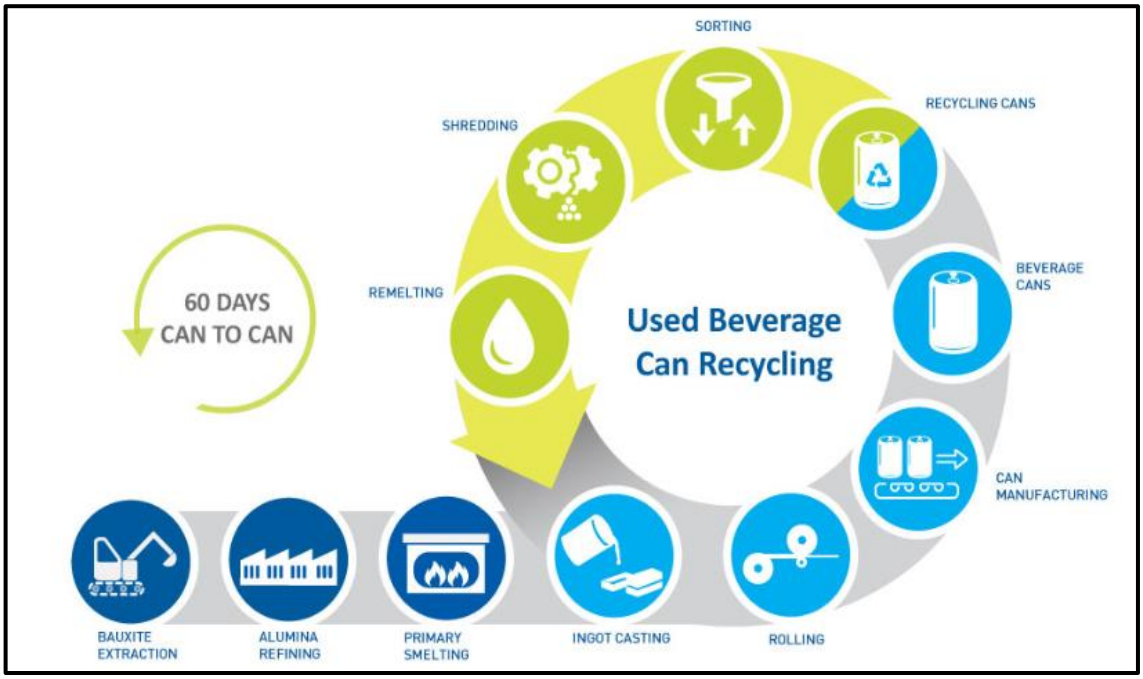

Figure 2-10: Lifecycle of aluminium (Source: Hulamin, 2018)

The figure below shows a typical lifecycle of aluminium. The process takes up to 60 days and can save about 90 percent of the energy costs needed in the primary production of the aluminium cans (Hulamin, 2018). According to Kennedy (2017), the impact of recycling aluminium beverage cans are worth more than $800 million dollars, as each year the aluminium industry pays out over $800 million dollars for empty aluminium cans. Even though these statistics have been put forward by Kennedy (2017), it is important to explore how these can be drilled down to the SA economy such that similar metrics can be easily obtained as a means of tracking how growth in aluminium recycling creates value.

2.7.2 Growth in Aluminium Recycling promotes Job Creation

As already stated above, an average employee consumes about 2.5 aluminium cans worth of beverages. This is one of the major reasons why government also supports recycling as they can provide economic incentive for individuals and small businesses that engage in recycling (Kennedy, 2017). In South Africa, between R100 million and R200 million a year will flow into the scrap metals and recycling industry as a result of the conversion from tin-plated steel cans to aluminium cans (Hancock, 2013). For instance, Hulamin recycles used beverage cans at their

recycling facility in Pietermaritzburg and have commissioned a major recycling plant. This R300 million investment project covers the installation of a new used beverage cans, cleaning line and a recycling furnace (Hulamin, 2018). This recycling plant will produce more jobs in the region which is a direct result of aluminium beverage cans recycling.

Figure 2-11: European aluminium recycling industry - recycling production in 2014 (Source: Garczyńska 2015, pg. 8)

The figure 2-11 above shows the European aluminium recycling industry in a snapshot. The trend shows the level of job creation that can be achieved through recycling (Garczyńska, 2015). Slater (2019) also highlighted that recycling of aluminium cans creates informal employment through entrepreneurial recycling endeavours. Even though it is highlighted that the potential of job creation exists in changing from steel to aluminium beverage packaging metal cans, this study is targeted at addressing this gap.

A review by CSIR in 2017 on behalf of Packaging SA uncovered that potential economic opportunities could be achieved via packaging recycling in South Africa (Mpact Recycling, 2019). The investigation revealed that over R712 million in value could be uncovered via the recycling of waste materials, which could provide jobs and also increase cost savings as a result of diverting recyclable waste from landfills (Mpact Recycling, 2019). However, there is necessity for the government to work in

conjunction with these local companies in order to put in place systems to manage and monitor how these potentials recycling opportunities will add to job creation.

2.7.3 Increased Economic Activities on Aluminium due to Beverage Cans

The globally competitive dynamics around the aluminium industry have created adverse effects for SA's own aluminium industry, which is a small fish in a big pond (Industrial Development Corporation, 2018). This implies that the local aluminium industry is a price-taker with minimal pricing control. The expected growth in the primary aluminium production in SA has been limited by electricity supply difficulties that have increased the infiltration of primary metal imports into the local market (Industrial Development Corporation, 2018). Weak demand in the region and decreasing capacity in the domestic downstream industries, especially aluminium foundries have increased the reliance of SA's primary aluminium industry on export markets (Industrial Development Corporation, 2018). The table 2-2 below shows the top sources of US imports of the affected aluminium product.

Table 2-1: Top sources of US imports of the affected aluminium products, and leading global destinations for South Africa's exports of such products

Top sources of US imports of aluminium products	Value in 2017 (USD million)	% of total
Canada	7 227.7	37.4%
China	2 525.0	13.1%
Russian Federation	1 646.1	8.5%
United Arab Emirates	1 502.4	7.8%
Bahrain	602.7	3.1%
Argentina	570.7	3.0%
Mexico	521.3	2.7%
Germany	455.3	2.4%
India	424.3	2.2%
South Africa	**353.9**	**1.8%**
Other countries	3 489.2	18.1%
World	**1 9318.7**	**100.0%**

Top destinations for SA exports of aluminium products	Value in 2017 (USD million)	% of total
USA	**375.4**	**23.7%**
Thailand	181.0	11.4%
Japan	136.9	8.6%
Netherlands	119.9	7.6%
Germany	74.5	4.7%
Belgium	68.3	4.3%
Switzerland	62.5	3.9%
Italy	47.3	3.0%
Turkey	45.0	2.8%
Hong Kong, China	35.6	2.2%
Other countries	438.0	27.6%
World	**1 584.4**	**100.0%**

(Source: IDC, 2018 pg. 13)

It is clear from the above that SA exported about 1.8 percent of the total aluminium to the US market, which denotes about 23.7 percent of SA export globally. It is

important to highlight that SA was later exempted from this US tariff later in 2018. However, moving over to aluminium beverage can is still an opportunity for SA to leverage on the aluminium resources locally. This can be done by the development of more finished products for local manufacturing, which means more value should be added to the raw materials and commodities prior to export (Steenhoff-Snethlage, 2018). Utilising aluminium beverage cans through locally refined aluminium source will result in an increase in gross domestic product (GDP) and profitability from exports as more valuable aluminium products can be exported (Steenhoff-Snethlage, 2018).

Again, market penetration potential in African economies beyond Southern African Development Community (SADC) region remains obviously unexploited (Industrial Development Corporation, 2019). The figure below represents SA's exports to the rest of Africa.

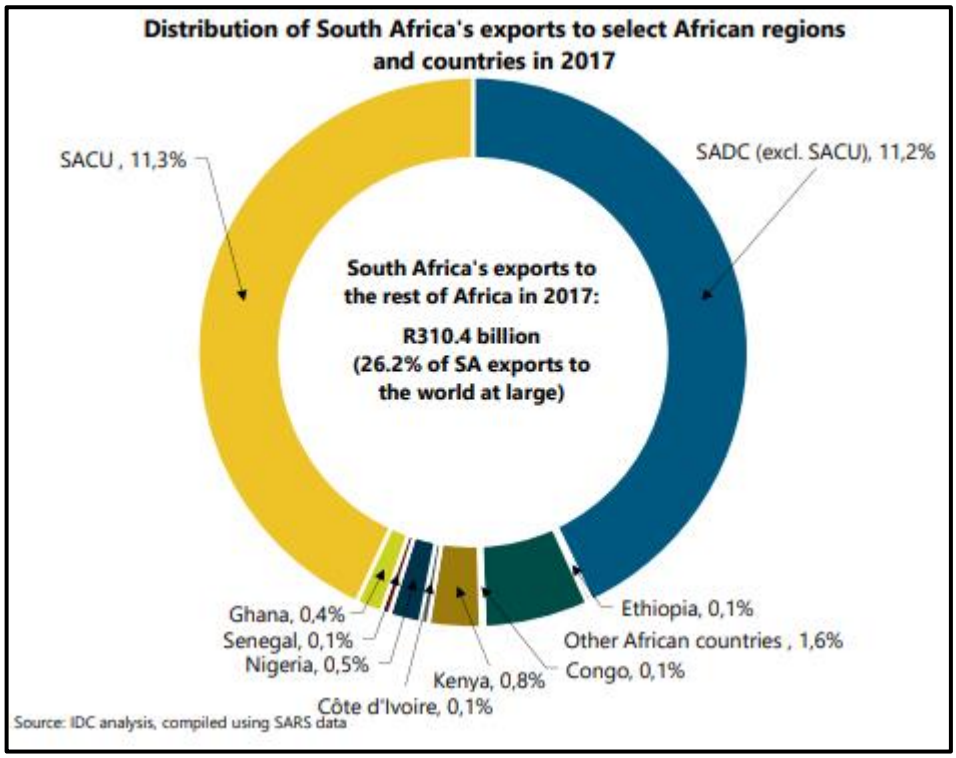

Figure 2-12: South Africa's exports to the rest of Africa are highly concentrated on SADC (Source: IDC, 2019 pg. 8)

The figure above showed that African markets outside of the SADC area accounted for only 3.7 percent of SA's total merchandise exports in 2017 and only 5.2 percent of SA's total exports of manufactured products. Many Sub-Saharan African

countries that are not members of SADC and Southern African Customs Union (SACU) have relatively sizeable overall import markets and are expected to demonstrate strong average annual growth in merchandise import demand in the next couple of years (Industrial Development Corporation, 2019). Some of them include Nigeria, Kenya, Ethiopia, Ghana, Tanzania, Côte d'Ivoire, Senegal and Congo (Brazzaville).

Nigeria is not only one of Africa's largest economies (20.5 percent of continental GDP) but also one of its key importers globally. International Monetary Fund (IMF) forecasts an average import rate of 8.9 percent over the period 2019 to 2021, yet imports from SA represented only 1.2 percent of Nigeria's overall import in 2017 (Industrial Development Corporation, 2019). Again, Ethiopia is one of Africa's fastest growing economies with IMF forecast of an average annual growth in real GDP of 8.3 percent over 2019 to 2021, while Ethiopia represented a tiny 0.1 percent of SA's total merchandise export basket in 2017 (Industrial Development Corporation, 2019). Another view argued that even though many Sub-Saharan African economies may be challenging as potential export markets, other world producers are leveraging on the market opportunities that exist in these economies (Ee, 2016). This shows that there is a gap that needs to be addressed by the SA economy, which can increase business activities through other merchandise sources like aluminium beverage cans. In essence, this is an area where positive effect can be demonstrated through the use of aluminium beverage cans within the packaging industry, considering that SA is a major exporter of aluminium in Sub-Saharan Africa.

2.8 CHALLENGES FACING MOVING FROM STEEL TO ALUMINIUM BEVERAGE CANS

Like many other sectors in SA, the metal packaging industry are still open to effects of the nation's economic slowdown. This section of the literature review evaluates some of the possible challenges facing the movement from steel to aluminium beverage cans. These include;

2.8.1 Impact from Industry Contraction

The Business Monitor International (BMi) research provides macroeconomic, industry and financial market analysis that addresses over 24 industries and more than 200 global markets. BMi report uncovered that the metal industry contracted by 5.8 percent in volume and 0.8 percent in value in 2017 (Singh, 2018). It was revealed that the metal packaging sector contracted a little to 162 000 tonnes in comparism to 175 000 tonnes in 2016 (Singh, 2018). The impact from the challenging economic conditions in the SA economy is proving to be a key determinant in packaging trends across product categories in the South African market environment. Many industries are assessing ways to keep cost low and consumers are keeping closer attention towards their household budgets (Singh, 2018). These economic pressures are creating a diverse impact across, and even inside categories. The resultant effect is a growing demand for both smaller and larger pack sizes, plastic pouches and no-frills packaging (Singh, 2018). However, the feeling is that the market share with regards to packaging will remain constant at around 197 000 tones over the next five years, since metal packaging is remaining the preferred material considering the pressure from the government with respect to industry waste management plans (Kennedy, 2017). Nevertheless, this view fails to address the possibility of new trends occurring in the market that will inject fresh momentum in this sector; which should not be overlooked.

2.8.2 Health Shaping Consumer Demand in Packaged Food and Cans

According to Hoque, Alam and Nahid (2018), global consumption and the market for functional foods and packaged drinks are driven by consumers' health consciousness. In addition, the ever growing awareness of gaining knowledge is largely attributable to the health consciousness discerned by consumers (Hoque, et al., 2018). Even though maintaining low prices remains a vital factor in the SA packaged food industry, evolving customer attitudes and lifestyles are building a growing influence on packaging developments (Singh, 2018). A more popular trend among these are the demand for more convenient packaging options that are harmonious with the growing pace and on the go character of modern urban way of living. Another view based on 2019 packaging outlook indicated that one of such

challenge is addressing the misperception among some consumers segments, who believe that canned food and drinks are less healthy (Rosenblatt, 2019). This is in addition to the increasing popularity of packaging that appeals to the rise in consumer health consciousness (Hoque et al., 2018). In essence, consumer demands in line with their well-being will keep bringing up different challenges that the packaging industries need to address at each time.

2.8.3 Economic Factors Affecting Demand for Pack Size

According to Stacey, Mudara, Ng, Walbeek, Hofman and Edoka (2019), growing number of nations are implementing taxes on sugar-sweetened beverages in a bid to minimise sugar intake, obesity, and related metabolic conditions. A major angle of the effect of such taxes is how they create changes in the prices of taxed beverages and their untaxed replacements (Stacey et al., 2019). In terms of non-alcoholic drinks market, the SA environment is observing a significant trend towards smaller packaging typically driven by economic factors (Singh, 2018). This includes a drop in the purchasing power of consumers and the advent of the sugar tax (Singh, 2018). The sugar tax levy came into effect to curtail the sugar intake of consumers (Arthur, 2018). Prior to the sugar tax which came into effect at the beginning of 2018 second quarter, it was already putting a key influence on the development of packaging in the non-alcoholic industry since the soft drinks producers moved to smaller packaging in expectation (Singh, 2018). Conversely, the alcoholic drinks market has observed an increasing demand by budget-conscious consumers who are advocating for larger pack sizes and better value for money products, like the 400 ml and 500 ml beverage cans in beer.

2.8.4 Commitment to Creating a Circular Economy

According to Stewart, Niero, Murdock and Olsen (2018), a linear economy is such where the value chains are focused on extracting resources, utilising them in producing products which are thrown away at their end of life. The idea of a circular economy provides an alternative landscape, focused at facilitating economic growth that is aimed at removing any resource constraint (Stewart et al., 2018). It is also a system that is regenerative and restorative in terms of economic resources (Stewart

et al., 2018). A circular economy creates a platform for addressing the issues of resource scarcity for both policy makers, stakeholders and industries (Stewart et al., 2018). MetPac-SA highlighted that there is a need to create a circular economy which reduces reliance on virgin metals through the use of metals that are already within the economy in order to sustain metal packaging in the economy for the years to come (Singh, 2018). In order to sustain the continued use of aluminium beverage cans, there is need for the economy and industries to maintain a circular economy.

2.8.5 Energy Cost for Aluminium Production Processes

According to Burns (2015), electricity alone is usually considered as covering about a third of the cost of aluminium ingot, even though the sale prices that are used are normally open for debate. Even though some of the smelters are closer to about 12,500 kWh per ton, it can also be assumed that some smelters are utilising electricity between 14,500 to 15,000 kWh per ton of the produced ingot, which equates to about $0.029 per kWh (Burns, 2015). This cost will vary from one smelter to another, and from one country to another considering that local cost of production varies. In comparism, the producers of aluminium from China are more open with their cost of power. For instance, the Guangxi smelters typically use 14,500 kWh per ton and are paying $0.050 to 0.055 per kWh (Burns, 2015). Obaidat, Al-Ghandoor, Phelan, Villalobos and Alkhalidi (2018) indicated that many aluminium producers have been assessing different potential reduction technologies that can be used as an alternative to the current Hall-Heroult technology. A number of deficiencies have been highlighted and considerations over the use of the Hall-Heroult technology have been identified by some aluminium researchers (Obaidat et al., 2018).

In South Africa, metal smelters are part of the big users of electricity (Donnelly, 2017). In order for the price of aluminium in the country to remain competitive on aluminium sport prices, smelters will require some discount prices from Eskom (Donnelly, 2017). However, Eskom has been under pressure in addressing its business growth, in order to remain sustainable in the midst of a stagnant economy. The increased use of aluminium in the automotive and beverage packaging industries and the need for aluminium in SA has positive long term prospects

(Donnelly, 2017). For example, the recent outcome of the renegotiated power supply contract with Eskom will determine whether Hillside Aluminium smelter in Richards Bay will continue to be a sustainable business for South Africa (Steyn, 2019). This is besides the potential job loss if the smelter is shutdown or if they cannot reach a favourable deal with Eskom on cost of electricity. In essence, there must be some form of working together between smelters and Eskom, in order to enable SA economy to experience the prospects of growing aluminium packaging which will in turn, affect the economy positively.

2.9 CONCLUSION

Industry leaders foresee and forecast that the metal packaging industry will continue in a positive direction particularly in SA, as more pressure is placed on the plastic packaging industry and the government to minimise plastic waste in the environment. The change from steel to aluminium beverage cans is a step in the right direction, even though the support of the government and industries in the midst of the slowed economy is required. This chapter reviewed literatures related to steel, aluminium, trends in the beverage can industries and economic impact of this change to SA economy. The next chapter presents the research methodology.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter outlined the literature review. This chapter presents the research methodology that was utilised for this study. The research methodology is a crucial area of a research, as it sets a logical and systematic approach utilised by the researcher in a particular study. This chapter presents the study objectives, research design and methods, paradigm of research, study setting and sampling approach. This chapter also assessed the construction of the research instrument (interview form), review of interviewees' feedback, analysis of feedback and ethical stance observed during this study.

3.2 STUDY OBJECTIVES

The study objectives for this research are as follows:

1. To assess the perceived economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry.
2. To explore the factors that drive the change from steel to aluminium cans within the packaging industry.
3. To assess how best the beverage packaging metal industry could improve the change process from steel to aluminium cans.

3.3 RESEARCH PARADIGM

The paradigm defines the positioning of the research and this influences every decision that the scholar makes during the study (Rehman & Alharthi, 2016). The research paradigm characterises the scholar's comprehensible outlook, as it covers the key decision that the scholar makes in course of the research process, including choice of methods and design method (Kivunja & Kuyini, 2017). The research paradigm helps in informing the researcher of the implications from the data and that the feedback will be constructed from the data that will be gathered. Some of the paradigms in research includes; empirical paradigms which covers positivism/

postpositivsm and antipositivism. The normative paradigm comprises of the interpretivism, social constructivism, criticisms/critical theory and pragmatism (Makombe, 2017). The qualitative research is interpretivist in nature as the analysis is recursive and never ending. A key feature of the interpretivist is that it is simply characterised as the view that “facts” are not things in some objective environment waiting to be uncovered, instead there are social constructions of individuals who capture the world via interpretive activity (Makombe, 2017). As a result, this study utilised the interpretivist paradigm because it is more of a naturalistic enquiry.

3.4 RESEARCH METHOD

This can be defined as an orderly action plant which helps in charting the researcher’s focus in a specific direction. The research methods chosen by a researcher enables them to carry out a systematic research, in order to generate superior results, conclusions and deductions from the study (Rehman & Alharthi, 2016). The researcher could either utilise the quantitative, qualitative or the mixed method. The quantitative method advocates that social happenings should be dealt with entities similar to physical scientists (Rehman & Alharthi, 2016). The nature of quantitative research provides a thorough measurement of something and it applies the numerical measurements and statistical evaluation of measurements to examine social phenomenal (Kenton, 2018).This method of research assess the correlation that exist among sets of variables using statistical estimation and is usually performed using survey forms and questionnaires (Sekaran & Bougie, 2013). Contrary, the qualitative research method needs some form of accessibility between the research and the participants, over a specified duration. According to Saunders, Lewis, and Thornhill (2012), qualitative research is usually associated with an expounding viewpoint, as the researcher needs to understand the subjective and constructed implications put forward by the participants in the research concerning the phenomenon being studied. The qualitative research approach makes use of the interpretivism paradigm, which deals with explaining a happening and extracting information that connects to the main topic (Saunders et al., 2015). Qualitative research methods are inductive in nature and centres principally on discovery and process (Sekaran & Bougie, 2013). The qualitative research method offers high level

of validity and are mainly not generalisation in style. It is also utilised when it is necessary in getting a deeper understanding.

This study utilised the qualitative research method in line with the selected research paradigm. This was used as the qualitative research method fits the objectives of the study, as it will enable in bringing information from the study that will address the perceived economic effect of changing from steel to aluminium beverage packaging cans. Again, limited study has been done in line with the research topic and objectives. Hence, the qualitative approach will help in setting the tone for a quantitative study in this area in the future.

3.5 RESEARCH DESIGN

Research design is known as an orderly plan of action that directs the researcher's effort. A good research design enables the researcher to carry out the study in a systematic manner in order to obtain quality results (Dinnen, 2014). It is also known as the framework and techniques chosen by the researcher to align different aspects of the research in an orderly manner (Bhat, 2018). A quality research design strategy helps the researcher to focus essential areas and time saving activities that will yield optimum result (Dinnen, 2014). These methods are described in the sections below.

3.5.1 Sampling Method

The degree of sampling done in a qualitative study is usually small in comparison to a quantitative study. According to Ritchie, Lewis and Elam (2013), samples for qualitative studies are usually small and additional samples sometimes does not lead to more information. Again, frequencies are usually not important in a qualitative study because one occurrence of data can be useful (Ritchie et al., 2013). Most times, qualitative evaluation is looking for meaning and not to merely highlight a general statement (Kivunja & Kuyini, 2017).

This study used purposive sampling method, also known as the judgemental sampling. Under this sampling method, there is a deliberate choice of a participant because of the unique qualities of the participant (Creswell & Creswell , 2018). In purposive sampling, the researcher decides on the participant based on their degree of exposure and experience on the key subject (Creswell & Creswell , 2018). By

exposure and experience, the researcher selected the participants based on their in-depth and wide knowledge of the packaging sector. These participants were familiar with the global trends and how far the SA sector has advanced in these areas, as well is how this transition would benefit the South African economy. A total of seven (7) participants were invited for participation and were selected from five (5) companies that are involved in aluminium beverage cans packaging.

3.5.2 Study Location

This study was conducted in South Africa but covered KwaZulu-Natal (KZN) and Gauteng Province, as the interviewees are located in those parts of South Africa.

3.5.3 Respondent List

The respondents were selected based on purposive sampling. The criteria for inclusion was dependent on their experience around the beverage can industry. The background of the participants is also beneficial to this study because of the level of their years of experience in the packaging environment. The table below shows the list of the participants that were selected to participate in this study.

Table 3-1: Interviewees List

Respondent	Gender	No of years in business
R1	Male	15
R2	Male	20
R3	Female	31
R4	Male	22
R5	Male	17
R6	Male	28
R7	Male	35

3.5.4 Research Instrument

The research instrument utilised for this study is an interview guide. The interview guide designed by the researcher titled “The economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry” was utilised for the study. The content and details of the interview guide are provided on the Appendix D.

3.5.5 Information and Feedback Collection

The gathering and collection of information from the interviewees took place in month of October 2019. The content of the interview forms was discussed with them individually and the forms were later sent to them for review. During the selected dates, the researcher interviewed the participants in their office in order to provide a comfortable environment. The pattern of the questions was open-ended. The researcher also ensured that the languages were easy understand, in order to ensure clarity and adequate feedback from the participants (Bryman, 2016).

3.6 PILOT STUDY

This can be defined as a small investigation that the scholar carries out with the aim of addressing potential gaps in the researcher instrument, which will also enable the scholar perform a wider study (Crossman, 2019). A vital advantage of the pilot study is that it helps the scholar to refine the interview questions, edit potential errors and to assess how long it takes each interviewee to complete the semi-structured interview. The pilot study was carried out on the first week of November 2019 and on two (2) interviewees. The essence of the pilot study was to evaluate the contents and flow of the questions.

3.7 DATA ANALYSIS

New researchers usually consider the evaluation and analysis of qualitative feedbak as perplexing and time consuming (Erlingsson & Brysiewicz, 2017). The analysis can also be considered difficult and painstaking, thereby demotivating the researcher (Erlingsson & Brysiewicz, 2017). Dudovskiy (2018) indicated that qualitative analysis can done through content analysis, narrative analysis, and

framework analysis. The framework analysis comprises of the thematic analysis. This study utilised the thematic analysis for information and feedback assesment. This approach involves identifying, analysing and outlining patterns (ususlly known as themes) within the feedback (Dudovskiy, 2018). Specific codes were used on key word, which are utilised as they are seen as a vital aspect of qualitative investigation (Sarantakos, 2012). During the analysis, the information was analysed and arranged into themes. These themes were further divided into sub-themes which led to a coding process. The data/feedbacks were looking for recurring themes or similarities in the data. The final stage of data analysis involved authentication, which comprises of re-checking the validity of these findings. This provided the researcher an opportunity to review previously attained conclusions.

3.8 ELIMINATION OF BIAS

The framework of qualitative studies presents a potential for bias to occur in course of the study by the researcher (Dudovskiy, 2018). More tactful scholars are cognisant of the fact that bias issues will usually arise in a research (Noble & Smith, 2015). The sources of bias could emanate from the participants or respondents. It could also come from the researcher. The approach for avoiding and eliminating can take place by the respondent not agreeing with the comments made by the researcher. In eliminating the bias from the respondents, the researcher can do this by desisting from asking leading questions. The researcher should also try not to assume that there is an association between their feelings and a behaviour from the respondent. The researcher followed the recommended approaches in ensuring that the research was free of bias.

3.9 RELIABILITY AND VALIDITY

Most times, a good number of reviewers have condemned qualitative research for not having robust scientific consistencies to justify approach applied to such research (Noble & Smith, 2015). It has also been argued that test measures that are typically utilised for measuring reliability and validity in quantitative research cannot be used for qualitative research (Noble & Smith, 2015). The approach to reliability in qualitative research revolves around exact replicability of the process and the corresponding outcomes (Leung, 2015). The definition of reliability in qualitative

research is contrary to intuition and sometimes perplexing. Therefore, the vital thing for reliability in qualitative studies focuses on consistency and dependability (Leung, 2015). For this study, the researcher ensured a sequential coherence between approaches to data collection and feedback evaluation to make sure there is reliability in course of the interview.

Validity in a qualitative study comprises of the relevance and suitability of the research instruments, processes and collected information or data (Noble & Smith, 2015). In this study, the researcher made certain that the chosen research methodology was the appropriate one. Efforts were also made to ensure that the sampling and data analysis were appropriate for the study.

3.10 ETHICAL REVIEW AND CONSIDERATION

Research ethics strongly affects the design of a research and engagement with people, objects and gathering of data in any research (Cooper & Schindler, 2011). Ethical application in research helps in safeguarding the participants such that no harm is done to them as a result of the research activities (Cooper & Schindler, 2011). Saunders, Lewis and Thornhill (2015) also agreed that lack of ethical application can result in negative issues, like wrong and defilement of non-disclosure agreements. Lack of ethical consideration could also destroy responders' privacy and lead to results misrepresentation. When such an incidence occurs, the research can be deemed as misleading people and devoid of legal implications (Saunders et al., 2015).

The research proposal was first submitted to University of KwaZulu-Natal (UKZN) research committee. Ethical clearance was granted by the research office prior to the start of the study. Gate keeper's letters were also obtained from all the companies covering all the six (6) participants. The researcher provided a consent form to the participants which was signed prior to the interview. This consent letter made the participants aware of their right to voluntarily exit the survey. The researcher also ensured that the confidentiality and anonymity of the participants were applied at all stages of the study.

3.11 CONCLUSION

The research methodology applicable to this study was reviewed in this chapter. This comprised of the research paradigm, research methods and research design. The study location, sample selection, research instrument design and analysis of the data were also included. Ethical considerations applicable to the study was also reviewed in this chapter. The next chapter presents the results and discussion based on the findings from the study.

CHAPTER 4
RESULTS, FINDINGS AND DISCUSSION OF FINDINGS

4.1 INTRODUCTION

The previous chapter reviewed the research methodology applicable to this study. This chapter presents the results and findings from this study. This chapter also covers the discussion of the study findings in view of the literatures. The context of this chapter revolves around the research questions and how the respondents' feedback addresses the research questions regarding the economic effects of changing from steel to aluminium beverage packaging metal cans within the packaging industry.

4.2 PARTICIPANTS

The semi-structured interview forms were distributed to seven (7) participants who covered five (5) different companies that are involved in beverage cans packaging. The feedback from the participating interviewees were written down and the feedback was provided via an electronic source. Majority of the participants have been in the industry for over fifteen (15) years. The selection of these participants was important as it was pertinent to have the views and contributions of experienced personnel's in the packaging industry.

4.3 THEMES AND SUB-THEMES

The findings from this study from the analysis carried out are provided in the nature of themes and sub-themes. These themes emerged from the predominant phrase on the interview questions, which were aligned to the study objectives. For instance;

a. The responses from the interviewees to each of the questions were listed in a tabular form.
b. The response to each of the questions were reviewed and analysed for similarities. These similarities ranges from phrases, statements, words and overall meaning.

c. The agreement or disagreement to each of these questions were also grouped in order to aid the discussion in the next chapter.

The Table 4-1 outlines the summary of the themes and sub-themes obtained from the data analysis.

Table 4-1: Summary of Themes and Sub-Themes

Main Themes	**Sub-Themes**
Economic effect of the change from steel to aluminium packaging	Benefits of the change from steel to aluminium packaging to the South African economy
	Right approach to effect this change for the benefit of the South African economy
	Benefits of this change to SMMEs that are aligned to beverage packaging companies
Factors affecting the change from steel to aluminium packaging	List of the factors affecting the change processes from steel to aluminium
	The impact of these listed factors on the process change from steel to aluminium
	Action taken to overcome the negative factors during the change from steel to aluminium
Improvement approach for beverage packaging industries to improve change to aluminium	Measures to be taken by beverage packaging industries to improve the change process from steel to aluminium

4.4 ECONOMIC EFFECT OF THE CHANGE FROM STEEL TO ALUMINIUM PACKAGING CANS

The feedback of the interviewees to this theme showed that there was a strong agreement by majority of them to the interview questions. Their feedback under each of the sub-themes relevant to the first research question are discussed below.

4.4.1 Benefits of the Change from Steel to Aluminium Packaging to the South African Economy

The response of the interviewees with regards to the benefits of the change from steel to aluminium packaging to the South African economy showed more agreement. Majority of the interviewees agreed that there were significant benefits of this change to the economy. Many of the interviewees had the following to say;

"Changing from steel cans to aluminium beverage cans has benefited SA economy, as the move aligned the local can industry with the rest of the global standards. This opened doors for SA can manufactures to export aluminium cans to markets like the USA" …R3

The response above is line with the view of Sawant (2019), which highlighted the growing trends of soft drinks in aluminium beverage cans. Majority of the industry is already showing growing trend on carbonated drinks, packaging for beer and energy drinks (Wood, 2019).

Other interviewees agreed that this change benefited the SA economy in terms of increasing recycling business activities, increased rate of producing beverage cans, created new job opportunities and created new business ventures. They had the following to say;

"Yes, Aluminium is 100% recyclable and environmentally friendly. With this change, beverage manufacturers were able to manufacture cans in a more efficient manner; in that they were able to manufacture cans at the very high speed compared to steel cans, thus almost doubling production rate. Furthermore, Aluminium cans are lighter

compared to steel cans and uses less coating. This reduced application and manufacturing cost drastically" …R1

"Yes. New business ventures were created through this change. There were deals that were signed by SA companies to supply the Aluminium rolled product with the can beverage can makers, to supply the aluminium that will be used to manufacture the aluminium cans" …R4

"Opportunities were realized for the local business in terms of supplying the new machineries/equipment that were needed for the upgrading of the plants. This has also opened the opportunity for other metal beverage can makers to make in road to the local metal beverage manufacturing industry, as other new two companies that are in the same industry have recently opened their plants as means of competing with Bevcan" ...R7

"Switching over to the aluminium cans would have increased the demand, thus boosting the industry which will in turn employ more people" …R5

It was stated in Hulamin (2018), that repackaging using aluminium beverage cans increases recycling business. According to Dagwa and Adama (2018), used aluminium cans are recycled and returned to a store shelf as a new can in a duration of eight weeks. This was also beneficial as only a small amount of energy is required for the reconversion into new aluminium, thereby indicating that recycling aluminium conserves higher valuable amount of energy and can be done without any loss on its original properties (Hulamin, 2018). Hence, the response of the interviewees agrees with literature which states that changing over to aluminium increases activities around recycling, thereby promoting such business ventures. Changing over from steel to aluminium beverage cans also increased new business ventures, as new equipment needed for the installation of new aluminium beverage cans were installed.

The responses of the interviewees agree with Kennedy (2017), who highlighted that utilising aluminium beverage cans creates new job opportunities. Hulamin (2018), highlighted that this change resulted in a serious capital investment by Hulamin, which covers new cleaning line and a recycling furnace. Thus, creating more job

opportunities. This view was further supported by Slater (2019), who stated that recycling of aluminium cans creates informal employment through entrepreneurial recycling endeavours. As the interviewees highlighted, the change resulted in more local deals. This implied that there was more room for trade in aluminium product category that are utilised for the manufacturing of aluminium based beverage cans (Ee, 2016).

However, one of the interviewees highlighted that this change resulted in a challenge for SA. This participant had this to say;

"Aluminium manufacture requires much more electricity to manufacture than steel for a country with the current electricity generation issues. Therefore, this has exposed our weakness as a country" …R6

SA has encountered various issues where it concerns power issues with regards to meeting the local demand. In South Africa, metal smelters are part of the big users of electricity (Donnelly, 2017). In order for the price of aluminium in the country to remain competitive on aluminium sport prices, smelters will require some discount prices from Eskom (Donnelly, 2017). As much as aluminium beverage packaging presents an opportunity for the SA economic growth, there is need for Eskom to rise up to the challenge for such prospect to remain sustainable and beneficial to the SA economy.

4.4.2 Right Approach to Effect this Change for the Benefit of the South African Economy

The interviewees' feedback on the right approach to effect the change to aluminium beverage packaging for the benefit of the economy varied, as they gave different views. Two of the interviewees had the following to say;

"A gradual process change at small scale could have been done, by first optimising one line that could have been converted in order to be able to manufacture the aluminium cans, to a point whereby they can meet the expected output before converting the second line. This would have given the engineers, management and

operators the opportunity to familiarize themselves with the new process and then use that experience when converting other lines. This might have enabled the beverage can manufacturer (like Bevcan) to be operating at full capacity by now" …R2

"I think if there were more people from South Africa that were trained to be more skilled in terms of engineering before the implementation of the change, this could have accelerated the completion of the change. These skilled people would have been using their skills at other local companies after completion of the change of steel can to aluminium can" …R5

The response from the interviewees disagrees with literature. This is because many of the beverage cans companies in SA began their changeover to aluminium from 2013 into 2015 (Hulamin, 2018). It was clear that many of the beverage can companies had a well thought out plan mapped out for the changeover, which included training some of their engineering and operations team overseas (De Ruyter, 2014). Ashkenazi (2019) further stated that some of the approaches applied by some companies was to first train their engineering and operations team overseas for this change over, before implementation locally. Nevertheless, it is possible that this was not done perfectly in all the companies which highlights the fact that this is a potential area for improvement in the future when such changes are to be implemented. Kennedy (2017) argues that some companies did not entirely do the changeover timeously, because of delayed planning and other internal factors.

In contrast, one of the interviewees stressed that the changeover was done in a professional manner. This respondent had this to say;

"The change was done in professional manner as there was no shortage of the metal beverage cans in South Africa during the period of implementing the project" …R7

This response agrees with literature as some of the companies like Nampak mapped out some initiatives in delivering this strategy (De Ruyter, 2014). The set up plans on assets covered recapitalisation, consolidation, and expansion. They also planned

for a clear operational excellence, service focus, quality of people; that is training their team and applying a “can do” marketing approach (De Ruyter, 2014). Nampak’s started their conversion to aluminium lines from 2013 into 2014 and completed them in 2015. Adjustments were made in their Sub-Saharan Africa international production lines in 2015 into 2016 (De Ruyter, 2014). The findings from this section showed that most of the companies prepared for the change while a few had some difficulties in changing over to aluminium packaging cans.

4.4.3 Benefits of this Change to SMMEs that are Aligned to Beverage Cans Packaging Companies

The response of the interviewees’ showed a strong agreement to the fact that the change to aluminium beverage cans benefited the local SMMEs that were involved in recycling. They had the following to say;

“With more than 70% of Aluminium cans being recycled, most of SMME benefited from collecting to smelting of these cans” …R1

“The collect a can is the main value add program that benefits the society and also recycling the aluminium waste that is generated from our processing of aluminium as Hulamin” ...R2

“More people have been employed by the SMME’s focusing on the recycling part. This has increased business growth to a certain level as the transporters of the scrap metal in the society are very much engaged in collecting the can for trading. This means more business growth for those transporting scrap as more loads are being transported” …R4

“It proactively introduced programs to support entrepreneurs interested in entering the aluminium value chain” …R5

“In percentage terms, Aluminium is recycled much more than steel, this created more opportunities for recycling businesses which are generally small/medium” …R6

“Given the current status of the economy in South Africa, the change has added value more to the SMME that are dealing with recycling” …R7

The feedback of the respondents agrees with literature. There are growing initiatives to encourage recycling programmes in order to move aluminium beverage cans to recycling centres for recycling, instead of ending up in landfills (Dagwa & Adama, 2018). Ideally, only about 5 percent of the energy required to generate new aluminium is needed to recycle scrap (used aluminium) back into a new aluminium (Hulamin, 2018). This further highlights the fact that recycling aluminium conserves valuable amounts of energy and can be done without any loss on its original properties (Hulamin, 2018).

In addition, recycling of aluminium creates business opportunities for many SMMEs in the country. According to Kennedy (2017), the impact of recycling aluminium beverage cans is worth more than $800 million dollars, as each year the aluminium industry pays out over $800 million dollars for empty aluminium cans. Certainly, this number would vary for different nations, depending on the level of aluminium business activity. In South Africa, between R100 million and R200 million a year will flow into the scrap metals and recycling industry as a result of the conversion from tin-plated steel cans to aluminium cans (Hancock, 2013). For instance, Hulamin recycles used beverage cans at their recycling facility in Pietermaritzburg and have commissioned a major recycling plant. This recycling plant will produce more jobs in the region which is a direct result of aluminium beverage cans recycling.

It is said that between 100,000 and 160,000 people are involved in activities around can recovery, thus earning a living or supplementing their income (Tablot, 2015). Other new entrepreneurs have been born as many collectors gather basic business skills and grow their own recovery and recycling businesses (Tablot, 2015). Hence, this study clearly shows that a major economic effect of changing from steel to aluminium beverage packaging cans is that there is business growth potential for SMMEs and a strong possibility for many indirect job creations.

4.5 THE FACTORS AFFECTING THE CHANGE FROM STEEL TO ALUMINIUM PACKAGING

The feedback of the interviewees to this theme showed that there were some agreements and disagreements to the interview questions. Their feedback under each of the sub-themes relevant to the first research question are discussed below.

4.5.1 List of the Factors Affecting the Change Processes from Steel to Aluminium

The response of the interviewees showed agreements with regards to their responses. Their feedbacks are reflected in the comments below;

"The first factor was global pressure towards using material that is environmentally friendly, second is cost effective, third is high quality material and aluminium is durable and it doesn't deteriorate with time" …R1

"Global competitiveness, and product innovation" …R2

"Upgrading of the skills and more capital investments" …R4

"Faster machinery and new designs or look of the can" …R5

New technology, global alignment and environmental awareness … R7

The feedback of the interviewees highlighted environmental awareness and friendliness as some of the factors driving the change to aluminium beverage cans. The focus on environmental friendliness of packaging materials has made aluminium packaging very advantageous for several economies. The initiatives to utilise products that are eco-friendlier is growing through many global beverage markets (Deaux & Yue Li, 2019). There is a strong emergence of aluminium as a more sustainable option to address the environmentally mindful consumers (Deaux & Yue Li, 2019). Hamilton (2019) alluded aluminium cans are strongly favoured to be more environmentally friendly because they are easily recyclable. Local trends have also shown that beverage companies are working on changing other products besides beverage cans to aluminium packaging (Nampak, 2019). However, a

contrary view recommends that in promoting the recyclability of aluminium, it is important not to exclude the awareness on the fact that it uses huge amounts of electricity and also have some chemical releases of greenhouse gas emissions (Onstad, 2019).

The growth in the aluminium market has also increased the global competitiveness, global alignment and innovation by many companies and economies. A report by Technavio, the world aluminium market size is expected to grow by 23.88 million tonnes between 2019 and 2023 (Technavio, 2019). Zhu and Cooper (2019) highlighted that analysts forecast the global Aluminium foil market to grow at a CAGR of almost 6 percent during the period 2019 to 2023. This makes the interest in aluminium a major focus. This further shows that the respondents' feedback agrees to existing literatures.

The feedback of the interviewees also showed that cost effectiveness of aluminium, quality and durability, were some of the factors affecting the changeover to aluminium beverage cans. Zhu and Cooper (2019) indicated that no other metal can be paralleled to the resourcefulness and popularity of aluminium because of its benefits. These benefits include, strength, lightweight, durability, corrosion resistivity, malleable, ductility, conductivity and odourless (Zhu & Cooper, 2019). Additionally, the value of adding new product lines and faster machinery equipment increases the competitiveness of local beverage can companies to other global players. This is also beneficial as it generates better value for the SA economy.

4.5.2 The Impact of the Listed Factors on the Process Change from Steel to Aluminium

This section assesses the effects of the listed factors on the process change from steel to aluminium. There were some valuable feedback based on the interviewees' feedbacks. The comments of the interviewees are shown below;

"Environmentally friendly – it is 100% recyclable. Cost effective – It is one of abundant and readily available metals and corrosion resistant. It requires less protective coating and it is recoverable/ recyclable. High Quality – It is durable and

material quality doesn't deteriorate with time which contributes on retaining the good taste of the content/product. Aluminium can last for a lifetime" …R1

"High recycling revenue for SMME's. Aluminium cans use different internal coating and the whole package (metal and coating) is less susceptible to corrosion attack, which is an advantage to the can manufacturing company" …R3

"New equipment being installed insures that there is capital investment being done which also improves the value of the company. Faster machinery leads to increased productivity as the new machinery will give a greater number of units manufactured on aluminium as opposed to traditional steel. The new look of the aluminium can does make the packing more attractive as it is brighter than the steel can" ... R5

"Globalization is part of the business strategies for companies to increase their profitability and their foot prints if they want to export and this change has opened that opportunity. Recycling is of the major components that can ensure that the global warming is reduced" …R7

The fact that aluminium is fully recyclable makes it very lucrative in utilising it for beverage cans. As already highlighted, it recyclability characteristic will increase the economics activities of many recycling SMMEs in the country, thereby increasing business activities within the manufacturing and recycling sector of the local economy (Hulamin, 2018). Local trends have also shown that beverage companies are working on changing other products besides beverage cans to aluminium packaging because of its environmental friendliness and recyclability (Nampak, 2019).

These factors are also important as the participants highlighted that they will increase global competitiveness and profitability for local beverage companies. For instance, many of the local companies are expanding rapidly into the rest of Africa. This creates an opportunity for them to tap into these markets in the developing economies. This is in line with the forecast on the world's aluminium market that is expected to grow by 23.88 million tonnes between 2019 and 2023 (Technavio, 2019). Increased competitiveness will also result in profitability of these companies,

which will also increase activities in the manufacturing sector of the local economy, thereby contributing to the GDP.

4.5.3 Actions Taken to Overcome the Negative Factors During the Change from Steel to Aluminium

This section assesses the potential negative effects that occurred during the change over from steel to aluminium, and how these changes were managed to maintain a smooth changeover. The interviewees made the following comments;

"More highly skilled personnel were invited to help with the implementation of the project" …R2

"Continuous training of operations team on the better manufacturing techniques and practices" …R4

The responses from the interviewees agreed with literature. Many of the aluminium beverage can producers had a well thought out plan for the changeover, in order to address potential negative factors. Part of this plan included the training of their engineering and operations team overseas (De Ruyter, 2014). Ashkenazi (2019) further stated that some of the methods applied by some companies was to first train their engineering and operations team overseas for this change over, before implementation locally. To ensure the sustainability of this change, local producers continued with team training and empowerment, in order to sustain the dynamics around the current aluminium industry trends and related process change.

Another interviewee indicated that better preparation and planning utilised by some of the local producers in addressing potential challenge was effective communication in their organisation and value chain. This interviewee made the comments below;

"More effective communication strategy was implemented" ...R5

The current business environment requires organisations and teams that can adapt to change. However, the rate of change and the lack of success in implementing change can result in the change management process becoming overwhelming. Heathfield (2019) stated that it is wrong to initiate communication at the verge of change. Adequate change management requires proactive communication that is aimed at carrying all the employees along (Heathfield, 2019). Hasanaj and Manxhari (2017) argued that a major approach to overcoming resistance of workers to change is to inform the workers in advance. Employees and workers need to be informed on when the change is expected to occur, how it will actioned, what is expected of them, how they will be affected from the change with regards to their jobs and how the firm will sustain and motivate them going forward (Hasanaj & Manxhari, 2017). In implementing this change, local aluminium companies in their approach endeavoured to set up an action committee during the changeover to aluminium (CSIR, 2017). This is clearly in line with the respondent's feedback, who indicated that a clear and effective communication strategy was put in place before the changeover.

4.6 IMPROVEMENT APPROACH FOR BEVERAGE PACKAGING INDUSTRIES TO IMPROVE CHANGEOVER TO ALUMINIUM

The feedback of the interviewees to this theme showed several optimisation approach that can be taken by beverage can producers on improving the changeover to aluminium. The feedback under the only sub-theme is presented below.

4.6.1 Measures to be taken by Beverage Packaging Industries to Improve the change process to aluminium

The response of the interviewees provided diverse feedbacks on the measures to be taken to improve beverage can industries. Their feedbacks are reflected in the comments below;

"It is important for the beverage metal packing can industry in South Africa to align itself with global players within the same market in order to stay competitive globally.

This will mean they need to have some technical agreements with other role players to keep the technology evolving" …R2

"Keep on with developing new products and keep aligned with global players" …R7

The feedback of the interview above showed that cooperation and some level of partnership with global players are required to improve the process changeover from metal tin to aluminium. There is need for local SA companies to explore some sort of technical partnerships with most of the global players. This will also enable these businesses to remain competitive in the global stage with regards to aluminium beverage cans advancement.

Other interviewees had the following to say;

"Continuous training of personnel in terms of optimizing production and keeping up with new technologies" …R4

"Look into sourcing aluminium at competitive price, in order to ensure that aluminium remains in the market and can be preferred packaging tool over plastic and paper" …R5

"Make processes more efficient for local companies to compete globally, invest more in recycling campaigns, as this is the only way that they can reduce the cost of aluminium. Invest in research into more energy-efficient methods of producing aluminium" …R6

As highlighted by some of the respondents, continuous training is paramount for local beverage can companies. This is to continuously improve the aluminium beverage cans industry. This plan includes a continuous training of the engineering and operations team overseas (De Ruyter, 2014). Another view stated that it is necessary to train local teams before a changeover and to maintain these learnings by applying the continuous learning approach (Ashkenazi, 2019).

4.7 CONCLUSION

The main aspect of this chapter is to review the findings, and the discussion of findings from the interviewees. This chapter grouped the findings into themes and sub-themes, which enabled the categorisation of sections in this chapter. Additional

discussion on the findings of the study, based on each of the objectives will be discussed in the next chapter. The next chapter presents the study findings, conclusions and recommendations.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The previous chapter reviewed the results and findings gathered from the study. It also evaluated them and discussed them in line with the literature. In this last chapter, the study conclusions and recommendations from the study are outlined with the goal of indicating whether they addressed the research questions. This chapter also outlines the opportunities for further study as well as the limitations of the study. This study was carried out in view of the objectives below:

1. To assess the perceived economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry.
2. To explore the factors that drive the change from steel to aluminium cans within the packaging industry.
3. To assess how best the beverage packaging metal industry could improve the change process from steel to aluminium cans.

5.2 FINDINGS AND OUTCOMES FROM THE STUDY

This section is divided into three sections and comprises of the study findings under each of the study objectives.

5.2.1 To assess the perceived economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry

In this section, the study assessed the perceived economic effect of changing from steel to aluminium beverage cans in SA. The findings from the study showed that there is a growing trend on carbonated drinks that are packaged with aluminium beverage cans. Global trends showed an increase in the use of aluminium beverage cans, which is the similar observation locally that is increasing the business activities for repackaging manufacturing industries (Wood, 2019). The interviewees clearly highlighted that the switch to aluminium beverage cans have increased in demand

locally and is also creating more employment in the country. A major aspect of the positive boost observed from this study is in relation to recycling business. Feedback from the participants uncovered that there is a growth in the promotion of business ventures around recycling. Kennedy (2017) clearly stated that utilising aluminium beverage cans creates job opportunities in the recycling sector. A good number of SMMEs involved in the recycling business are increasing in their business activities due to the recyclable characteristics of aluminium beverage cans. More rooms for trade in aluminium product category, especially in the beverage industries are forecasted (Ee, 2016). In addition, the interviewees also showed that this positive trend further exposes the electricity provider Eskom, as aluminium requires a substantial amount of electricity in its production. It was suggested by the respondents that there is the need for Eskom to rise up to the challenge of meeting growing electricity demand, such that the economic prospect from aluminium packaging will benefit the local economy.

In terms of the approach applied during the changeover to aluminium towards the improvement of the economy, the interviewees highlighted that the local companies invested in required trainings before the changeover. This study showed that the beverage can companies had a clearly mapped out plan for the changeover, which included training some of the engineering and operations teams overseas (De Ruyter, 2014). Ashkenazi (2019) supported this statement as it was stated that the local companies first trained their teams before the implementation of this change. This study also showed that some encountered delays due to other internal factors. It was also highlighted that a good number of the local companies made plans on new assets for expansion, as new equipment product lines that are compatible with the aluminium beverage cans had to be assembled. For example, it was clearly highlighted by the interviewees that Nampak made adjustments in their rest of Africa production lines from 2015 into 2016, even though their local changeover began from 2013 (De Ruyter, 2014). In essence, the study findings showed that local companies were ready for the changeover to aluminium beverage cans.

This study additionally showed that another economic effect of changing to aluminium beverage packaging cans was the increased growth in the recycling sector of SA. Kennedy (2017) explained that the impact of recycling aluminium

beverage cans is worth more than $800 million dollars, which are paid out for recycling. It was uncovered that in SA, between R100 and R200 million rand will flow into the scrap metals and recycling industries (Hancock, 2013). For example, Hulamin, which recycles beverage cans has commissioned new facilities in Pietermaritzburg that has been forecasted to produce more jobs in the region (Hulamin, 2018). In view of the current unemployment rate and unsteady rate in the manufacturing section, utilisation of aluminium beverage cans creates a big economic benefit for the local economy.

5.2.2 To explore the factors that drive the change from steel to aluminium cans within the packaging industry

The feedback from the interviewees showed that the growing concern across the globe around environmental preservation and friendliness were some of the factors that necessitated the change to aluminium beverage cans. The growing trend on environmental friendliness of packaging materials has made aluminium packaging very advantageous for several economies. The initiative of utilising products that are eco-friendlier is growing through many global beverage markets (Deaux & Yue Li, 2019). Various investigations have also classified the emergence of aluminium as a more sustainable option in addressing the environmentally mindful consumers. This study also uncovered that the increasing global competitiveness, alignment and innovation by many economies were also driving the change from steel to aluminium packaging cans. Analysis of various views has forecasted a growth in the global aluminium foil market (Zhu & Cooper, 2019). SA as player in the global market and among the developing economies has embraced this change, in order to remain competitive in the industry locally. The need to grow in terms of exports for more competitiveness is also driving local companies in following in this trend, which ultimately affects the SA economy. The cost effectiveness of aluminium, quality and durability were also highlighted by the interviewees as some of the factors driving the change from steel to aluminium beverage cans. Previous research and studies have shown that no other metal can be likened to the resourcefulness and popularity of aluminium because of its diverse benefits (Zhu & Cooper, 2019).

This study further identified the impact of the highlighted factors driving the change from steel to aluminium. For instance, it was uncovered that the recyclability of aluminium makes it very lucrative for utilisation as beverage packaging cans. The fact that new companies are being born out of the recyclability of aluminium beverage cans increases growth in the SMMEs sector. Local trends have also shown that beverage companies are working on changing other products besides beverage cans to aluminium packaging because of environmental friendliness and recyclability (Nampak, 2019). In addition, the increased competitiveness of aluminium hugely affects business profitability in these companies, thereby increasing activities in the manufacturing sector for the benefit of the South African economy. It was also showed that these companies strategically prepared for the changeover, in other to withstand potential negative outcomes during the transition.

5.2.3 To assess how best the beverage packaging metal industry could improve the change process from steel to aluminium cans

This section assessed how best the local beverage companies could improve the change process from steel to aluminium beverage cans. The feedback from the study uncovered that business cooperation and partnership with global aluminium technical firms are required to improve changeover from metal tin to aluminium. It was highlighted that there is the need for local companies to explore these kinds of partnership, as this will also enable these companies to remain competitive at the global scene. The findings from the interviewees feed also showed that continuous training will remain paramount for local beverage can companies in order to consistently improve the aluminium beverage can industries. De Ruyter (2014) stated that such plans should include a continuous training of the engineering and operations team overseas. To buttress this point further, Ashkenazi (2019) highlighted that this change over can be sustained by clearly mapped out skills improvement for the local team periodically.

5.3 STUDY CONCLUSIONS

The following conclusions can be drawn from this study.

a. The study concluded that there were a number of economic effects and benefits of changing from steel to aluminium beverage packaging cans.
b. The study showed that there is a growing trend on carbonated drinks that are packaged with aluminium beverage cans and that the benefit of this trend is increasing business activity in the aluminium packaging industry locally.
c. The study uncovered that the change has improved the global competitiveness of the local companies, thereby making them more agile to compete on the global stage.
d. It was concluded from the study that the aluminium beverage cans packaging industry is creating jobs for the local economy in the area of recycling.
e. The study also uncovered that new small businesses and SMMEs are being birthed as a result of the growing recycling business activities, which makes aluminium very desirable in comparism to other metals.
f. The study uncovered that global competitiveness, environmental friendliness, cost effectiveness of aluminium, quality and durability are some of the factors driving the change in many economies from steel to aluminium beverage cans.
g. The change from steel to aluminium was successful due to implemented measures like training of engineering and operations team, effective communication by management of many of the local industries.
h. It was also uncovered that the current global trends in the aluminium sector will increase the economic activities in SA as a whole, as well as inspiring more business energy in the manufacturing sector.

5.4 STUDY RECOMMENDATIONS

The recommendations from the study are as follows;

1. A review in the electricity sector that is linked is paramount, as the local aluminium manufacturing sector which depends largely on electricity will not be interrupted in remaining sustainable.

2. It is recommended for the SA economy to leverage more on potential of beverage packaging industry because of the untapped economic value it adds in terms of job creation.
3. Further statistical study should be carried out that will help in quantifying how cost effectiveness of aluminium, quality and durability drive the change from steel to aluminium in SA.
4. It is recommended that continuous period training of engineering and operational team of aluminium beverage can plants be maintained. This is in order to sustain existing new local plans and maintain production sites optimisations.
5. It is essential for these local beverage cans companies to continue to seek for potential technical alliance and technical partnership in the future, as this will maintain their technology band and create more innovation in their business value chain.

5.5 STUDY LIMITATIONS

This study was carried out in South Africa and focused on four local beverage cans manufacturer which include; Bevcan, Hulamin, MetPac and Valspar. This study is restricted to these companies and the findings from this study cannot be applied to other companies.

5.6 SCOPE FOR FURTHER STUDY

It is suggested that future studies should be considered and done using the quantitative method of study under the same topic. Additionally, other studies can be conducted that looks at some numerical estimation of the growth of aluminium beverage packaging within SA, how it has affected the revenues of the local companies and details of how it has added to the nations GDP growth.

5.7 CONCLUSION

The findings from the study, conclusions drawn from this study and the recommendations were presented in this chapter. This chapter also outlined the limitations from the study and suggestions for future study. The use of aluminium

beverage cans is a growing trend that is affecting many national economies positively. It is forecasted that this trend will continue to grow and creates opportunities for local companies to tap into it, such that more benefit will be seen in the South African economy. The researcher considers this study a valuable study and believes that further studies should be explored as suggested.

REFERENCES

Arthur, R., 2018. *South Africa introduces sugar tax.* [Online] Available at: https://wwwbeveragedaily.com [Accessed 19 July 2019].

Ashkenazi, D., 2019. How aluminium changed the world: A metallurgical revolution through technological and cultural perspectives. *Technological Forecasting and Social Change,* 143(2), pp. 101-113.

Bhat, A., 2018. *Research Design: Definition, Characteristics and Types.* [Online] Available at: https://www.questionpro.com/blog/research-design/ [Accessed 3 April 2019].

Bryman, A., 2016. *Social Research Methods.* 5th Edition ed. London: Oxford University Press.

Burns, S., 2015. *Power Costs in the Production of Primary Aluminium.* [Online] Available at: https://www.agmetalminer.com [Accessed 30 October 2019].

Cerasa, A. & Buscagalia, D., 2019. A hedonic model of import steel prices: Is the EU market integrated?. *Resource Policy,* 61(2), pp. 241-249.

Cooper, D. & Schindler, P. S., 2011. *Business Research Methods.* 11th Edition ed. Melbourne: McGraw-Hills.

Creswell, J. W. & Creswell , D. J., 2018. *Research design: qualitative, quantitative, and mixed methods approaches.* 5th ed. Los Angeles: SAGE.

Crossman, A., 2019. *What Is a Pilot Study in Research?.* [Online] Available at: https://www.thoughtco.com [Accessed 30 September 2019].

CSIR, 2017. *The South African Aluminium Industry Roadmap.* [Online] Available at: https://www.afsa.org.za [Accessed 11 October 2019].

Dagwa, I. M. & Adama, K. K., 2018. Property evaluation of pumice particulate-reinforcement in recycled beverage cans for Al-MMCs manufacture. *Journal of King Saud University - Engineering Sciences,* 30(1), pp. 61-67.

De Ruyter, A., 2014. *2014 Investor Day - Bevcan Springs and Glass.* [Online] Available at: https://www.nampak.com/ [Accessed 14 October 2019].

Deaux, J. & Yue Li, Y., 2019. *Aluminum is replacing plastic as the greenest bottle.* [Online] Available at: https://www.bloomberg.com/ [Accessed 28 October 2019].

Dejonckheere, M. & Vaughn, L. M., 2019. Semi-Structured Interviewing in Primary Care Research: A Balance of Relationship and Rigour. *Journal of Family Medicine and Community Health,* 7(2), pp. 121-131.

Department of Trade and Industry, 2017. *The South African Aluminium Industry Roadmap,* Johannesburg: Department of Trade and Industry (DTI) Republic of South Africa.

Department of Trade and Industry, 2018. *Presentation to the portfolio committee on trade and industry,* Johannesburg: Department of Trade and Industry.

Dinnen, J., 2014. *Clearly Define Your Research Strategy.* [Online] Available at: https://www.mackenziecorp.com/phase-2-clearly-define-research-strategy/ [Accessed 15 November 2018].

Donnelly, L., 2017. *Can Eskom woo the big spenders?.* [Online] Available at: https://www.mg.co.za/ [Accessed 28 October 2019].

Dudovskiy, J., 2018. *The Ultimate Guide to Writing a Dissertation in Business Studies: A Step-by-Step Assistance.* 1st ed. Leeds: Oxford Publishers.

Ee, C. Y., 2016. Export-led Growth Hypothesis: Eprical Evidence from Selected Sub-Saharan African Countries. *Procedia Economics and Finance,* 35(3), pp. 232-240.

Engineering News, 2017. *Converting from Steel to Aluminium Beverage Cans Bears Fruit for SA's Metals Packaging and Recycling Industries.* [Online] Available at: https://www.engineeringnews.co.za [Accessed 29 October 2019].

Erlingsson, C. & Brysiewicz, P., 2017. A hands-on guide to doing content analysis. *African Journal of Emergency Medicine,* 7(3), pp. 93-99.

Flick, U., 2018. *Designing Qualitative Research.* 2nd ed. London: SAGE Publications.

Garczyńska, M., 2015. *Aluminium recycling and the regulatory landscape,* Madrid: European Aluminium.

Hamilton, S., 2018. *Are cans more environmentally friendly than bottles?.* [Online] Available at: https://www.irishtimes.com [Accessed 19 October 2019].

Hancock, T., 2013. *Conversion to aluminium beverage cans to facilitate job creation.* [Online] Available at: https://www.engineeringnews.co.za [Accessed 15 July 2019].

Hasanaj, R. & Manxhari, M., 2017. Importance of communicating during change: A case of the municipality of Vlora. *European Journal of Multidisciplinary Studies,* 4(1), pp. 15-19.

Heathfield, S. M., 2019. *Communication in Change Management.* [Online] Available at: https://www.thebalancecareers.com [Accessed 18 September 2019].

Hoque, M. Z., Alam, N. M. & Nahid, K. A., 2018. Health consciousness and its effect on perceived knowledge, and belief in the purchase intent of liquid milk: Consumer insights from an emerging market. *Journal of Foods MDPI,* 150(7), pp. 1-21.

Hulamin, 2018. *Why Recycle Aluminium?.* [Online] Available at: https://www.hulamin.com/about/recycling/why-recycle-aluminium [Accessed 11 September 2019].

Industrial Development Corporation, 2018. *Trade analysis: Potential risks for South Africa's steel and aluminium industries arising from the imposition of tariffs on US imports of steel and aluminium,* Pretoria: Department of Research and Information - IDC.

Industrial Development Corporation, 2019. *Economic overview: Recent developments in the global and South African economies,* Pretoria: Department of Research and Information - IDC.

Kennedy, M., 2017. *Aluminium cans recycling.* [Online] Available at: https://www.wastecare.com/Articles/Aluminum_Cans_Recycling.htm [Accessed 5 July 2019].

Kenton, W., 2018. *Population.* [Online] Available at: https://www.investopedia.com/ [Accessed 21 January 2019].

Kivunja, C. & Kuyini, A. B., 2017. Understanding and Applying Research Paradigms in Educational Contexts. *International Journal of Higher Education,* 6(5), pp. 26-41.

KwaZulu-Natal Provincial Treasury, 2018. *Trade tension and its implications to the global trade ane economic climate,* Pietermaritzburg: Province of KwaZulu-Natal Provincial Treasury.

Leung, L., 2015. Validity, reliability, and generalizability in qualitative research. *Journal of Family Medicine and Primary Care,* 4(3), pp. 324-327.

Liedtke, S., 2018. *2018 brings renewed optimism for South African stainless steel industry.* [Online] Available at: https://www.engineeringnews.co.za [Accessed 15 September 2019].

Makgetla, N., 2017. The crisis at Eskom and industralisation. *Trade and Industry Policy Strategies*, 2 November, pp. 1-27.

Makombe, G., 2017. An expose of the relationship between paradigm, method and design in research. *The Qualitative Report - TQR,* 22(12), pp. 3363-3382.

Metalworking News, 2015. *Nigerian can manufacturer takes on Nampak with South African factory.* [Online] Available at: https://www.metalworkingnews.info [Accessed 11 September 2019].

Moodley, N., 2019. *Steel's global growth.* [Online] Available at: https://www.businessmediamags.co.za [Accessed 11 August 2019].

More, A., 2019. *Ion and Steel market 2019 global industry trends, share, size, demand, growth opportunities, industry revenue, future and business analysis by forecast - 2023.* [Online] Available at: https://www.marketwatch.com [Accessed 2 August 2019].

Nampak, 2019. *Nampak offers aluminium and carton alternatives to plastic packaging.* [Online] Available at: https://www.averda.co.za/ [Accessed 15 September 2019].

Noble, H. & Smith, J., 2015. Issues of validity and reliability in qualitative research. *British Medical Journal,* 18(2), pp. 34-35.

Obaidat, M. et al., 2018. Energy and exergy analyses of different aluminium reduction technologies. *Sustainability,* 10(2), pp. 1-21.

Omarjee, L., 2018. *SA granted US tariff exemptions on some steel and aluminium products.* [Online] Available at: https://www.fin24.com [Accessed 11 September 2019].

Onstad, E., 2019. *Plastic bottles vs. aluminum cans: who'll win the global water fight?.* [Online] Available at: https://www.reuters.com/ [Accessed 31 October 2019].

Ralph 2, L., 2018. *SA Metal Packaging Industry Poised for Growth.* [Online] Available at: https://www.packagingsa.co.za [Accessed 11 August 2019].

Ralph, L., 2017. *Converting from steel to aluminium beverage cans bears fruit for SA's metals packaging and recycling industries.* [Online] Available at: https://www.packagingsa.co.za [Accessed 2 October 2019].

Reed, B., 2019. *Steel Industry Trends.* [Online] Available at: https://www.fairlawntool.com [Accessed 11 July 2019].

Rehman, A. A. & Alharthi, K., 2016. An Introduction to Research Paradigms. *International Journal of Educational Investigations,* 3(8), pp. 51-59.

Ritchie, M., Lewis, J., Nicholls, C. M. & Ormston, R., 2013. *Qualitative Research Practice: A guide for Social Science Students Researchers.* 2nd ed. London: Sage Publications.

Rosenblatt, S., 2019. *2019 Packaging Outlook: Metal Can Packaging.* [Online] Available at: https://www.packagingstrategies.com [Accessed 5 June 2019].

Sarantakos, S., 2012. *Social Research.* 4th Edition ed. Wales: Wales Publishers.

Saunders, M., Lewis, P. & Thornhill, A., 2015. *Research Methods for Business Students.* 7th Edition ed. London: Pearson.

Sawant, A., 2019. *Beverage cans market 2019 global size, share, trends, top manufacturers, key players analysis and opportunity assessment by 2023.* [Online] Available at: https://www.marketwatch.com [Accessed 4 July 2019].

Sedov, A., 2018. *Overview of the Steel and Iron Ore Market,* Moscow: Deloitte CIS Research Centre.

Sedov, A., 2019. *Overview of the steel and iron ore market,* Moscow: Deloitte CIS Research Center.

Sekaran, U. & Bougie, R., 2013. *Research Methods for Business: A Skill-Building Approach.* Chichester, West Sussex: John Wiley & Sons Ltd.

Singh, K., 2018. *Metal packaging market share shrinks, but collection rate grows.* [Online] Available at: https://www.bizcommunity.com [Accessed 10 July 2019].

Slater, M., 2019. *Sustainable and chic: The drive towards offering more beverage in cans is gaining momentum.* [Online] Available at: https://www.m.food24.com [Accessed 21 September 2019].

Stacey, N. et al., 2019. Sugar-based beverage taxes and beverage prices: Evidence from South Africa's Health Promotion Levy. *Social Science and Medicine,* Volume 238, pp. 1-8.

Steenhoff-Snethlage, E., 2018. *Record-high margins for aluminium sales.* [Online] Available at: https://www.engineeringnews.co.za [Accessed 27 October 2019].

Stewart, R., Niero, M., Murdock, K. & Olsen, S. I., 2018. Exploring the implementation of a circular economy strategy: the case of a closed-loop supply of aluminium beverage cans. *CIRP Life Cycle Engineering (LCE) Conference*, 2 May, pp. 810-815.

Steyn, L., 2019. *New power supply deal critical to the Hillside smelter's survival.* [Online] Available at: https://www.businesslive.co.za [Accessed 2 November 2019].

Tablot, J., 2015. *IWMSA Small Waste Contractors Seminar.* [Online] Available at: https://www.iwmsa.co.za/ [Accessed 30 October 2019].

Technavio, 2019. *Global Aluminium market 2019 to 2023.* [Online] Available at: https://www.technavio.com [Accessed 1 October 2019].

Tisza, M. & Czinege, I., 2018. Comparative study of the application of steel and aluminium in lightweight production of automotive parts. *International Journal of Lightweight Materials and Manufacture,* 1(4), pp. 229-238.

Winning, A., 2018. *US grants SA some exemptions from tariffs.* [Online] Available at: https://www.businesslive.co.za [Accessed 15 October 2019].

Wood, L., 2019. *Global metal packaging market outlook report 2019-2024: Increasing adoption of green packaging solutions drives growth.* [Online] Available at: https://www.businesswire.com [Accessed 15 July 2019].

Zhu, Y. & Cooper, D. R., 2019. An optimal reverse material supply chain for U.S Aluminium scrap. *Procedia CIRP,* 80(3), pp. 677-682.

APPENDIX A

Gatekeeper Letter

Nampak Bevcan Rosslyn
75 Dodds Street
Rosslyn
Gauteng Province
0200

01 November 2018

Attention: University of KwaZulu-Natal
School of Business Leadership
Durban, Westville Campus

Re: Dissertation by Cecil Nzimande (student no. 215081343)

This is to confirm that Cecil Nzimande will be helped with relevant information that he may need in order to fulfill his Master of Business degree dissertation.

It is with the understanding that all data collected in this study will be confidential and will be used only for this study.

Regards

[redacted]

Thanks in advance

Kingsley Nemudivhiso
General Manager
Bevcan Rosslyn
Nampak Bevcan
Choose CANS
Direct +27 (0)12 521 9002 | Mobile + 27 (0)83 200 0209 | Email Kingsley.Nemudivhiso@nampak.com

HULAMIN
ROLLED PRODUCTS

Edendale Road
Pietermaritzburg
3201

To: University of KwaZulu Natal
School of Business Leadership

Date: 22 August 2018

Re: Cecil Nzimande (student no. 215081343) – MBA assistance

Hulamin LTD advises that it will engage with the above-mentioned student from UKZN by allowing the student to access information he may require in order to assist him to fulfill his Master of Business.

Regards

[redacted]

Mr Senzelwe Mate
Technical Sales Representative
Tel.:
Cell: [redacted]

HULAMIN OPERATIONS
Proprietary Limited
P.O. Box 74
Pietermaritzburg, 3200

Bottles Direct (PTY) LTD
011 026 3864
info@bottlesdirect.co.za
bottlesdirect.co.za

Company Registration Number: 2017/372456/07
Standard Bank Cheque: 28 28 26 076
Standard Bank Branch: 014 845

Tax Number: 9243152189
VAT Number: 4820 266 37 9

P O Box 25240
Gezina
0031

Unit 3 & 3, 9 Belgrade Street
Spartan, Kempton Park
1619

14 September 2018

Attention: University of KwaZulu-Natal

School of Business Leadership

Durban, Westville Campus

Re: Dissertation by Cecil Nzimande (student no. 215081343)

This is to confirm that Bottles Direct the manufacturer of plastic bottles packaging coatings agree to help Cecil Nzimande with relevant information that he may need in order to fulfill his Master of Business degree dissertation.

It is with understanding that all data collected in this study will be confidential.

CERTIFIED A TRUE EXTRACT

[redacted]

COMPANY OWNER(Managing Partner)

METPAC-SA
Driving Sustainable Metal Packaging

+27 (0) 82 880 9580
+27 (0) 31 785 1019
ceo@metpacsa.org.za
www.metpacsa.org.za

Attention: University of KwaZulu-Natal

School of Business and Leadership

Durban, Westville Campus

Re: Dissertation by Cecil Nzimande (student no. 215081343)

This is to confirm that **MetPac SA** agree to help Cecil Nzimande with relevant information that he may need in order to fulfill his Master of Business degree dissertation.

It is with the understanding that all data collected in this study will be confidential and will be used only for this study and will be available to **MetPac SA** if required on completion of the dissertation.

Regards

[redacted]

Kishan Singh
CEO MetPac-SA
[redacted]

SHERWIN-WILLIAMS.
Packaging Coatings

Sherwin-Williams Company (South Africa)
P O Box 13052, Jacobs, 4026
255 Lansdowne Road, Jacobs, 4052

Phone: +27 (0) 31 4598426
Fax: +27 (0) 31 4688912
Registration No. 1959-001105-07

18 August 2018

Attention: University of KwaZulu-Natal
School of Business Leadership
Durban, Westville Campus

Re: Dissertation by Cecil Nzimande (student no. 215081343)

This is to confirm that Sherwin-Williams (Valspar SA) the manufactures of the metal packaging coatings agree to help Cecil Nzimande with relevant information that he may need in order to fulfill his Master of Business degree dissertation.

It is with understanding that all data collected in this study will be confidential.

Regards

[redacted]

Fortune Nsibande
Plant Manager

The VALSPAR (South Africa) Corp (PTY) LTD
Reg No.: 1959/001105/07
P.O. BOX 13052, JACOBS 4026
255 LANDSDOWNE ROAD, JACOBS 4052
TEL: 031-459 8400 FAX: 031-468 8912

APPENDIX B

Informed Consent

Informed Consent Letter

UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

MBA Research Project
Researcher: Cecil M Nzimande ([redacted])
Supervisor: Dr Emmanuel Mutambara (031 260 8104)
Research Office: Ms P Ximba (031 260 3587)

Dear Respondent,

I, Cecil Mlungisi Nzimande a Masters of Business Administration Student at the Graduate School of Business and Leadership, of the University of Kwa-Zulu Natal. You are invited to participate in a research project entitled: The economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry.

Through your participation I hope to understand the economic effects of changing from steel to aluminium beverage packaging metal cans within the packaging industry in South Africa. The results of the interview are intended to assist in understanding the benefits, how it was successfully implemented and factors that contributed to the success. Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this interview. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, UKZN.

If you have any questions or concerns about completing the interview or about participating in this study, you may contact me or my supervisor at the numbers listed above.

The interview should take you about 45-60 minutes to complete. I hope you will take the time to participate in the interview.

Sincerely

Investigator's signature_____Date_____

This page is to be retained by the participant

APPENDIX C

Interview Guide

Research Topic: The economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry.

1. **To assess the economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry.**

   a) Do you think the change from steel to aluminium benefited the SA economy? Please explain.

   b) How could the change have been done to improve the economy?

   c) What values and benefits does this change add to SMMEs that are working and aligned with your company?

2. **To explore the factors that drive the change from steel to aluminium cans within the packaging industry**

   a) Could you please outline the factors that affect the change processes from steel to aluminium can within the packaging industry?

   b) Explain to me how each of these factors you outlined above affect the process change?

   c) What was done in order to overcome the negative factors during and after the change from steel to aluminium?

3. **To assess how best the beverage packaging metal industry could improve the change process from steel to aluminium cans.**

   a) What measures can be taken by the beverage packaging metal can industries to improve the change process from steel to aluminium?

APPENDIX D

Turnitin Report

Turnitin Originality Report

- Processed on: 21-Nov-2019 9:24 AM CAT
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- Submitted: 1

The Economic Effect of Changing from Steel to Aluminium Beverage Packaging Metal Cans within the Packaging Industry By Cecil Nzimande

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Submitted to Erasmus University of Rotterdam on 2019-09-04
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https://www.bendbulletin.com/business/7507291-151/aluminum-is-replacing-plastic-as-greenest-for?referrer=section
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Submitted to University of KwaZulu-Natal on 2019-06-18
< 1% match (Internet from 27-Sep-2018)
https://www.thedti.gov.za/parliament/2018/SA_Steel.pdf
< 1% match (publications)
Andrea Cerasa, Daniela Buscaglia. "A hedonic model of import steel prices: Is the EU market integrated?", Resources Policy, 2019
< 1% match (student papers from 29-Apr-2019)
Submitted to Westcliff University on 2019-04-29
< 1% match (Internet from 29-Oct-2019)
https://elamal-news.com/metal-packaging-market-2019-2024-latest-industry-updates-projections-consumption-analysis-investment-cost-profits-data-forecast-to-2024/1631

APPENDIX E

Ethical Clearance Approval

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

10 December 2018

Mr Cecil Mlungisi Nzimande (215081343)
Graduate School of Business & Leadership
Westville Campus

Dear Mr Nzimande,

Protocol reference number: HSS/1286/018M
Project title: The economic effect of changing from steel to aluminium beverage packaging metal cans within the packaging industry

Approval Notification – Expedited Application

In response to your application received on 27 August 2018, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

[redacted]

.....
Professor Shenuka Singh (Chair)

/ms

Cc Supervisor: Dr Emmanuel Mutambara
cc Academic Leader Research: Professor Muhammad Hoque
cc School Administrator: Ms Zarina Bullyraj