An analysis of the performance of a South African stainless steel manufacturer in localising the demand for corrosion resistant steels within the Eastern Cape catalytic converter industry

by

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This dissertation is submitted in partial fulfilment of the requirements for the degree of Masters in Business Administration, Port Elizabeth Technikon. This work has not been previously accepted in substance for any degree and is not being concurrently submitted in candidature for any other degree. The research contained in this document is a result of my own independent work and investigation, except where otherwise stated. All sources consulted are acknowledged and referenced.

Robert Soiné

20th January 2004
Abstract

Commercial decisions are been made with respect to the competitive advantage of manufacturing catalytic converters in South Africa. This thesis identifies those factors relating to the sourcing of stainless steel and the impact it has of securing future business in a competitive environment.

The catalytic converter industry requires the support of a stainless steel plant that provides high quality products at a competitive price, while keeping abreast with international developments.
Acknowledgements

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CHAPTER ONE

PROBLEM STATEMENT AND RESEARCH DEFINITION

1.1 INTRODUCTION

Until the early 1990’s, the only demand for exhaust systems came from the local Original Equipment Manufacturers (OEMs) in South Africa which supported the domestic market. The situation however dramatically changed with the introduction of the Motor Industry Development Programme (MIDP), which created sufficient incentives for the manufacture and export of automotive components from South Africa, including catalytic converters and silencers which become viable export products.

Although this developing market has not been created from the natural supply and demand forces, the catalytic converter industry continues to grow and many organisations are making huge investments in this sector. The MIDP programme has artificially stimulated the industry through the financial gains generated via rebate certificates. The performance of local steel producers, together with the extent to which the export rebates are scaled down over the next few years by local government, will be the major factor contributing to the future of the South African catalytic converter industry.
1.2 MAIN PROBLEM

The main problem to be researched in this project is as follows:

What is the effect of locally produced corrosion resistant stainless steel in supporting the long-term strategic competitiveness and survival of the South African catalytic converter industry?

Government has realised the benefits of engaging in international trade and being recognised as an international player. With the advent of the democratic government in South Africa, all forms of trade restrictions imposed on the country have been withdrawn and foreign trading partners are actively encouraged to support the new South African government’s endeavours to rebuild the economy.

Government has followed the new trade theory in promoting the export of locally manufactured goods. Certain regulations have also been put in place to restrict the importation of other products in order to protect local manufacturers to a certain extent.

Hill (1999: 146) argues that certain new trade theorists have promoted the idea of a strategic trade policy. The argument is that government, by the sophisticated and judicious use of subsidies, may be able to increase the chances of domestic firms in becoming first movers in newly emerging industries.
1.3 SUB-PROBLEMS

In an attempt to solve the main problem, the following sub-problems will be discussed:

- What are the competitive factors in the South African catalytic converter industry that may be leveraged through the use of locally sourced stainless steel?
- What supply chain management strategies can be leveraged in promoting the competitive advantage of manufacturing catalytic converters within South Africa?
- How does the structure of the South African stainless steel industry impact on the long-term survival of the local catalytic converter industry?
- How do South African customer organisations rate the supply performance of locally manufactured stainless steel?
- What factors do knowledgeable people from the catalytic converter industry believe can contribute to improving the performance of locally manufactured stainless steel?

1.4 DEFINITION OF KEY CONCEPTS

In order to gain clarity on certain terms, a discussion of each term is set out below.
1.4.1 THE SOUTH AFRICAN CATALYTIC CONVERTER INDUSTRY

All new vehicles in Europe, America and the East are compelled to have catalytic converters installed which control emission fumes. At present there is no legislation enforcing the installation of catalytic converters. Brians (2002) explains that most modern cars are equipped with three-way catalytic converters, which regulate emissions by reducing carbon monoxide, VOC’s and NOx molecules. The converter uses two different types of catalyst, namely, a reduction catalyst and an oxidation catalyst. Both types consist of a metallic or ceramic structure coated with a metal catalyst, usually platinum, rhodium and palladium. The intention is to create a structure that exposes the maximum surface area of catalyst to the exhaust stream while minimizing the amount of catalyst required.

The South African catalytic converter industry is becoming renowned for its ability to compete in the global market. Foreign trade in the lucrative catalytic converter industry has been one of the major successes of export initiatives. The Nelson Mandela Metropole (Port Elizabeth and Uitenhage), which is widely known as the Detroit of South Africa, is responsible for producing a large portion of South Africa’s automotive components for the local and export markets. South Africa is a major producer of the precious metals used for catalytic converter substrate coatings. Johnson Matthey, OMG, Asec and Engelhard have all established substrate coating facilities in South Africa to support the continued expansion of the catalytic converter industry.
The following extract from an article in Business Day (Fraser, 2003) illustrates this point:

The government-initiated Motor Industry Development Programme (MIDP) was aimed at promoting home-grown export-quality manufacturing and Eberspächer SA is one of its success stories.

According to Paul Erasmus (MD – Eberspächer SA, personal communication, 9 September 2003) the growth and international interest in South Africa has attracted a host of new entrants to the lucrative catalytic converter industry. South Africa currently supplies 10-14% of the world’s demand for catalytic converters and this percentage is expected to rise over the next three years, depending on government policy with regard to the development of the domestic motor industry. Eberspächer, Calsonic, Tenneco, Arvin, Zeuna Stärker, Faurecia, Magneti Marelli and Bosal have shown capital expansion over the past year.

According to the Nelson Mandela Bay Review 2003/2004 (2003: 41) the Eastern Cape’s catalytic converter industry has received major new investments. This is a massive boost for the region, positioning it as one of the biggest global players in this field and highlighting it as a centre with specialised expertise in the manufacture and export of catalytic converters. Exposure of this rising catalytic converter industry has created increasingly more attractive spin-off opportunities for companies manufacturing single components.
1.4.2 THE MOTOR INDUSTRY DEVELOPMENT PROGRAMME

Robertson (2001: 12) states that the MIDP was introduced in September 1995 in an effort to reshape the future direction of the industry regarding trade liberalisation, globalisation of markets, job creation, technological changes, rising customer expectations, export and foreign investment. This has resulted in the reduction of import duty on completely built-up units from 65% when the MIDP was introduced and is expected to reduce to 30% by 2007. The import duty on components fell from 49% in 1995 and is expected to reduce to 25% by 2007. Exporters of completely built-up vehicles and components are able to use a portion of the export value as a rebate on imports. This portion is also expected to reduce by 2007.

The intention of the MIDP programme is to rationalise the South African motor industry, reduce production costs by encouraging longer production runs of fewer models, stimulate new employment and create a positive balance of trade in motor vehicle and motor vehicle components (Rory Schimper – Commercial Manager Arvin, personal communication, 1 September 2003).

The South African Department of Trade and Industry (DTI) in Pretoria administers the MIDP with the help of customs officials. To participate in the scheme, the importer and exporter must be registered with the DTI, as must the exported product and the manufacturer. It is also clear that the overall future of the catalytic converter industry will depend on how the government reviews and implements the export incentive programme. Should they
discontinue the programme after 2007, there will be very little benefit in producing these products in South Africa if the local industry does not become globally competitive (Motor Industry Development Programme, 7 September 2001).

According to Paul Gerrard (Manager Export Operations – Delta SA, personal communication, 28 September 2003) with the proposed phasing out of the MIDP programme, it can be expected that some international companies will retract from the South African catalytic converter industry over the next five years. Only the most efficient and innovative South African catalytic converter companies will survive. What is therefore evident is that the catalytic converter industry in South Africa is an artificial industry, which is currently dependent on the government’s incentive export scheme.

1.4.3 ORIGINAL EQUIPMENT MANUFACTURER

The catalytic converter industry in South Africa is directly dependent on the local OEMs success, as they are the initiators in pressurising their parent companies to build catalytic converters in South Africa. This partnership allows them to obtain government rebates to finance importation of components for the assembly of motor vehicles (Van der Kooy, 2000: 419).

According to Robertson (2000: 12), vehicle manufactures have supported the development of the catalytic converter industry because it is a high-value, high-tech product from which they can earn the export credits they need to be able to import low-volume vehicles into South Africa.
The core of the MIDP programme has seen the steady reduction in duties on imported cars from well over 100% to 32.5%. Manufacturers earn export credits on locally manufactured components of exported vehicles, which they can use to reduce their total duty payable on imports of low-volume vehicles so as to concentrate on high-volume manufacture (Newman, Sunday Times, 2002: 18).

Lourens and Claasen (2002) state that South Africa’s entire automotive sector is holding its collective breath in anticipation of the outcome of the reviewed MIDP programme, which will be applied from 2007 to 2012. In line with the government’s move towards trade liberation and assistance to the sector through the MIDP programme, it is expected that this benefit will be scaled down. The industry faces demise if the government continues to discriminate against Precious Group Metals (PGMs) used by the industry. It was explained that 50% of the value of PGMs used in the manufacture of catalytic converters is regarded as “local content”, despite the fact that all PGMs used by the industry are sourced from domestic mining companies. The MIDP programme rewards local content in catalytic converters by awarding manufacturers export credits based on the quantity of local content. The credits are used to offset the price of duty paid on imports. This arrangement makes it lucrative to manufacture converters in South Africa. By not recognising the full PGM content as local content the government has made this sector appear less attractive to investors. The aim was not only to attract investments in the
catalytic converter sector but across a range of automotive operators (Lourens and Claasen, 2002).

The automotive manufacturing industry is a significant role player in the South African economy, contributing approximately 5.4% of gross domestic product (GDP). However, the automotive industry has been a protected market and South African production and sales of vehicles account for only approximately 0.6% of the world market. Due to globalisation, the industry is rapidly changing from a domestic market focused industry to that of a proliferation of models. Alignment of the local industry with global trends is crucial to the long-term sustainability and viability of the local industry, both in manufacturing and downstream industries (Fernandes and Steyn, 2001: 1).

Lower design and manufacturing costs for press and assembly tooling have made South African suppliers a major port of call for all vehicle manufacturers. With this area’s diverse range of automotive equipment, a basis for collaboration also exists with the converter industry cluster, with numerous converter manufacturers supplying products to the motor industry. Suppliers of components have exceptional growth prospects and there is huge potential when bearing in mind the type of capability that has been shown (Nelson Mandela Bay Review 2003/2004, 2003: 53).

1.4.4 REBATES AND THE CATALYTIC CONVERTER INDUSTRY

The ability to collect rebate certificates from export programmes makes the converter industry, driven predominantly by the OEMs, a lucrative business.
Representatives from companies within the catalytic converter industry have formed an association called the Catalytic Converter Interest Group (CCIG). Meetings are held on a monthly basis to discuss the importance of understanding the impact of the new MIDP programme principles to counter current negative perceptions. Political stability and positive micro-economic conditions are a prerequisite to South Africa's economic growth. The key challenge facing the catalytic converter industry is to ensure that the operation becomes even more internationally competitive through the continuous improvement of efficiency and the attainment of world-class manufacturing standards.

The design and materials specified by the designers play a vital role in calculating the value of the rebate certificate when manufactured locally and exporting the finished product abroad. At present, the market continues to expand with more and more organisations becoming involved within the MIDP programme structure associated with the catalytic converter industry. The OEMs ordering these components from South African manufacturers, benefit from the rebates generated (Van der Kooy, 2000: 27).

1.4.5 CORROSION RESISTANT STEEL

Stainless steel plays a major role in the hygienic preparation or storage of almost everything that we eat or drink. All modern vehicles boast stainless steel components in critical areas, for example exhausts, safety belt buckles, airbag gas cylinders and catalytic converters. Stainless steel is increasingly
finding new applications in decoration, signage, shop fittings, architecture, furniture, appliances and technology (Columbus Stainless Steel, 2002).

English metallurgist Harry Brearly accidentally discovered stain resistant steel by adding chromium to low carbon steel. The chromium in the steel combines with oxygen in the atmosphere to form a thin, invisible layer of chrome-containing oxide called the “passive film” (Helmenstine, 2003).

Stainless steel is generally seen as a family of chromium-containing alloys. All these alloys contain at least 11% chromium. The chrome oxide layer on the metal is what makes stainless steel corrosion resistant. This layer is only about one micron thick but is incredibly strong and, when it is damaged, it regenerates itself as long as oxygen is available. The stainless steel family tree comprises of martensitic, ferritic, austenitic and duplex type stainless steels. Columbus Stainless Steel makes the most commonly used types: ferritics and austenitics. Ferritic stainless steels are plain chromium-type steels containing 12%-18% chromium, the balance being mainly iron. Conventional austenitic stainless steels typically contain 18% chromium and 8% nickel, with the balance being mainly iron (Columbus Stainless Steel, 2002).

Austenitic steel has excellent corrosion resistance, good formability, weldability and good mechanical properties. Ferritic steel has magnetic properties, good ductility, especially resistant to elevated temperature stress
and corrosion cracking and is a cheaper stainless steel than austenitic steels (Columbus Stainless Steel, 2002).

1.4.6 COMPETITIVE STRATEGY AND ADVANTAGE

The infrastructure supporting the catalytic converter industry in South Africa has enabled the South African government to establish and regulate certain policies to promote national competitors within the global market of catalytic converter manufacturing.

South Africa has a relatively large and diverse economy which is the powerhouse of Africa. South Africa's trade and industry policy is in the process of fundamental change, moving away from a highly protected, inward-looking economy toward an internationally competitive economy capitalising on its competitive and comparative advantages (Columbus Stainless Steel, 2002).

Saunders (1997: 197) stresses that the planning and control of purchasing and supply activities needs to be linked to processes connected to the strategic management of the organisation as a whole. Ideas continue to evolve concerning strategic management at functional, business unit and corporate levels.

The globalisation of production refers to the tendency among firms to source goods and services from locations around the globe to take advantage of national differences in the cost and quality of factors of production.
Companies hope to lower their overall cost structure and/or improve the quality or functionality of their product offering, thereby allowing them to compete more effectively. By offering a standardised product worldwide, they are helping to create a global market (Hill, 1999: 7).

Goldman, Nagel and Preiss (1994: 75) note that becoming an agile competitor involves rethinking what products are, how they should be made and how much buyers should pay for them. The goal is thus to develop strategic relationships with customers. Similarly, Hellriegel, Jackson and Slocum (1999: 94) identify the effect of long-term profitability of organisations and state that alliances and strategic plans are required to ensure long-term viability.

Stevenson (1996: 50) states that it is necessary for marketing and operations to closely match the customer’s needs with the operation’s capabilities, while taking competitive competencies into account when viewing raw materials. The process of strategy formulation also includes environmental scanning where external factors (economic and political conditions, the legal environment, technology, competition and markets) and internal factors (human resources, facilities, financial resources, suppliers, customers and technology) are considered.

1.4.7 SUPPLY CHAIN MANAGEMENT

Pycraft, Singh, Phihlela, Slack, Chambers, Harland, Harrison and Johnsten (1997: 475) define the supply chain management as managing the entire
chain of raw material supply, manufacture, assembly and distribution to the end customer. Supply chain management strives at improving the way raw material is found, processed and delivered to the customer.

According to Saunders (1997: 150) it is possible to break out of the conventional differentiation between purchasing, supply and manufacturing and to consider a more integrated perspective, which links them together in a framework for supply chain strategy. This could include factors such as JIT (Just in Time) and JIS (Just in Sequence) deliveries.

According to Porter (1990: 105; 107) national success in an industry is particularly likely if the nation has competitive advantages in a number of related industries. Related industries are those in which firms can co-ordinate or share activities in the value chain when competing, or those that involve products that are complementary.

1.4.8 PERFORMANCE

Maximum performance can only be achieved if departments have specific performance measures that reflect the company’s key performance factors. Achieving maximum performance is a balancing act, not a single problem of optimising one variable (Kaydos, 1991: 62). The company needs to coordinate every link in the chain to maximise performance.

According to Saunders (1997: 312), the challenge for most firms is to maximise supplier performance contributions and capability improvements at
levels better than competitors. A firm, which can accomplish this is in a position to achieve competitive advantages through its purchasing and sourcing processes.

Hugo and Van Rooyen (1992: 287) argue that performance evaluation of materials supply activities is a control process consisting of a systematic investigation into and value assessment of the actual performance of the purchasing function and of materials management with the aid of measures and norms aimed at assessing and improving performance.

1.5 DELIMITATION OF RESEARCH

In order to ensure that the research project is of manageable focus, it is necessary to demarcate the area of research.

1.5.1 DEMARCATION OF THE ORGANISATIONS TO BE RESEARCHED

The scope of the research is limited to the major producer of flat stainless steel products in South Africa and the vendors it supplies in supporting the requirements of the Eastern Cape catalytic converter industry.

1.5.2 GEOGRAPHICAL DEMARCATION

The areas to be researched are the Eastern Cape where the catalytic converter industry is situated and Mpumalanga Province where the major source of stainless steel is situated.
1.6 SIGNIFICANCE OF RESEARCH

The procurement of raw materials at a competitive price and high levels of quality and timeliness of delivery are vital ingredients in satisfying customer needs. The presence of numerous catalytic converter companies within South Africa places enormous pressure on the relatively few ‘A’ grade suppliers of raw materials, components, press parts and sub-assemblies. The current situation does not allow for competition in the market place leading to higher prices.

The recent sale of Columbus Stainless Steel to a Spanish company (Acerinox) and the effects this has had on product ranges, flexibility, lead times and pricing structures will be highlighted.

This project will identify the performance of the major supplier of stainless steel in meeting the customer requirements in leveraging competitive advantage.

1.7 MOTIVATION FOR THE RESEARCH

To maintain a competitive edge in the global market, manufacturers need competitively priced raw materials. With a global shift towards environmentally friendly products and legislation being passed such as the American Emissions Bill, the global motor industry will continue to move towards the use of catalytic converters. In South Africa, a move towards more environmentally friendly motoring was made with the introduction of unleaded petrol.
It is the researcher’s opinion that the South African converter industry can remain competitive in the future, but the sourcing decision of stainless steel is questionable. With the continuous decline of rebate incentives, the local content requirement will not be of high importance and the decision to import stainless steel could become a reality. The South African government will be required to evaluate the current regulation on stainless steel and capitalise on the locally mined raw material used for PGM coatings (chrome, nickel, etc.).

1.8 RESEARCH DESIGN

In this section, the methodology to be followed in the research project is described.

1.8.1 RESEARCH METHODOLOGY

The following procedures will be adopted in conducting the research project in order to solve the main and sub-problems:

1.8.1.1 Literature study

A literature study will be conducted in order to identify the strategies for competitive advantage and the key performance factors of locally manufactured corrosion resistant stainless steel. Information will be gathered from libraries, the Internet, steel vendors, the catalytic converter industry and knowledgeable people within the industry.
1.8.1.2 Empirical study

The empirical study will consist of the following:

• a survey will be conducted to determine the performance of local stainless steel manufacturers and distributors;

• the measuring instruments to be used in the survey will be a questionnaire developed by the researcher based on information gained during the literature study; and

• the data retrieved from the survey will be interpreted and analysed using recognised statistical procedures.

1.8.2 THE DEVELOPMENT OF CONCLUSIONS

Information gathered in the literature survey, together with the results of the empirical study, will be analysed with regard to the performance of locally manufactured corrosion resistant stainless steel in supporting the catalytic converter industry in South Africa. The decision regarding the sourcing of stainless steel will be highlighted, together with the companies’ strategies to remain globally competitive.

1.9 PROPOSED PROGRAMME OF STUDY

The researcher has planned to include the following chapters:

Chapter 1  The problem statement and research definition.

Chapter 2  The theory of corporate strategy and competitive advantage in the catalytic converter industry.

Chapter 3  Supply chain management.

Chapter 4  The supply of stainless steel in supporting the Eastern Cape catalytic converter industry.
Chapter 5  Research methodology and design.
Chapter 6  Results and discussion of the empirical study.
Chapter 7  Conclusion and recommendations.

1.10 SUMMARY

In this chapter, the importance of this research was set out. In order to resolve the main problem, sub-problems were identified and key terms have been defined in order to give the reader an understanding of these terms in the context of the study.

In the following chapters, the researcher will attempt to investigate the current conditions under which stainless steel is sourced within the South African market and the demands placed thereon. The implication of maintaining a healthy supply chain for the benefit of all role-players will be discussed.

According to the Nelson Mandela Bay Review 2003/2004 (2003: 8), the goal of substantially increasing job opportunities hinges on the further development of the exceptional strengths of the motor industry sectors of this area. While the country’s leaders make their presence felt in overseas circles, the Eastern Cape aspires to play a far greater contributory role in improving economic growth in South Africa, with focused investment strategies opening up immense possibilities.

In Chapter Two, the theory of corporate strategy and competitive advantage will be discussed.
CHAPTER TWO

THE THEORY OF CORPORATE STRATEGY AND
COMPETITIVE ADVANTAGE IN THE CATALYTIC CONVERTER
INDUSTRY

2.1 INTRODUCTION

In the previous chapter, the main problem and sub-problems were identified
and a brief explanation was given of the key terms to be used. This chapter
aims to evaluate the contexts of corporate strategy and competitive
advantage regarding the catalytic converter industry in relation to these
concepts.

Hamel and Prahalad (1994: 125) view strategy as the stretch between the
companies existing resources and its ambitions. Strategy is thus seen as the
development of a view of the future and shaping the company and its
environment to that view. Gaining a strategic advantage over competitors is a
key part of survival and logistics are seen to play a role in helping to gain that
competitive advantage. Understanding how to gain competitive advantage
and how logistics can contribute to the success of the catalytic converter
industry will be discussed in this chapter.

South Africa is situated far from its’ export markets and is required to land the
product at the customers’ location and to include transport, insurance and
finance charges at a competitive rate. The challenge for the industry is to
become truly globally competitive while the MIDP programme protection is still
in place (Paul Gerrard - Manager Export Operation Delta, personal communication, 28 September 2003).

With the rapid increase in the export of South African manufactured vehicles, the automotive component industry is showing enormous growth. Vehicle manufacturers who do not have local infrastructure are forced to link with the local industry to acquire export credits in order to become competitive. This normally requires an investment in the component infrastructure. Once the MIDP programme is phased out, the industry will have to compete on its own ability, with only inbound logistics and possibly a minor import duty offering protection against imported competition. The need for corporate strategy in achieving competitive advantage within the catalytic converter industry is vital for future survival (Van Huyssteen, 2002: 18).

According to Johnson and Scholes (1999: 19), strategic analysis aims to identify the key factors, which influence the present and future wellbeing of an organisation. These influences include the geographical and economic environment, together with the strategic capability in terms of resources and competencies internal to the organisation.

Goldman et al (1994: 72) state that the competitive advantage of modern industry is not due to the exploitation of technology but the way in which people, organisations and technology are coordinated to form new business entities.
For the purpose of this study, the definition offered by Johnson and Scholes (1999: 10) serves as a reference:

Strategy is the direction and scope of the organisation over the long term which achieves advantage for the organisation through its configuration of resources within a changing environment, to meet the needs of markets and to fulfill stakeholder expectations.

This chapter will highlight factors such as MIDP, local content, globalisation, customs regulation and competitive strategies required to remain globally competitive. This will assist in answering the first sub-problem namely: What are the competitive factors in the South African catalytic converter industry that may be leveraged through the use of locally sourced stainless steel?

### 2.2 MOTOR INDUSTRY DEVELOPMENT PROGRAMME

Although export incentives available in terms of the MIDP programme do not provide a cash incentive to the exporters, they do provide a very attractive facility to foreign OEMs whereby they can competitively market their vehicles in South Africa if they engage in an exchange of trade with domestic component makers. In so doing, the domestic government seeks to expand and develop those sectors of the local motor vehicle manufacturing industry which are globally competitive and sustainable in the long term.

Plummer (2002) states that the reason for exponential growth of the MIDP programme is that every export generates an equal value of imports, either
via components or motor vehicles. Renault, Honda, MG, Rover, Peugeot and other motor vehicle manufactures have all publicly stated that without the export credits to offset import duty they would be unable to successfully export to South Africa. Passenger vehicle imports have grown rapidly and account for more than 30% of the domestic market sales. Export growth has therefore replaced growth in the domestic market rather than complementing it (Plummer, 2002).

The European Union remains the largest export destination for South African components and accounts for over 70%, by value, of the industry’s component exports. According to the National Association of Automobile Manufacturers of South Africa (NAAMSA), exports of built up vehicles are supplied to Europe, the United States, Japan, Australia and the Far East. A team made up of members of OEMs, the Department of Trade and Industry (DTI) and Trade Investment South Africa (TISA) have identified gaps in the international market. A new leadership team has been appointed and a focused investment plan, supported by the MIDP programme is being monitored (Bruce, 2003).

Lourens and Claasen (2002) also recognise the MIDP programme as a key factor in the establishment of the now thriving catalytic converter industry which was virtually non-existent seven years ago. Since then, mostly foreign investment to the value of R1.9bn has poured into South Africa to set up catalytic converter manufacturers and related plants. The sector now consists of about fifteen companies which employ more than 3500 people. The
companies are mostly affiliated to large multinationals such as Faurecia, Bosal, Tenneco, Magnet Marelli, Arvin, Eberspächer, Corning, Engelhard and others. These operations, most of which operate from Port Elizabeth in the Eastern Cape, now produce about 12% of the global demand for catalytic converters. They manufacture 6 million converters a year, of which about 97% are exported.

Statistics show phenomenal growth since 2000, reflecting the success of the MIDP programme. South Africa’s automotive sector has seen phenomenal growth in recent years, with the value of exports doubling from R20bn in 2000 to R40bn in 2003, according to new statistics published by the Automotive Industry Export Council. The statistics reflect the success of the export-promoting MIDP although the pace of export growth may decrease in the future because of the strong Rand and the depressed global economy (Fraser, 2003).

According to Ryan (2001: 15), after struggling with depressed local economic conditions for years, South Africa’s seven motor vehicle manufacturers have over the past decade focused on the niche export markets, integrating into the manufacturing and supply plans, multinational principles. Although exports have become a main focal point of the South African motor vehicle manufacturing industry, extending a lifeline to an industry whose existence is simply not warranted by domestic volumes alone, motor vehicle imports have grown equally dramatically. The core of the MIDP programme has seen the steady reduction in duties. Foreign manufacturers can achieve lower
manufacturing costs because they manufacture for the global market and therefore can achieve economies of scale. South African manufacturers who are just entering international markets as competitors are at a cost disadvantage due to protectionism during the eras of the economic isolation of the country. In addition, domestic labour costs are relatively high and productivity low, therefore some time will be needed for manufacturing to become competitive in terms of prices in international markets. Those purchasing on international markets therefore have a cost advantage over competitors who purchase exclusively on domestic market.

2.3 CORPORATE STRATEGY AND ADVANTAGE

The importance of strategically managing supplies is viewed from both the business and the corporate point of view and the ways that the management of supplies can impact on the performance of the organisation, as a whole, is vital (Saunders, 1997: viii). Criteria such as quality, delivery, cost and flexibility impact on the competitive capability of the firm to meet customer requirements and match, if not beat, their competitors.

Hugo, Van Rooyen and Badenhorst (1997: 8) hold a more financial view of corporate strategy in stating that the basic objective of the firm is to ensure the highest possible return on the capital invested by the firm by satisfying the needs of the consumers. This ultimately maximises the wealth of the firm’s owners and the community as a whole.
Kotler (1997: 53) declares that:

> Competitive advantage is a company’s ability to perform in one or more ways that competitors cannot or will not match. Companies strive to build sustainable competitive advantages. Those that succeed, deliver high customer value and satisfaction which leads to high repeat purchases and therefore high company profitability.

According to Stevenson (1996: 47), an organisation has overall strategies which relate to and influence the entire organisation. Functional strategies, such as operations strategies, should support organisational strategies just as the goals and mission of the organisation. Stevenson (1996: 52) goes on to say that traditional strategies emphasise cost reduction or product differentiation and argues for the adoption of newer strategies such as quality-based strategies, integrating quality into all phases of the organisation. Pycraft et al (1997: 774) add that operational strategies must provide for appropriate improvements, be comprehensive, coherent and consistent over time. It also needs credibility in that strategic change should be seen as feasible.

Coyle, Bardi and Langley (2003: 152) uses Porter’s dynamic diamond to explain his theories of what produces competitive advantage in a global business environment. Porter suggests a dynamic diamond containing four elements of competitive advantage that reinforce one another.
2.3.1 Factor conditions

Factor conditions refer to a nation’s ability to transform its basic factor conditions (e.g., resources, education, or infrastructure) into competitive advantage. The cost of labour, electricity and locally mined precious metals would be considered competitive factors in the catalytic converter industry.

2.3.2 Demand conditions

Demand conditions refer to market size, buyer sophistication and media exposure of available products. The need for the OEMs to offset the cost of importing components and fully built-up motor vehicles via the MIDP programme has stimulated the demand for manufacturing catalytic converters in South Africa.
2.3.3 Related and supporting industries

These industries may include partners in the supply chain, co-packers and/or co-manufacturers or marketing and distribution intermediaries. The increase in the related and supporting industry has grown substantially in the catalytic converter industry due to the success of the MIDP programme and OEM driven project.

2.3.4 Company strategy, structure and rivalry

Company strategy, structure and rivalry refer to market structures and the nature of domestic competition. According to Paul Erasmus (MD – Eberspächer SA, personal communication, 9 September 2003), even though there is competition in the local catalytic converter industry, each manufacturer has developed a niche market as in the case of Eberspächer South Africa together with Audi.

2.4 GLOBALISATION AND ECONOMIES OF SCALE

The concept of globalisation of business organisations is based on gaining a competitive edge by optimising the value added through sourcing internationally for the best product mix of inputs and on marketing products with word-best characteristics of quality, price and customer satisfaction (Hugo et al, 1997: 308).

Economies of scale in production means that production at a larger scale can be achieved at lower cost. Economies of scale are most likely to be found in
industries with large fixed costs in production. For example, fixed costs arise when large amounts of capital equipment must be put in place even if only one unit is to be produced and the cost of this equipment must still be paid even with zero output. The larger the output, the more the equipment costs can be amortised over the larger volume. Large fixed costs and hence economies of scale are prevalent in highly capital-intensive industries such as chemicals, petroleum, steel and automobiles to mention but a few (Suranovic, 2002).

According to Coyle et al (2003: 178), global business activity and global logistical activity is increasing. Businesses are relying on foreign countries to provide a source of raw materials and markets for finished goods. Logistics ties together these geographically distant sources and markets.

The world economy is moving away from national economies separated from each other by distance, time zones, language, culture and business systems. The merging of national economies into an interdependent global economic system has become known as globalisation and has been happening for many years (Hill, 2000: 4).

Companies are sourcing goods and services from locations around the world in an effort to take advantage of national differences in the cost and quality of production factors such as labour, energy, land and capital, thereby establishing a competitive advantage in the global marketplace (Hill, 2000: 7).
Bruce (2003: 75) states that there are numerous routes for companies and enterprises wanting to take the high road to the global motor vehicle manufacturing industry. These include mergers, acquisitions or joint ventures. The National Association of Automobile Component and Allied Manufacturers of South Africa (NAACAM) also promotes other types of industry co-operation such as technical collaboration in the design of products, systems or production methods/layouts, research and development, supplier/customer relations, joint production, technology transfer, licences and patents, marketing and co-operative promotion of projects and market sharing, commercial representation, franchising financing, strategic alliance and third country collaboration.

According to Coyle et al (2003: 395), supply chain management therefore usually has to be labelled “global supply chain management” in today’s environment. Globalisation presents some special challenges and issues for business organisations. The distance factor alone becomes significant with shipments moving thousands of miles from vendors and/or to customers. In an environment of reduced cycle times, expected higher levels or reliability and emphasis upon efficiency, the distance factor presents some special challenges to logistics and supply chain managers.

Hill (2000: 5) states that globalisation is a shift towards a more integrated and interdependent world economy that consists of the globalisation of markets and the globalisation of production which refers to the sourcing of goods and
services from various locations to take advantage of national differences in the cost and quality of production factors.

Global companies tend to be more successful at developing strategies that help them to achieve their business objectives simultaneously at locations throughout the world. These companies are likely to strategically source materials and components worldwide, select global locations for key supply depots and distribution centres, use existing logistics networks when sourcing and distributing new products and transfer existing logistics technologies to new markets (Coyle et al, 2003: 151).

Hill (2000: 7) also recognised globalisation of production which refers to a process of sourcing goods and services from locations around the globe to take advantage of national differences in the cost and quality of production factors such as labour, land, energy and capital. One of the most important trends in the global economy is the accelerated movement towards regional economic integration. The latter is attained through agreements between countries in a geographic region, which are aimed at reducing or removing tariff and other barriers to the free flow of goods and services.

In South Africa, political changes created the opportunity for the country to become part of the global market. International trade barriers were lowered to more acceptable standards by endorsing the Uruguay conference of the General Agreement on Tariffs and Trade (GATT) and the country thereby became part of the wider network of agreement established by the World
Trade Organisation Hugo et al (1997: 308). The international business environment itself was changed dramatically through a series of events which altered the global milieu.

Globalisation is a shift towards a more integrated and interdependent world economy that consists of two main components, namely:

- a globalisation of markets that refers to the merging of historically distinct and separate markets into one global marketplace (Hill, 2000: 5),
- a globalisation of product that refers to the sourcing of goods and services from various locations to take advantage of national differences in the cost and quality of production factors (Hill, 2000: 7).

Global corporations typically design their operating strategy objectives around four components namely; technology, marketing, manufacturing and logistics. While initiatives in all four areas should be synchronised, the logistics system serves as the global infrastructure upon which the other systems operate. Firms have recognised that the global logistics system itself may provide a source of competitive advantage.

2.5 CUSTOMS REGULATIONS

According to Coyle et al (2003: 176), national customs regulations have the greatest effect on the international movement of goods. Customs regulations fulfil two basic objectives, namely, to protect domestic industry and to provide
revenue. Customs regulations protect national industries through high import duties, quotas and restrictions on the items firms can import. If the companies involved research all of these factors before finalising the sales contract, the shipment will encounter few problems at the actual time of entry.

The success of regional integration should be measured in terms of the amount of trade it creates versus the amount it diverts. Trade creation refers to replacing high cost domestic producers with low cost producers within the free trade area and trade diversion refers to the replacement of lower cost external suppliers with higher cost suppliers within the free trade area (Hill, 2000: 237).

Cox (1997: 249) argues that countries use various policy instruments to interfere with the free-trade allocation of resources. A glance at any daily newspaper makes it clear that governments do not adhere to free trade despite the strong case for the efficiency and welfare gains from trade that has been developed. Policymakers have proven very resourceful in generating different devices for restricting the free flow of goods and services.

While many nations are nominally committed to free trade, in practice nations tend to intervene in international trade. The political and economic reasons for intervening are usually related to restricting imports and promoting exports. Normally their motives for intervention are to protect the domestic market producers and jobs from foreign competition, while increasing the foreign
market for domestic products. The main instruments of trade policy are tariffs, subsidies, import quotes, voluntary export restraints, local content requirements, anti-dumping policies and administrative policies (Hill, 1999: 152).

According to Bux Heather (Manager Quality – Eberspächer SA, personal communication, 4 November 2003) many developed nations demand that third world countries share their natural resources, often by means of exploitation in the name of fair trade. This is evident in both the precious metals and steel industry in South Africa.

2.6 TRANSPORTATION COSTS

A portion of the rebate value is used on many projects to offset the transportation costs incurred in delivering the catalytic converter to the international customer. Transport costs and sourcing decisions play a vital role in acquiring raw material and delivering the final product through the supply chain (Deon Horak - General Manager Logistics Eberspächer SA, personal communication, 15 September 2003).

The cost of shipping a product from one point to another is determined by a number of factors, including distance, size, weight, value and the overall volume of trade between the two points in question. Even though goods are produced in a country, they might not be traded on the international market because the comparative advantage is overcome by the cost of transport.
Consideration of transportation costs also illustrates that products subject to high transportation costs must have a relatively large production cost advantage if a country is to sell them to another country. It is not surprising that many bulk, heavy products are not traded (Appleyard and Field, 1997: 53).

2.7 PRODUCT PORTFOLIO ANALYSIS

It is Kotler’s (1997: 52) view that every company loses money on some of its customers. The well known 80/20 rules says that the top 20% of the customers may generate as much as 80% of the company’s profits. Furthermore, it isn’t necessarily the company’s largest customers yield the most profit. The largest customers demand considerable service and receive the largest discounts, thus reducing the company’s profit level. The smallest customers pay full price and receive minimal service but the costs of transacting with small customers reduce their profitability. The mid-size customers who receive good service and pay nearly full price are often the most profitable. This fact helps explain why many large firms that formally targeted only large customers are now invading the middle market. A company should not pursue and satisfy all customers.

According to Kotler (1997: 53), most companies fail to measure individual customer profitability. Ultimately, the company’s profitability depends on three elements as displayed in Figure 2.2.
Profits will be higher the higher the company’s value creation ability, the more efficient its internal operations and the greater its competitive advantage. Companies must not only create high absolute value but also high value relative to competitors at a sufficiently low cost (Kotler, 1997: 53).

2.8 RELATED AND SUPPORTING INDUSTRIES

Johnson and Scholes (1999: 110) state that one successful industry may lead to advantages in related and supporting industries. The reason for this is that the supplier industries produce inputs that are widely used and are important to innovation or internationalisation. The presence of related competitive industries in a nation is no less significant than unrelated industries.

Hill (2000: 141) states that the benefits of advanced factors of production by related and supporting industries should be transferred, thereby helping them achieve a strong competitive position internationally. One of the
consequences of this is that successful industries within a country tend to be grouped into a cluster of related industries.

Porter (1990: 106) goes on to say that the presence of an internationally successful related industry in a country provides opportunities for information flow and technical interchange. The presence of a related industry also raises the likelihood that new opportunities in the industry will be perceived. This also provides a source of new entrants which bring a new approach to competition. The presence of successfully related industries in a country may also hasten the development of supplier industries that serve both.

2.9 COMPETITIVE RIVALRY

Domestic rivalry and the search for competitive advantage within a nation can provide organisations with a basis for achieving such advantage on a more global scale (Johnson and Scholes, 1999: 110). Domestic rivalry becomes superior to rivalry with foreign competitors when improvement and innovation are recognised as the essential ingredients for competitive advantage in an industry (Porter, 1990: 117).

Coyle et al (2003: 63) argue that competition is frequently narrowly interpreted only in terms of price competition. While the price issue is certainly important in many markets, customer service can be a very important form of competition. For example, if a company can reliably provide customers with its products in a relatively short time period, then its customers can often
minimise inventory cost. A company should consider minimising buyer inventory costs to be just as important as keeping product prices low, since minimising such costs will contribute to more profit or in turn enable the seller to be more competitive. Customer service is therefore of great importance to the logistics area.

The supplier’s role in price determination has been mentioned. It has also been noted that purchasing policy and strategy have to react and adapt to the marketing policy and strategy of individual suppliers. The purchaser’s price determination will therefore be done while considering the strategic manoeuvres of the supplier’s pricing policy and strategy. It is therefore essential that the purchaser should be aware of the basic approach to price determination followed by suppliers (Hugo and Van Rooyen 1992: 126).

According to Porter (1990: 120), the geographical concentration of rivalry in a single city or region within a country magnifies the benefits of domestic rivalry. A firm must move fast to sustain its advantage, as the whole national industry is dynamic and to sustain, or even widen its advantage over foreign rivals which lack the same structure. Porter (1990: 122) states that the advantage of domestic rivalry is cancelled if there is no effective rivalry among the competitors.
2.10 THREAT OF NEW ENTRANTS

The threat of new competitors is dependent on the extent to which there are entry barriers such as economies of scale and high capital investment. The threat of substitutes limits the potential returns by placing a ceiling on prices that may be profitably charged for goods and services. The bargaining power of buyers and suppliers is related to their strength in negotiations as well as the impact of switching costs and price sensitivity. Rivalry amongst existing firms in an industry is related to tactics such as price competition, new product innovations and customer service (Porter, 1990: 23).

Each business operates in a general environment where external changes continually lead to a generation of new products, new organisations and new customers. This general business environment includes the political systems, economic systems, ecological systems and demographic influences all influencing the competitive environment (Hellriegel, 1998: 18). The general environment indirectly influences all organisations in an economic system as opposed to the task environment that includes only those factors in the general environment that directly influences an organisation’s success.

According to Baye (2000: 248) in some industries it is relatively easy for new firms to enter the market, whilst in others, it is more difficult. The optimal decisions by firms in an industry will depend on the ease with which new firms can enter the market. Numerous factors such as capital requirements can create a barrier to entry, making it difficult for other firms to enter an industry. Another is a patent, which give owners of patents the exclusive right to sell
their products for a specified period of time. In this instance, the patent serves as a barrier to entry, precluding other firms from producing the product produced by the patent holder.

According to Bux Heather (Manager Quality – Eberspächer SA, personal communication, 4 November 2003) the requirements and standard to enter the supply programme related to the motor industry is becoming more difficult. Accreditations such as TS, ISO and VDA are becoming the norm if a company wishes to supply the motor industry.

2.11 FOREIGN DIRECT INVESTMENT

Porter (1990: 113) states that creating and sustaining competitive advantage in many industries requires ongoing investment to upgrade skills, better understanding of the industry and exchange ideas across functions. The attitude of risk taking is an important aspect of personnel goals which influences the ability to achieve success in particular industries.

Efforts to liberalise trade and industrial development have seen South Africa established as a dynamic and internationally competitive investment location. The DTI supplies details on several major programmes that support business development and recognises the strategic role played by the small business sector (Nelson Mandela Bay Review 2003/2004, 2003: 14):

- Small Medium Enterprise Development Programme (SMEDP) – available to new and expanding concerns involved in manufacturing, agriculture, aquaculture, biotechnology, information technology,
tourism, the culture industry and business services. Investment in land, buildings, plant and machinery, commercial vehicles, research and development.

- **Foreign Investment Grant** – available to entities qualifying for the SMEDP incentives for new projects. Compensation of qualifying costs to transport new machinery and equipment from abroad.
- **Skills Support Programme** – offers a three-year cash grant to enable new investors and large expansions to prepare their workforce.
- **Critical Infrastructure Facility** – supports provision of economic infrastructure directly linked to private sector investment that has strategic value where immediate requirements are not in place to expedite the investment process.
- **Industrial Development Zone Programme** – offers duty free operating environments suited to export-orientated production, in purpose-built industrial estates linked to an international port or airport with quality infrastructure and expedited customs procedures.
- **Strategic Investment Programme** – offers an additional industrial investment allowance available to projects in the manufacturing, computer and research and development (R&D) fields.

Lourens (2002) confirms that foreign companies are looking at setting up plants in Port Elizabeth by 2003. One important concern for the industry about the forthcoming review is the percentage of government incentives regarding local content. Government is however reducing this percentage to stem growth in the catalytic converter sector in an effort to attract investment over a
range of components. Its aim is to build large automotive component sectors, as opposed to a large catalytic converter sector. The sector already accounts for just under half of all automotive components exported from South Africa.

According to Hood and Peters (2000: 72), Porter does not allow for the factors of foreign direct investment as he regards the domination of an industry by manufacturing activities of foreign-owned firms as a measure of competitive weakness. On the contrary, Hood and Peters (2000: 72) say the foreign manufacturing subsidiaries may over time, be able to contribute higher value to products and process innovations. This would benefit the industry by greater exposure to globalisation and often play an important role in sustaining local growth and development by riding continuous improvements in the local system of flexible production. Such foreign-owned firms will have an effect on the industry cluster to which they belong.

Bruce (2003: 75) states that, according to the DTI, South Africa has much to offer foreign companies. Government support for the automotive industry, based on a recent study by Deloitte and Touché (Bruce, 2003: 75), is in line with most developed nations. Government offers a range of supply-side measures to encourage investment, development and growth. Bruce (2003: 76) goes on to say that all seven South African-based assemblers are encouraging local investment by the components industry. Bruce (2003: 76) says, “I can promise you that the OEMs have a fundamental interest in maximising local content.”
According to the Nelson Mandela Bay Review 2003/2004 (2003: 53), stainless steel components have proved to be one of the more competitive and successful automotive exports. Factors that keep South Africa ahead include its production of more than 50% of the world’s chromium – a catalyst in the manufacture of stainless steel – as well as low electricity, labour and structural costs. The raw material supply is guaranteed for the foreseeable future and a consortium from Europe plans to commission a new stainless steel plant that will contribute about 5% of the world’s stainless steel production.

Tariff barriers have already been reduced, exchange controls relaxed and greater labour market flexibility has been introduced. The government welcomes foreign investors. Against the background of a rapidly transforming national economy, striving to expand and increase its competitive edge in world markets, the South African government has implemented many incentive programmes. These are aimed at accelerating and facilitating the transition to a competitive and sustainable manufacturing industry. In short, South Africa is ready and able to supply into the world markets. International investors now need to be made aware of the abundance of opportunities in order to develop confidence in the South African economy (Columbus Stainless Steel, 2002).
2.12 SUMMARY

The first sub-problems have been addressed in this chapter by examining the factors that can be leveraged in gaining competitive advantage in producing catalytic converters in South Africa. The chapter also explained the aspects that effect corporate strategy and globalisation in an enterprise. The theory analysed confirms that there is competitive advantage to be derived if competitive raw material is sourced. Companies striving to build sustainable competitive advantage need to deliver higher customer value and satisfaction, which leads to high repeat purchases and therefore high company profitability for these organisations.

Spekman (2002: 47) concludes that both customer focus and customer satisfaction indicate the importance of looking to the end-user as the final arbiter of competitive advantage.

Chapter Three looks at the supply chain and those factors that contribute to its success.
CHAPTER THREE
SUPPLY CHAIN MANAGEMENT

3.1 INTRODUCTION

The supply chain is a complex and interconnected network of relationships, which exists between individuals and companies, in order to transmit physical products and services in exchange for value. These networks of relationships, based on the transmission of physical products or services to the ultimate consumer, exist only because of this exchange of value (Cox, 1997: 208).

According to Halley (2002: 40), the supply chain is defined as a network of integrating organisations whose objective is to deliver a product or service to an end user, by integrating and coordinating the activities associated with the flow from raw material to the delivery of the finished product, through effective combinations of resources and skills contributing to the creating and delivery of value.

Basnet (2003: 57) concludes that supply chain management is a relatively new concept involving the integration of all the value-creating elements in the supply, manufacture and distribution process, from raw material extraction, through the transformation process, to the end-user consumption. The activities are motivated by the ideals of customer service, compression of lead-time and inventory reduction. The aim of the supply chain is more to
improve the quality and cost of the purchased product than to improve the capability of the supplier.

Perhaps the most interesting and challenging aspect of supply management is the development and management of the organisation’s supply chain. This chain is the upstream portion of the organisation’s value chain and is responsible for ensuring that the right materials, services and technology are purchased from the right source, at the right time, in the right quality. The value chain is a series of organisations extending all the way back to firms which extract materials from mother earth, perform a series of value-adding activities and fabricate the finished good or service purchased by the ultimate customer (Burt and Dobler, 1996: 13).

The focus of this chapter will be to identify what supply chain management strategies can be leveraged in promoting competitive advantages of manufacturing catalytic converters within South Africa. The competencies a company needs to achieve and maintain their logistical and supply chain excellence in solving the second sub-problem will be highlighted and discussed.

### 3.2 PERFORMANCE OBJECTIVES

According to Coyle et al (2003: 482), most organisations want to achieve efficiency in operations and effectiveness in dealing with their customers. Simply stating those two objectives is not adequate unless they have specific
performance metrics that enable them to gauge their success in achieving these objectives.

The performance objectives have both internal and external effects (Pycraft et al, 1997: 48):

- **Quality** – to satisfy your customers by providing error-free goods which are fit for their purpose.
- **Speed** – to minimise the time between the customer asking for the goods and the customer receiving the goods in full.
- **Dependability** – to keep the delivery promise you have given the customer, thus enabling an accurate estimate of delivery date. Communicate this date to the customer and then deliver exactly on time.
- **Flexibility** – to be able to vary or adapt the operational activities to cope with unexpected circumstances. Either way, being able to change far enough and fast enough to meet customer requirements.
- **Cost** – to produce goods appropriately priced for the market while allowing for a return to the organisation.
Figure 3.1: An operation contribution to business strategy by achieving five performance objectives

<table>
<thead>
<tr>
<th>Doing things right</th>
<th>gives</th>
<th>a quality advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doing things fast</td>
<td>gives</td>
<td>a speed advantage</td>
</tr>
<tr>
<td>Doing things on time</td>
<td>gives</td>
<td>a dependability advantage</td>
</tr>
<tr>
<td>Changing what you do</td>
<td>gives</td>
<td>a flexibility advantage</td>
</tr>
<tr>
<td>Doing things cheaply</td>
<td>gives</td>
<td>a cost advantage</td>
</tr>
</tbody>
</table>

Source: Adapted from Pycraft et al (1997: 49)

According to Coyle et al (2003: 101), the four traditional dimensions of customer service from a logistics perspective are time, dependability, convenience and communication, which are essential considerations in developing a sound and effective customer service programme. These dimensions of customer service also provide the underlying basis for establishing standards of performance for customer services in the logistics arena.

There are a number of approaches one could use to classify performance matrix, namely; time, quality, cost and supportive measures while measuring logistics and supply chain performance. Increased competition (as a result of globalisation) has also lead to more emphasis being placed on the need for operations being improved. The direction and priorities of improvement will be partly determined by the measure in which the operation fulfils the five
performance objectives of speed, cost, quality, dependability and flexibility (Pycraft et al, 1997: 652). It would thus be necessary to measure the components of each objective and then compare this current level of performance with historical targets, absolute and/or competitor performance standards. Pycraft et al (1997: 655) contend that competitor-based performance standards are more useful in terms of strategic performance improvement because it relates an operation’s performance directly to its competitive ability in the market place.

Table 3.1: Overview of strategic planning for logistics and supply chain management

<table>
<thead>
<tr>
<th>Time</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>- On-time delivery/receipt</td>
<td>- Finished goods inventory turns</td>
</tr>
<tr>
<td>- Order cycle time</td>
<td>- Days sales outstanding</td>
</tr>
<tr>
<td>- Order cycle time variability</td>
<td>- Cost to serve</td>
</tr>
<tr>
<td>- Response time</td>
<td>- Cash-to-cash cycle time</td>
</tr>
<tr>
<td>- Forecasting/Planning cycle time</td>
<td>- Total Delivered cost</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Overall customer satisfaction</td>
<td>- Cost of goods</td>
</tr>
<tr>
<td>- Processing accuracy</td>
<td>- Transportation costs</td>
</tr>
<tr>
<td>- Perfect order fulfilment</td>
<td>- Material handling costs</td>
</tr>
<tr>
<td>- On-time delivery</td>
<td>- All other costs</td>
</tr>
<tr>
<td>- Complete order</td>
<td>- Information systems</td>
</tr>
<tr>
<td>- Accurate product selection</td>
<td>- Administrative</td>
</tr>
<tr>
<td>- Damage-free</td>
<td>- Cost of excess capacity</td>
</tr>
<tr>
<td>- Accurate invoice</td>
<td>- Cost of capacity shortfall</td>
</tr>
<tr>
<td>- Forecast accuracy</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other/Supporting</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Approval exceptions to standard</td>
<td></td>
</tr>
<tr>
<td>- Minimum order quantity</td>
<td></td>
</tr>
<tr>
<td>- Change order timing</td>
<td></td>
</tr>
<tr>
<td>- Availability of information</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Coyle et al (2003: 490)
3.2.1 KEY PERFORMANCE INDICATORS

Key Performance Indicators can help organisations make the most measurement by focusing everyone’s attention on what matters most to the customer (Carman and Conrad, 2000: 90). These measurements provide organisations with the yardstick that indicate whether it is meeting the expectations of customers. They often provide early warnings long before the profit impact of not meeting customer requirements affects the financial statement.

In the context of plant and equipment, performance also entails aspects with regard to continuing use and the life of the product. Included in such considerations are reliability, durability, maintainability and length of life-continuing fitness for use. The problem with the definition of “fitness for purpose” or “fitness for use” is that it does not clearly address the problem of determining the characteristics of purpose or use. It is possible for designers to develop products that they believe have useful and desirable functional properties but, unless they have a clear understanding of what customers want, these properties might not be completely suitable for the uses the customers have in mind. Such a product would therefore not match customer requirements. Skilful market research can prevent such a mismatch from happening (Saunders, 1997: 237).

The strategic decisions made in different areas will exert influences on the various performance objectives of the operation even though the impact will differ. The company can however achieve an operations-based advantage
over its competitors depending on how well the operations functions perform in each of the five performance areas. These areas are quality, speed, dependability, flexibility and cost (Pycraft et al, 1997: 49).

The consideration of customer needs also has particular significance in the objectives of all operations because the fundamental purpose of operations is to create goods and services in such a way as to meet the needs of their customers. Customer needs provide insight into the importance of particular objectives, while the performance and activities of competitors assist in determining achieved performance.

3.2.2 MEASURING PERFORMANCE

The use of supplier performance evaluation systems is on the increase. Many progressive buying organisations monitor their major suppliers’ performance by observing their contract performance and source selection for follow-on procurements to ensure that only satisfactory performers are considered.

Formalised supplier evaluation programs have never had better odds for success than today. Total quality management (TQM) programmes are giving rise to the major organisational changes that will enable purchasing professionals to step into the corporate limelight and orchestrate the development of the supply base (Burt and Dobler, 1996: 431).

The performance of activities in the supply chain can have a major impact on the total performance of the organisation as a whole. Quality, delivery and
cost aspects of supply performance affect the ability of organisations to meet the demands of their environments. In particular, the ability to meet customer and financial goals can be significantly influenced by the degree of effectiveness and efficiency achieved in managing operations in the supply chain. Although there are variations in the level of impact, depending on the nature and operating circumstances of particular organisations, all effects will be significant. Purchasing and supply chain management strategies form an integral part of business and corporate strategies and they need to complement and be in harmony with the other functional strategies of the organisation. Rather than just playing a supportive role, purchasing and supply chain management strategies can produce capabilities that open up new opportunities for strategy formation at business and corporate levels. These strategies can provide added value as well as cost reductions. A firm’s competitiveness can be enhanced through quality improvements, logistics efficiencies and the compression of lead times (Saunders, 1997: 307).

Documents used by Eberspächer SA have been attached as Annexure 3.1, 3.2 and 3.3, which illustrate the summary of a good supplier (3M), a poor supplier (Autopipe) and a yearly rating system.

According to Hugo and Van Rooyen (1992: 297), material flow gives an indication of the degree of proficiency of the purchasing function allowing a continuous and prompt flow of materials between the supplier and the firm. It is obvious that, to some extent, this performance measure will overlap the preceding measure. As a basis for the evaluation of performance in
accordance with this measure, four points of departure can be used namely, the number of undelivered orders at a specific juncture, the number of outstanding orders, the number of urgent orders at a specific juncture, the number of urgent orders and the extent to which suppliers honour their promises to make deliveries.

3.3 CUSTOMER SERVICE

Coyle et al (2003: 104) state that the following customer service issues are important:

- What do our customers feel about present levels of service?
- Do their perceptions match up with ours?
- How do our services compare to those of our competitors?
- Are we using appropriate standards and measurements to monitor our service performance?
- Is it possible to segment our customers according to the varying degrees of service they require?
- Can we produce the same levels of service we are presently providing in a more cost effective manner?
- Can improved customer service be used as a strategic weapon to provide an important competitive advantage?
- In the minds of our customers, how important is service compared to other elements of the marketing mix, such as price, promotion and products?
Customer service has three recognised levels from a supply chain and logistics perspective. The minimum level is reliable, on-time delivery and accurately filled orders. In today's environment, this basic level of service is necessary to retain customers. To increase customer sales (especially large customers), it is necessary to be responsive to their special needs and requests. This second level may entail, for example, scheduled deliveries, advanced shipment notices, tailored pallet packs and so on (Coyle et al, 2003: 24).

3.4 POLICY GUIDELINES FOR SELECTING SUPPLIERS

The global business environment has generally seen many trade barriers fall over the past decade. Whether the cost involves trade between South Africa and other countries or between two or more foreign countries, the trend toward facilitating rather than constraining global business activity is definitely accelerating. Owing greatly to the growth and maturity of the ocean and air container shipping industries, national and specific country-to-country, international markets have been transformed into truly global businesses (Coyle et al, 2003: 150).

Suppliers should be selected within certain broad policy guidelines. These policy guidelines enable the purchasing division to make decisions more easily and give greater direction to their actions. Top management should approve policy guidelines because they should support the policy of the enterprise (Hugo et al, 1997: 151).
According to Hugo and Van Rooyen (1992: 45), material management is a confederacy of traditional material activities bound by a common idea – the idea of an integrated management approach to the planning, acquisition, conversion, flow and distribution of production materials from the raw-material stage to the finished-product state. Material management is the planning, directing, control and co-ordination of those activities concerning materials and inventory requirements, from the point of their inception to their introduction into the manufacturing process.

Logistics management comprises the movement of goods from supply to end user and the accompanying transfer and storage of the goods in the intermediary stages in a way that contributes to the achievement of the enterprise’s objectives. The essence of logistics management lies in three important concepts explained by these two definitions: the movement of goods, satisfactory customer service and reasonable costs. The existence of logistics management depends on these concepts. Logistics management creates form utility, place utility, time utility and possession utility for the consumer. From the enterprise’s point of view, the costs involved should place the firm at a competitive advantage (the price should be competitive) and ensure its profitability (Hugo and Van Rooyen, 1992: 52).

When an enterprise needs goods or services, the first step is to determine what is required in terms of its intended purpose (Hugo et al, 1997: 102). This means considering and deciding on the most economic inherent characteristics of requirements and also determining the right quality of goods
to be purchased and from which supplier. Companies are increasingly viewing global sourcing strategies as a means of reducing costs, increasing quality and enhancing a firm's overall competitive position (Petersen, 2000: 29).

3.4.1 INTERNATIONAL SUPPLIERS

The country gains by expanding production of and exporting the commodity that is relatively more valuable in the foreign market and reducing production of and importing the good that is relatively less expensive in the foreign market (Cox, 1997: 127).

International purchasing is only one of the activities of the purchasing function of the enterprise and therefore requires, to a large degree, the same expertise and skill, making use of the existing purchasing techniques and basic purchasing procedures required for purchasing on the domestic market. The sphere in which international purchasing is done is far more complex and therefore also demands special knowledge and skills on the part of the purchaser. The most important differences between international purchasing and purchasing on the domestic market relate to aspects such as monetary systems, interest rates, inflation, tax systems, exchange rates, language and cultural differences and the restriction placed on the international flow of goods and services by a country's authorities (Hugo et al, 1997: 309).
Table 3.2: Benefits, requirements and challenges of international sourcing

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Requirements</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to lower price goods</td>
<td>Top-management support</td>
<td>Diverse business practices</td>
</tr>
<tr>
<td>Access to higher quality goods</td>
<td>Developing communication skills</td>
<td>Nationalistic attitude</td>
</tr>
<tr>
<td>Better delivery performance</td>
<td>Establishing long-term relationships</td>
<td>Culture/language differences</td>
</tr>
<tr>
<td>Better customer performance</td>
<td>Knowledge of foreign business</td>
<td>Volatile exchange rates</td>
</tr>
<tr>
<td>Help meet counter trade obligations</td>
<td>Foreign supplier certification</td>
<td>Logistics support</td>
</tr>
<tr>
<td>Help develop a foreign presence</td>
<td>Obtaining expert assistance</td>
<td>JIT-sourcing requirements</td>
</tr>
<tr>
<td>Improved competitive position</td>
<td>Planning for global sourcing</td>
<td>Finding the qualified source</td>
</tr>
<tr>
<td>Increased number of suppliers</td>
<td>Diverse political environment</td>
<td>Duty/customs regulations</td>
</tr>
</tbody>
</table>

Source: Adapted from Hugo et al (1997: 309)

According to Coyle et al (2003: 9), the liberalisation of international trade has been aggressively pursued by a number of countries, which has opened up new markets and sources of suppliers for most companies. Due to opportunities enhanced by the technological revolution small, medium and large sized enterprises have been able to participate in globalisation. The consumer has ultimately benefited from the many alternative sources of supply for wholesalers and retailers which have lowered prices, raised product quality and dramatically increased choice alternatives for the consumer.

There are however, disadvantages in using international suppliers, including higher transport costs, longer lead times, more administration and exchange rate risks.
3.4.2 LOCAL SUPPLIERS

The geographical location of the suppliers is a policy aspect that requires attention. Local or nearby sources of supply have advantages such as:

- Low transport costs;
- Limited influence from exchange rate fluctuations;
- Shorter lead times and consequently smaller stocks;
- Shorter response times;
- Improved communication;
- Express orders easier expected;
- More reliable service;
- Better personnel relationship with supplier; and
- The possibility of implementing JIT system.

Apart from these advantages, it is good business practice to support local and regional business, thus contributing to the well-being and development of the area.

With its international connections, global customer base and state-of-the-art technology, the Eberspächer Group is well positioned to take advantage of the opportunities to expand its business in South Africa by using local suppliers. The selection of Port Elizabeth as its new home base has proved to be the correct choice. As the hub of manufacture of catalytic converters for the international market, the city offers a pleasant lifestyle for employees and an attractive location. Products leaving Eberspächer in Port Elizabeth are shipped to a variety of destinations such as the United States of America,
Japan, China, the United Kingdom and several countries within the EU (Nelson Mandela Bay Review 2003/2004, 2003: 41).

It is, however, important to remember that no universal guidelines can be suggested in respect of these policy aspects since the circumstances of each enterprise are unique.

3.5 ONE SUPPLIER OR MORE

Hugo is of the opinion that top management should formulate a policy to provide guidelines for purchasing a product from one or more suppliers (Hugo et al, 1997: 153). The concentrations of purchases from one supplier may be beneficial to the enterprise under certain circumstances:

- Where a successful relationship has been built up over the long term or where there is a long-term contract;
- When the supplier has patent rights or unique processes;
- When the supplier offers outstanding quality;
- When orders are too small to justify more than one supplier;
- When bigger discounts or lower transport costs make it worthwhile;
- When the enterprise has a stockless or JIT system or prefers systems contracts;
- When EDI (electronic data interchange) is used; and
- When partnerships with suppliers are preferred.

A disadvantage of a single source is that the supplier may become too complacent and unmotivated and no longer offer the service that they would if
there was competition. A further disadvantage is that monopolies may arise. Having more than one source of supply may also be to the enterprise’s advantage under certain circumstances:

- If the enterprise is buying strategic or important products it may be beneficial to have more than one supplier, since this reduces the risk of interruptions in the supply; and
- Long-term relationships may also be established with more than one supplier if, for instance, one supplier specialises in one product and the other supplier specialises in another product.

If one supplier does not have sufficient capacity to supply the enterprise’s current or future needs, it is desirable to have more than one supplier (Pycraft et al, 1997: 466)

Table 3.3: Advantages and disadvantages of single and multi-sourcing

<table>
<thead>
<tr>
<th></th>
<th>Single Sourcing</th>
<th>Multi-sourcing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages</td>
<td>• Potentially better quality because more SQA possibilities.</td>
<td>• Purchaser can drive price down by competitive tendering.</td>
</tr>
<tr>
<td></td>
<td>• Strong relationships.</td>
<td>• Can switch source in case of supply failure.</td>
</tr>
<tr>
<td></td>
<td>• Greater dependency encourages more commitment and effort.</td>
<td>• Wide sources of knowledge and expertise to tap.</td>
</tr>
<tr>
<td></td>
<td>• Better communication.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Easier to co-operate on new product development.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Higher confidentiality.</td>
<td></td>
</tr>
<tr>
<td>Disadvantages</td>
<td>• More vulnerability to disruptions if a failure to supply occurs.</td>
<td>• Difficult to encourage commitment by supply.</td>
</tr>
<tr>
<td></td>
<td>• Individual supplier more affected by volume fluctuations.</td>
<td>• Less easy to develop effective SQA.</td>
</tr>
<tr>
<td></td>
<td>• Suppliers might exert upward pressure on prices if no alternative supplier is available.</td>
<td>• More effort needed to communicate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Suppliers less likely to invest in new processes.</td>
</tr>
</tbody>
</table>
3.6 CHARACTERISTICS OF A GOOD SUPPLIER

Hugo et al (1997: 150) state that theoretically one should be able to define the "ideal" supplier, but it is doubtful whether such a supplier would always be readily available. It is nevertheless necessary that some idea be given of what constitutes a good supplier.

A good supplier:

- honours promises;
- has a stable background;
- always supplies the quality as specified at a fair and competitive price and delivers the goods at the agreed time;
- reacts quickly to varying unforeseen needs of the purchaser resulting from changing business circumstances and/or specification changes and/or maintenance problems and/or other requests;
- takes the initiative in suggesting better methods of service to help buyers make purchases more economically;
- warns the buyer in good time if, for whatever reason, that normal delivery cannot be made and even makes alternative arrangements so that the purchasing enterprise’s operations are not delayed; and
- takes the initiative when it comes to technological renewal and will offer the purchasing enterprise the necessary technical support and other expertise, if required (Hugo et al, 1997: 150).
In practice, the ideal supplier is hard to find but buyers should make every effort to trace the “best” possible supplier. A long-term relationship with the “best” supplier may be a great advantage to both the purchasing enterprise and the supplier. A long-term relationship does not imply that the given supplier should be periodically tested against the market to determine whether they are still the “best” supplier. In addition, in a long-term relationship, it is not only the purchaser who has to remain satisfied with the supplier; the supplier should also be satisfied with the purchasing enterprise. The enterprise should therefore keep to the agreement and meet the supplier’s expectations.

According to Hugo et al (1997: 5), the purchasing function deals broadly with those activities that have to be performed to ensure that good suppliers provide a firm with the right requirements, in the right quantities, at the right time and place and at the best possible price. The tools used to ensure that these activities work effectively are called purchasing paradigms.

### 3.7 SELECTING THE RIGHT SUPPLIER

According to Hugo et al (1997: 150), selecting the right supplier is considered to be one of the most important activities of purchasing management. The right suppliers will determine whether the purchasing goal for the right product, at the right time, at the right price, in the right quantity and in the right condition, is achieved. Selecting the right supplier might sound simple, but it is a complex decision because each of the above-mentioned purchasing activities influence this decision, as do numerous other factors (within and
outside the enterprise) which need to be taken into account. Selecting the right supplier is important as the wrong decision may have undesirable implications.

The selection of suppliers has become increasingly important in recent years. The establishment of closer ties with fewer suppliers, establishing partnerships, strategic alliances and the implementation of systems such as JIT and MRP are important. According to Giorgio Sabbadin (MD – Formex Engineering, personal communication, 5 October 2003), because there is no stainless steel manufacturer in the Eastern Cape press shops must deal with the various steel merchants that purchase directly from Columbus Stainless Steel. This situation is not advantageous to both price and supplier performance.

According to Hugo and Van Rooyen (1992: 148), selecting the right supplier is, without doubt, one of the most critical aspects of purchasing and materials management. Quality and/or quantity may be perfectly planned, but nothing will come of these plans if the supplier cannot perform at the desired level. The implications involved in selecting poor suppliers include the following:

- out-of-stock situations, resulting in interruptions in production and sales;
- needlessly high prices, resulting in high costs and a lower investment return;
- a weak competitive position in the market place and the possibility of a decline in the firm’s market share; and
• the loss of attractive business opportunities as a result of inadequate supply.

Effective purchasing obviously depends on reputable and capable suppliers, contributing to the achievement of a firm’s objectives. The preferred supplier is very reliable and particularly well positioned to offer a standardised, simplified, uniform performance, coordinated with specific needs (Halley, 2002: 41). More than ever before, the supply chain presents a significant challenge to firms who must develop a logistics system to help enhance product flow throughout their distribution channels.

3.8 QUALITY IN THE SUPPLY CHAIN

According to Hugo and Van Rooyen (1992: 97), determining the exact quality is important for several reasons. Firstly, inherent quality characteristics will affect cost and ultimately the return on investment. Secondly, quality may have marketing implications, for instance, in respect of selling prices, choice of target market, competition and the choice of points of sale. Thirdly, quality decisions will directly affect the other purchasing activities such as selecting suppliers, purchase prices and quantities purchased.

Hugo et al (1997: 132) state that a business management explanation of the concept of quality should reflect the objective of efficiency, particularly the combined optimisation of value and costs. Appropriate quality represents those characteristics determined by value in the market place and the extent to which that quality is suited to the purpose for which the item will be used.
The concept of quality can be described in broad terms either by purely technical or by business-economics. A technical explanation of quality should reflect the inherent characteristics of requirements. Seen from this angle, quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy a given need (Hugo et al, 1997: 102).

According to Schonberger (1985: 490), commitment to quality starts with top management. It is not easy for managers who have a legal or financial background to make a commitment to quality. Managers with operational experience and exposure to the significance of quality have been in short supply within the industry. Top management in most companies is now aware of the problem and, as a result, are sponsoring massive quality control training efforts, sometimes including themselves in the training.

3.9 THE IMPACT OF INFORMATION SHARING

Supply chain management is related to the coordination of products and information flow among suppliers, manufactures, distributors and customers (Zhao, Xie and Zhang, 2000: 24). Information sharing and order co-ordination impacts the supply chain performance affected by demand patterns and capacity tightness. To improve the performance of a supply chain experiencing demand uncertainty, companies in the supply chain need to share information and co-ordinate orders among themselves.
Coyle et al (2003: 23) states that managing the flow of information is a key factor for both efficiency and effectiveness in the supply chain. As previously indicated, it must be a two-directional flow to really maximise the potential of supply chain management. A key characteristic is sharing information up and down the supply chain related to the flow and demand requirements. If information is shared, it has the potential to be available on a real-time basis. If the information also has a high level of integrity and accuracy, then it significantly reduces uncertainty, which in turn, reduces safety stock and obviously lowers inventory.

The world economy has undergone a radical transformation in the past decade with geographical and cultural divides narrowing because of the advent of improved communication skills. These advances have enabled companies to widen both their market and supply sources substantially. (Kotler, 1997: 3).

Global markets have developed because people’s needs and wants are similar. Through new and extensive communication technologies, people throughout the world learn of and express the desire to have many of the same products. As a result, they have sacrificed traditional product preferences for higher-quality, lower-priced products that are more highly standardised. This preference for non-traditional products is due to economic and cultural factors. People are attracted to locally available, reasonably priced, high-quality merchandise. In addition, the opportunity to own or use products that are used in other countries helps people to feel that they enjoy
standards of living that may be comparable to those of more prosperous nations (Coyle et al, 2003: 150).

The consumers in today’s marketplace are enlightened and empowered by the information that they have at their disposal from the Internet and from many other sources (Coyle et al, 2003: 5). Their access to supply sources has expanded dramatically beyond their immediate locale by virtue of catalogues, the Internet, and other media. Consumers have the opportunity to compare prices, quality, and service. They demand competitive prices, high quality, tailored/customised products, convenience, flexibility and responsiveness. They tend to have a low tolerance level for poor quality in products and/or services.

3.10 INVENTORY MANAGEMENT

Material management is a concept that is congruent with the modern view of manufacturing because it organises, co-ordinates and integrates the functions of procurement with the logistics of manufacturing operations. The term “material management” is used interchangeably with “logistics management”. The primary functions of logistics management is the processing of customer orders, inventory management and delivery/transport to the customer. The tools used in order to ensure these activities work effectively are called supply paradigms (Allegri, 1991: 11).

According to Coyle et al (2003: 22), managing the flow and level of inventory is a central focus of supply chain management and acts as a meter to gauge
the success of a business. In simplistic terms, the level of inventory must be sufficient to provide acceptable customer service but low enough to minimise supply chain costs. To maintain the balance between supply of and demand for inventory stock, the supply chain requires integrated management to avoid duplication among members of the supply chain. Close monitoring of inventory as it moves through the supply chain is necessary to reduce or eliminate uncertainty and obviate the necessity for safety stock. This includes visibility of inventory being held in warehouses and other storage facilities as well as inventory in transit.

Hugo et al (1997: 56) defines a materials requirement planning (MRP) system as consisting of a set of logically related procedures, decision rules and records designed to translate a master production schedule into time-phased net requirements and the planned coverage of such requirements, for each component inventory item, needed to implement the schedule.

The prime objective of materials planning is to manage and control inventories of parts, components, semi-finished and finished parts and raw materials that are to be used in the manufacture of products made to order or for stock (Allegri, 1991: 87).

According to Coyle et al (2003: 188), as an asset on the balance sheet of companies, inventory has taken on increased significance because of the strategy of many firms to reduce their investment in fixed assets, that is, plants, warehouses, office buildings, equipment and machinery, and so on.
The reduction in fixed assets has been accomplished through leasing and other outsourcing practices, which has the effect of increasing variable cost. The end result is that the current asset section of the balance sheet has taken on increased relative importance, especially inventory.

The ultimate challenge in managing inventory is balancing the supply of inventory with demand for inventory. In other words, a company would ideally want to have enough inventory to satisfy customer’s demands for its products with no lost sales due to inventory stock outs. However, the company does not want to have too much inventory supply on hand because of the cost of carrying inventory. “Having” is the ultimate objective (Coyle et al, 2003: 189).

According to Deon Horak (GM Logistics – Eberspächer SA, personal communication, 15 September 2003), the cost of the components required for the assembly of both converters and silencers is high in relation to the added value of the assembly process. This equates to the importance of material handling functions in keeping the holding cost to a minimum and thus having good inventory management structures in place.

Muralidharan and Anantharaman (2002: 23) state that the key objective of the purchasing department is to purchase the right quality of material, in the right quantity, from the right source at the right time and at a reasonable price. It can therefore be accepted that quality, cost and on-time delivery are the three most important criteria in supply selection.
According to Hugo et al (1997: 53), JIT is a product-orientated management philosophy perfected by Japanese industrialists to eliminate all forms of waste, whether of time, labour, raw materials or materials. Inventory holding is extremely expensive and ties up working capital that can be used more productively elsewhere in the organisation. The whole JIT system is designed to eliminate inventories of raw materials and purchased products, sub-assemblies and working process and inventories of final products ready for marketing to the customer. This concept is however not working within the catalytic converter industry, as the supply of stainless steel is not consistent (Deon Horak, GM Logistics – Eberspächer SA, personal communication, 15 September 2003).
3.11 SUPPLY CHAIN LEARNING

According to Spekman (2002: 41), the benefits that accrue to firms that effectively manage their supply chain partners range from lower cost to higher returns on investment, to higher returns to stockholders. However, effective management of a supply chain is not easily accomplished.

Figure 3.3: Supply chain learning, its pre-conditions and its effect on performance outcomes

![Diagram](image)

Source: Adapted from Spekman (2002: 42)

Porter (1990: 37), in defining the supply chain, considers every firm as a collection of activities that are performed to design, produce, market, deliver and support products. The individual activities and the way individual activities are performed, reflect its history, strategy and underlying economics.

3.12 FORECASTING DEMAND FLUCTUATIONS

According to Pycraft et al (1997: 411), operational managers must make long, medium and short-term decisions. The first step in capacity planning and task control is to understand and measure the likely fluctuations in demand and the extent of available capacity in the organisation.
The interface between procurement and production planning is an extremely important one. Production planning decisions influence the parameters within which purchasing does its work. The effectiveness with which the purchasing department carries out its job function, directly influences the success of the production planning system (Burt and Dobler, 1996: 514).

It may appear obvious to state that matching customer demand with the supply of the right goods, in the right quantity and at the right time is one of the objectives of forecasting demand fluctuations. It must also be remembered that customer demands have become more exacting with regard to flexible and fast responses which suppliers are expected to provide. Added to this is the fact that product variety and the need to customise offerings have accentuated the difficulties and the basic task of harmonising material flow to meet the basic objective has become more difficult (Saunders, 1997: 206).

3.13 SUMMARY

When an enterprise needs goods or services, the first step is to determine what is required in terms of its intended purpose. This means considering and deciding on the most economic inherent characteristics of requirements and also determining the “right” quality of goods to be purchased. This chapter attempted to find solutions to the second sub-problem by highlighting how to select the best supplier in achieving supply chain leverage and the importance of installing performance measure activities.
The primary function of the supply chain could be said to be the provision of goods and/or services required by customers and to provide appropriate form, time, place and quantity utilities in the package offered. However, the supply chain also acts as a medium for the exchange of information and the communication of orders or instructions (Saunders, 1997: 151).

As mentioned in this chapter, although it is hard to find the ideal supplier, buyers should make every effort to trace the “best” possible supplier. A long-term relationship with the “best” supplier may be of great advantage to both the purchasing enterprise and the supplier. The enterprise should also adhere to agreements and meet supplier expectations.

The researcher is in agreement with Monczka (1998: 1), in summarising this chapter by stating that integrated supply chain strategies recognise the direct link between the control of the supply function and corporate competitiveness. Management of the supply chain involves the integration of all decisions that affect the design and flow of purchased items into and through the organisation to finished products. Internal and external materials decisions become part of a single strategy aimed at winning customers and increasing competitiveness.

Chapter Four will discuss the supply of stainless steel to the Eastern Cape catalytic converter industry in supporting its requirements.
CHAPTER FOUR
THE SUPPLY OF STAINLESS STEEL IN SUPPORTING THE EASTERN CAPE CATALYTIC CONVERTER INDUSTRY

4.1 INTRODUCTION

The aim of this chapter is to assess the impact of sourcing stainless steel from the local South African market. Commercial reasons currently dictate the use of local steel in maintaining profitability while competing on the global market, when viewed in accordance to the MIDP programme guidelines. This chapter will further discuss the third, fourth and fifth sub-problems highlighted in Chapter One. The structure affecting the long-term survival of the catalytic converter industry within South Africa and what knowledgeable people think about the performance of local stainless steel in meeting its demands will be the basis of this chapter.

Van Huyssteen (2002: 18) states that the challenge for the industry is to become truly globally competitive while the MIDP programme protection is still in place. A further challenge is to negotiate better prices for raw material. Shipping of raw materials to other countries for manufacture is not the answer, as it would remove the opportunity to add value and create jobs in South Africa. The only solution would be a price preference which would allow local component manufacturers to source local raw material at cheaper prices.
4.2 THE REBATE CALCULATION

According to Paul Erasmus (MD – Eberspächer SA, personal communication, 9 September 2003), exporters of motor vehicles and components earn incentives based on the local content of exported products. These incentives are awarded by the South African government’s Ministry of Trade and Industry and take the form of import duty credits. The instruments are known as “IRCCs” (Import Rebate Credit Certificate). Applications for IRCCs must be accompanied by audited documentation proving the sale of and payment for exports and a declaration validating the extent of local content in the exported product. The DTI administers claim for export performance.

The value of the IRCC in the hands of the user is a function of import duty which an importer can avoid paying when his goods arrive at a South African port. The import duties applicable on a motor vehicle or components will gradually reduce each year until 2007. To make the South African Automotive Industry progressively more globally competitive the “exchange rate” between IRCCs and the import duty payable is slowly declining. This “exchange rate” is termed the “complementation ratio”.
Table 4.1: The effects of the MIDP Depreciation (1998 to 2007)

<table>
<thead>
<tr>
<th>Year</th>
<th>Component Export Incentive</th>
<th>Complementation Ratio (EEP)</th>
<th>Qualifying PGM’s Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>40.00%</td>
<td>100.00%</td>
<td>90.00%</td>
</tr>
<tr>
<td>1999</td>
<td>37.50%</td>
<td>100.00%</td>
<td>90.00%</td>
</tr>
<tr>
<td>2000</td>
<td>35.00%</td>
<td>100.00%</td>
<td>80.00%</td>
</tr>
<tr>
<td>2001</td>
<td>32.50%</td>
<td>100.00%</td>
<td>60.00%</td>
</tr>
<tr>
<td>2002</td>
<td>30.00%</td>
<td>100.00%</td>
<td>50.00%</td>
</tr>
<tr>
<td>2003</td>
<td>29.00%</td>
<td>94.00%</td>
<td>40.00%</td>
</tr>
<tr>
<td>2004</td>
<td>28.00%</td>
<td>88.00%</td>
<td>40.00%</td>
</tr>
<tr>
<td>2005</td>
<td>27.00%</td>
<td>82.00%</td>
<td>40.00%</td>
</tr>
<tr>
<td>2006</td>
<td>26.00%</td>
<td>76.00%</td>
<td>40.00%</td>
</tr>
<tr>
<td>2007</td>
<td>25.00%</td>
<td>70.00%</td>
<td>40.00%</td>
</tr>
</tbody>
</table>

Source: Paul Erasmus, (MD – Eberspächer SA, personal communication, 9 September 2003)

The value of the IRCC, as generated by an exporter, is directly related to the Eligible Export Performance (EEP) value and is a function of the local content and domestically added value of an exported product. The EEP value is the Freight on Board (FOB) selling price of the export product, less the value of any import content. This calculation is carefully monitored by the DTI and externally audited declarations must to be submitted together with any application for an IRCC (Paul Erasmus, MD – Eberspächer SA, personal communication, 9 September 2003).
It must be noted that specific rules apply with regard to catalytic converter exports. Because of the high value of precious metal coatings (platinum, palladium and rhodium), only 40% of the Precious Groups Metal (PGM) value is regarded as local content, with 60% of the PGM value considered as “imported” content, whether mined in South Africa or not.

**Table 4.2: Calculation of the Eligible Export Performance**

<table>
<thead>
<tr>
<th>Monolith</th>
<th>Full Cost</th>
<th>Imported Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate</td>
<td>$12.00</td>
<td>$7.00</td>
</tr>
<tr>
<td>Coating Charge</td>
<td>$20.00</td>
<td>$8.00</td>
</tr>
<tr>
<td>PGM Value</td>
<td>$55.00</td>
<td>$33.00</td>
</tr>
<tr>
<td>Other</td>
<td>$3.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Sub Total</td>
<td>$90.00</td>
<td>$48.00</td>
</tr>
<tr>
<td>Canning Cost</td>
<td>$10.00</td>
<td>$2.00</td>
</tr>
<tr>
<td>Packaging and Transport to customer</td>
<td>$5.00</td>
<td>N.A</td>
</tr>
<tr>
<td>CIF Selling Price</td>
<td>$105.00</td>
<td>$50.00</td>
</tr>
<tr>
<td>FOB Value</td>
<td>$100.00</td>
<td></td>
</tr>
<tr>
<td><strong>Eligible Export Performance</strong></td>
<td><strong>$50.00</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Paul Erasmus, (MD – Eberspächer SA, personal communication, 9 September 2003)

In the above example, EEP (an IRCC) of $50.00 is generated on the value of one converter, which sells at a CIF of $105.00 to the customer.

**Table 4.3: Value of the Eligible Export Performance (2003 vs, 2007)**

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face Value (IRCC)</td>
<td>$50.00</td>
<td>$50.00</td>
</tr>
<tr>
<td>Complementation ratio</td>
<td>94%</td>
<td>70%</td>
</tr>
<tr>
<td>Reduced usable value</td>
<td>$47.00</td>
<td>$35.00</td>
</tr>
<tr>
<td>Import duty on components</td>
<td>29%</td>
<td>25%</td>
</tr>
<tr>
<td>Avoidable import duty by using the IRCC as substitute</td>
<td>$13.63</td>
<td>$8.75</td>
</tr>
</tbody>
</table>

Source: Paul Erasmus, (MD – Eberspächer SA, personal communication, 9 September 2003)
The previous calculation clearly shows the value of the IRCC in offsetting the payments due for imports, which will reduce annually until 2007.

4.3 MARKET STRUCTURE

According to Baye (2000: 238), the market structure refers to factors such as the number of firms that compete in a market, the relative size of the firms, technology, cost conditions, demand conditions and the ease with which firms can enter or exit the industry. Different industries have different structures and these structures affect the decisions the prudent manager will make.

The supply of local stainless steel in supporting the Eastern Cape catalytic converter industry progresses through the following supply chain:

- Columbus Stainless Steel – manufactures flat sheeting.
- Steel merchants – slit the “mother coil” to the required size.
- Press shop – manipulates steel into components.
- Canners – assembles the converter.
- OEM – exports converters.

Coyle et al (2003: 152) explain that each element is necessary for success in domestic and global markets and the presence of competition in domestic markets motivates individual firms to identify productive marketing, manufacturing and logistics strategies. Creating more competitive business environments, stimulating demand for innovative new products (through the provision of tax credits, for example) placing greater emphasis on R&D and
refocusing trade policies on truly unfair subsidies and trade barriers are strategies for success in global markets.

Table 4.4: Market structure

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Perfect competition</th>
<th>Monopolistic competition</th>
<th>Oligopoly</th>
<th>Monopoly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of firms in industry</td>
<td>Many</td>
<td>Many</td>
<td>Few</td>
<td>One</td>
</tr>
<tr>
<td>Product</td>
<td>Identical</td>
<td>Differentiated</td>
<td>Either few or differentiated</td>
<td>No close substitute</td>
</tr>
<tr>
<td>Barriers to entry</td>
<td>None</td>
<td>Some</td>
<td>Scale and scope economics</td>
<td>Scale and scope economics or legal barriers</td>
</tr>
<tr>
<td>Firm’s control over price</td>
<td>None</td>
<td>Some</td>
<td>Considerable</td>
<td>Considerable or regulated</td>
</tr>
<tr>
<td>Examples</td>
<td>Wheat, corn</td>
<td>Food, clothing</td>
<td>Cars, cereals</td>
<td>Telephone services, gas and electricity</td>
</tr>
</tbody>
</table>

Source: Parkin & King (1995: 345)

According to Parkin and King (1995: 313), a monopoly is an industry in which there is one supplier of a good, service or resource that has no close substitute and in which there is a barrier preventing the entry of new firms. Similarly, there is only one major producer of stainless steel flat product in South Africa. Besides the coated monolith, flat stainless steel product manufactured by Columbus Stainless Steel is the predominant raw material used in the local manufacture of both catalytic converters and silencers.

The catalytic converter industry is compelled to purchase stainless steel products as specified by the system designers. According to the MIDP programme incentive scheme, the steel must be locally made. The industry is therefore forced to purchase the steel from Columbus Stainless Steel, which holds the monopoly.
4.3.1 CANNERS

According to Ruan Botha (Technical Manager – Faurecia, personal communication, 17 October 2003), the canners (Eberspächer SA, Faurecia, Tenneco, Arvin Calsonic) purchase components from the various suppliers (Formex, GBG, Allmay, Eastcape Manufacturers, SPC and Accurate), who manipulate stainless steel flat product into the required components. These components are in the form of tubes, shells, flanges, cones, wire mesh rings, collars and sensor bosses, most of which can be produced locally with locally manufactured stainless steel.

Expansion of local companies, as well as the industry around Port Elizabeth, has stimulated substantial progress among suppliers of components and services. An example of this would be Eberspächer, sourcing the majority of its outsourced components from Port Elizabeth-based suppliers, with many of these components replacing items previously imported. An ever-increasing number of specialised tools, assembly jigs and checking fixtures are being procured from local engineering firms who are similarly demonstrating their capability of matching global standards. Quality and reliability have become world-class within a relatively short period (Nelson Mandela Bay Review 2003/2004, 2003: 41).

4.3.2 COMPONENT SUPPLIERS

Depending on the annual volume of stainless steel used by the respective press shop, the flat product is either bought directly from Columbus Stainless Steel or from a steel merchant. The press shop’s equipment and the tool line-
up dictates the form in which the flat product is supplied. The flat product can be received as coil feed, strips or blanks in satisfying the type specific tooling application (Giorgio Sabbadin – MD Formex Engineering, personal communication, 5 October 2003).

According to Hugo and Van Rooyen (1992: 118), recording the quality of goods on arrival requires efficient inspection. This essentially entails comparing delivered goods with the set standards and reporting on acceptability. By means of inspection, purchasing management endeavours to ensure that the measurements, design, finish, performance and other inherent characteristics of the goods agree with those stated on the order and are suited to the purpose for which they have been ordered.

According to Dietmar Rädel (Owner – Allmay Tooling, personal communication, 3 November 2003), the supply performance of stainless steel is inconsistent and local industry has very little control on sourcing decisions:

With lead-times of up to three months, Allmay is often required to produce components from a batch of material that is delivered late. There is no buffer stock in the supply chain and we (Allmay Tooling) manufacture parts on a hand to mouth basis.

4.3.3 STEEL MERCHANTS

The steel merchants purchase “mother coil” directly from Columbus Stainless Steel in large quantities to satisfy customer requirements. The mother coil
arrives in different gauges (material thickness) and grades (material composition) and must be slit or blanked to satisfy their orders.

The steel merchants are very dependent on Columbus Stainless Steel to supply bulk material timeously in order that they may supply their customers on time. The relationship between Columbus Stainless Steel, the steel merchants and press shops is critical in adding value to the supply chain.

4.3.4 COLUMBUS STAINLESS STEEL

The major producer of locally manufactured stainless steel in South Africa is Columbus Stainless Steel. This company is South Africa's only producer of stainless steel flat products.

Because of the boundless potential for stainless steel as a metal for the future, Columbus Stainless Steel remains dedicated to becoming one of the leading suppliers of stainless steel in our domestic market and the global arena. Acerinox (Spanish company) has a 64% shareholding in Columbus Stainless Steel. The rest of the shares are held equally by Highveld Steel and Vanadium Corporation, Samcor (which is an Anglo American and BHP Billiton Plc joint venture) and the IDC (Industrial Development Corporation of South Africa). Columbus Stainless Steel is situated in Middleburg in the Mpumalanga Province of South Africa. It is a technologically advanced, fully integrated, single-site operation (Columbus Stainless Steel, 2002).
According to Giorgio Sabbadin MD Formex Engineering, personal communication, 5 October 2003), since the Acerinox purchase into Columbus Stainless Steel in 2002, there has been on average a 20% increase across the board in the purchase price of stainless steel products. This unexpected increase in the purchase price of stainless steel has been felt throughout the catalytic converter industry.

According to Columbus Stainless Steel (Columbus Stainless Steel, 2002), “Our customers depend on us and we depend on them. QUALITY is our watchword at all times. We pride ourselves on being consistent with on time delivery, competitive pricing and being able to efficiently and innovatively meet the specifications set”.

Columbus Stainless Steel (Columbus Stainless Steel, 2002) goes on to say, “What sets Columbus apart is our vision for the future of stainless steel in South Africa. Part of our role in growing the local economy is the opportunity for us to attract new investors into the country by offering world-class services and products, while proving our commitment to developing value-adding downstream stainless steel industries”.

4.4 STRATEGIC PARTNERSHIPS
The most important tool used in the purchasing of stainless steel components is an internal strategic partnership system. Hugo et al (1997: 176) explain external strategic partnerships as the strategic supplier partnering in a collaborative way whereby buying firms and a few of their key supplying firms
intensively interact with each other to achieve mutual “win-win” long-term benefits. Although Hugo et al (1997: 176) speak of “external” strategic partnership in characteristics, long-term commitments, confidential information, sharing, co-operative, continued improvement efforts, sharing of risks and rewards. This ensures a reliable operation, which is guaranteed to meet the needs of internal and external customers.

Business relationships between suppliers and purchasing firms are often marred by factors such as scheduled deliveries not been received on time, late payments or poor quality. It is essential that both parties negotiate and jointly arrive at solutions to resolve problem issues.

Similarly, the relationship between Columbus Stainless Steel, the steel merchants and the component manufacturers interacting with the canners is vital in creating a strong supply chain. The questionnaire in Chapter Six will analyse this further.

4.5 PURCHASING FROM A DISTRIBUTOR OR MANUFACTURER

Another issue on which policy is required is whether purchases should be made direct from the manufacturer or from a distributor (industrial intermediary) such as a wholesaler or retailer or agent (Hugo et al, 1997: 152). Purchasing from a distributor may have certain advantages for the enterprise:

- Distributors have specialised product knowledge because they stock various manufacturers’ products;
Because of greater variety, the purchasing enterprise has a wider choice of style, quality, colour, packaging and finish;

- The location of distributors makes shorter lead times and better after sales service possible; and

- Marketing services such as transport, storage, recording, financing and assistance with promotions.

There are merits to using intermediaries because they perform marketing activities. If a distributor does not perform marketing activities such as transport and storage, the enterprise should rather buy direct from the manufacturer. Manufacturers are not usually prepared to supply small quantities direct to enterprises. In this situation it makes better sense to make use of a distributor rather than holding larger stocks.

A large press shop such as GBG Engineering and Formex Engineering are able to order their material requirements direct from Columbus Stainless Steel, financially allowing them to purchase the minimum order quantity stipulated. It is however not possible for smaller press shops such as Accurate and Eastcape Manufacturers to order direct from Columbus Stainless Steel and they must thus rely on steel merchants to procure their smaller volume requirements.

4.6 INTERNATIONAL SOURCING VERSUS LOCAL SOURCING

The concept of globalisation of business organisations is based on gaining a competitive edge by optimising the value added through sourcing
internationally for the best product mix of inputs and on marketing products with world-best characteristics of quality, price and customer satisfaction (Hugo et al, 1997: 308).

Viewed against this global environment and combined with the threat of foreign competition, the need to access emerging global technology and the pressure to attain world-class standards in quality and production costs, South African business must develop standards in quality and production costs and must develop proactive strategies to participate in world markets. International sourcing is an obvious strategy to assist in gaining a competitive advantage in international markets.

As stated previously, Hugo et al (1997: 309) explain that the most important differences between international purchasing and purchasing on the domestic market relate to aspects such as monetary systems, interest rates, inflation, tax systems, language and culture differences and the restrictions placed on the international flow of goods and services by the country’s authorities.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Requirements</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to lower priced goods</td>
<td>Top management support</td>
<td>Diverse business practices</td>
</tr>
<tr>
<td>Access to higher quality goods</td>
<td>Developing communications skills</td>
<td>Nationalistic attitudes/behaviour</td>
</tr>
<tr>
<td>Better delivery performance</td>
<td>Establishing long-term relationships</td>
<td>Culture/language differences</td>
</tr>
<tr>
<td>Better customer service</td>
<td>Knowledge of foreign business practices</td>
<td>Volatile exchange rates</td>
</tr>
<tr>
<td>Help meet counter trade obligations</td>
<td>Foreign supplier certification</td>
<td>Logistics support</td>
</tr>
<tr>
<td>Help develop a foreign presence</td>
<td>Obtaining expert assistance</td>
<td>JIT-sourcing/Stock levels</td>
</tr>
<tr>
<td>Improved competitive position</td>
<td>Planning for global sourcing</td>
<td>Finding the qualified sources</td>
</tr>
<tr>
<td>Increased number of suppliers</td>
<td>Diverse political environments</td>
<td>Customs/duty regulations</td>
</tr>
</tbody>
</table>

Source: Adapted from Hugo et al (1997: 309)
According to Hugo et al (1997: 314), some of the factors hampering the planning of international purchasing are as follows:

- Financial factors such as currency uncertainty, financial policy uncertainties and the financial effect of economic performance;
- Economic factors such as the performance of economic indicators, external dependencies, export/production volatility and gold and currency reserve/import ratio;
- Import duties can disrupt carefully prepared cost estimates at very short notice. Political motives in the importing countries can hamper purchases on specific foreign markets;
- Political factors, such as radical changes in government composition of policies, presence and attitude of opposition groups and the likelihood of a government overthrow;
- Operational environment factors such as the legal structure in the country of export, the rules and procedures governing international trade, trade unions in the exporting country and sociocultural factors; and
- Distances between buyer and seller are extremely important, particularly to South African importers.

International risks are probably the only factors creating the greatest difficulties when it comes to planning for international purchasing. These risks relate to financial risks, economic factors, political risks and risks associated with operational environment.
According to Porter (1990: 103), having a domestic supplier industry is far more preferable than relying even on well-qualified foreign suppliers, as the home market is highly visible to domestic suppliers. Proximity of managerial and technical personnel, along with cultural similarities, tend to facilitate free and open information flow and reduce transaction cost.

South African manufacturers often do not have the manufacturing capacity or flexibility to satisfy peak demand for specific products resulting in purchasers turning to the international markets as a more reliable source of supply. This is however not a financially viable option currently available to the canners, as due to the constraints imposed by the MIDP programme, both catalytic converters and silencers must be manufactured from locally produced stainless steel to qualify for the rebate calculation.

4.7 PRICING STRATEGIES

The underlying basis for the relative price difference that leads to international trade could be traced to differences in supply and/or demand conditions in the two countries. Whether the price ratio between the two countries is taste and preference, supply and demand, different technologies or availability factors, the different prices will again indicate the basis for gainful trade between two countries (Appleyard and Field, 1997: 127).

According to Baye (2000: 10), consumer-producer rivalry occurs because of the competing interests of consumers and producers. Consumers attempt to
negotiate or locate low prices, while producers attempt to negotiate high prices. There are however limits to the ability of these parties to achieve their goals. If a consumer offers a price that is too low, the producer will refuse to sell the product to the consumer. Similarly, if the producer asks a price that exceeds the consumer’s valuation of a product, the consumer will refuse to purchase it. These two forces provide a natural check and balance on the market process even in markets in which the product is offered by a single firm.

Baye (2000: 403) continues by stating that in contrast, firms with market power have some influence over the prices they charge. It is therefore important for a manager, to learn some basic pricing strategies for maximising a firm’s profits.

It is further argued that price levels tend to be very similar for the same products and that profitability is thus largely dependant on input costs. Long-term survival and growth would therefore necessitate a reduction in real unit costs over time and organisations without this ability are likely to experience increased competition (Johnson and Scholes, 1999: 67).

According to Hugo et al (1997: 239), negotiations are time-consuming and the cost of preparing for and conducting the negotiations (in terms of travelling expenses if they are not held at the enterprise and the time-cost of members of staff) is high. Consequently, negotiation should not be considered for all purchasing transactions. The cost of the negotiating process should be
weighed up against the saving or increase in value that negotiations can bring about.

4.8 INFLUENCE FROM GOVERNMENT

According to Hugo and Van Rooyen (1992: 131), the influence of government is an increasingly important factor in decision-making on prices. In South Africa, the authority’s influence is particularly on competition in the market for industrial goods. Secondly, the prices of certain raw materials are subject to direct price control and price fixing. According to Hugo and van Rooyen (1992: 132), it should, however, be taken for granted that price control does provide an important degree of price stability, making the buyer’s planning task considerably easier. Overall, it should be clear from the above brief remarks that government action constitutes an important influence on decision-making relating to prices. As a result, the competent buyer will keep abreast of developments in government policy on competition and price control.

According to Bux Heather (Quality Manager – Eberspächer SA, personal communication, 4 November 2003) the influence of government via the MIDP programme is not protecting the catalytic converter industry from inflated local stainless steel prices since the Acerinox takeover. The MIDP programme stipulates the use of local stainless steel in the manufacture of components, but gives little protection against Columbus Stainless Steel inflating their prices to a common international pricing structure.
Government does not provide the price protection that would allow the industry in South Africa to have a competitive advantage on the raw material naturally found in this country. These raw materials include chrome, nickel and other alloys used in the manufacture of stainless steel.

4.9 SUMMARY

The purchase of large quantities of a specific product can often be successfully concluded by negotiation resulting in substantial savings. This is, however, not being experienced by vendors in the supply chain of locally produced stainless steel.

This chapter identified the market structure surrounding the supply of stainless steel in supporting the catalytic converter industry, together with the effects of local content in the rebate calculation and the pricing strategies imposed.

According to Hugo and van Rooyen (1992: 149), the good supplier takes the initiative in suggesting better ways of servicing customers and attempts to find new ways of developing products and services, which will allow customers to perform their operations more economically. The good supplier will warn ahead of time of material shortages, strikes and anything else that may affect the purchaser’s operations. It will provide technological and other expertise when requested by customers and will remain competitive on a continuing basis. Although it may not be easy to find an “ideal” supplier, it remains the task of purchasing management to find the best available suppliers. Finding
such suppliers would benefit purchasing, particularly on a long-term basis. Constant changing of suppliers wastes time and increases costs.

Viewed against this global environment, combined with the threat of foreign competition, the need to access emerging global technology and the pressure to attain world-class standards in quality and production costs, South African business must develop proactive strategies to participate in world markets (Hugo et al, 1997: 308). International sourcing is an obvious strategy to assist in gaining a competitive advantage in international markets. There is no single policy to recommend using overseas suppliers because there are too many variables involved in such a decision. A policy of buying from overseas suppliers could, however, be questioned if the product or service is readily available locally at competitive prices and is of the desired quality.

Chapter Five will be an empirical study focussed on the supply performance of stainless steel in satisfying the need of the Eastern Cape catalytic converter industry.
CHAPTER FIVE
RESEARCH METHODOLOGY AND DESIGN

5.1 INTRODUCTION

The aim of this chapter is to highlight the process followed to solve the identified sub problems in order to solve the main problem. The research methodology, design and empirical approach are examined.

The main problem identified in Chapter One was to assess the impact of sourcing stainless steel from the domestic market in supporting the long-term strategic competitiveness and survival of the South African catalytic converter industry. Chapter Two and Three of the literature study analysed the forces that yield competitive advantage in an industry, specifically related to the management of the supply chain. The fourth chapter highlighted the conditions under which the local catalytic converter industry obtains stainless steel and the market structure thereof. The information gained from these chapters helped answer the sub-problems highlighted in Chapter One. In order to obtain feedback from supply chain members, an empirical study will be conducted. This chapter outlines how this study will be implemented.

Information gathered from the empirical study, together with information gathered from the literature study, will help formulate a strategy to improve the performance of local steel manufacture. This information, together with the
information gained in the literature study, will help formulate a strategy that the catalytic converter industry can use to sustain competitive advantage in the global market. The method and design of the empirical study will be addressed in this chapter.

5.2 RESEARCH DESIGN

The systematic process of collecting and analysing information in order to increase understanding of the phenomenon under investigation is the definition used by Leedy (1997: 3) in defining the research process.

An empirical study was conducted to identify the performance experienced by vendors in sourcing corrosion resistant stainless steel locally. The empirical study was conducted by means of a questionnaire sent by facsimile to all recognised industries concerned with manufacturing, processing and sourcing corrosion resistant stainless steel within the Eastern Cape catalytic converter industry.

Verhonick and Seaman (1978: 30) state that once a problem has been concretely formulated, a design is developed as a plan for the study, providing the overall framework for collecting the data.

5.3 QUESTIONNAIRE DESIGN AND STRUCTURE

Hussey and Hussey (1997: 161) detail questionnaires as a list of structured questions with a view to eliciting reliable responses from a chosen sample
with the aim of finding out what a selected group of participants do, think or feel. A questionnaire (Annexure 5.3) was developed in order to elicit data from:

- Steel merchants
- Press shops
- Component vendors
- Canners

According to Hussey and Hussey (1997: 163) and Emory and Cooper (1991: 338) the disadvantages of a mail survey include:

- Low response rates
- No researcher intervention for probing or explanation
- Cannot be long or complex
- Respondents returning survey may represent extremes of the population resulting in skewed responses and sample bias in cases of low response

The questionnaire consists of three sections each with a strategic aim.

Section 1 – Performance Measure

- Logistical performance
- Quality performance
- Costing reduction
- Engineering and innovation
- Overall image
Section 2 – Customer Satisfaction Assessment

- Overall assessment of customer satisfaction

Section 3 – Customer Satisfaction

- Customer relationship rating

Using the 5-point Likert scale, the questions were posed with a rating from poor to excellent, with a score of 1 for poor and 5 for excellent.

1 = Poor (Relationship is seriously damaged).
2 = Fair (Constant issues; relationship needs repair).
3 = Moderate (Relationship OK, but needs improvement).
4 = Good (Occasional issues arise but are resolved as they occur).
5 = Excellent (Minimal issues; no barriers to new business; full partnership).

Hussey and Hussey (1997: 166) state that there are two types of questions, either closed or open-ended. Closed questions occur where the respondent's answer is selected from a number of predetermined alternatives. Closed questions are useful for collecting factual data and are easily analysed since the range of potential answers is limited. These sections utilised open-ended questions as each respondent was required to detail information specific to their unique situation and not readily known to the researcher.

According to Aaker, Kumar and Day (1998: 306), although each questionnaire must be designed with a specific research objective in mind, there is a
sequence of logical steps that every researcher must follow to develop a good questionnaire:

- Plan what to measure.
- Formulate questions to obtain the needed information.
- Decide on the order and wording of questions and on the layout of the questionnaire.
- Using a small sample, test the questionnaire for omissions and ambiguity.
- Correct the problems.

5.4 PILOT STUDY

Hague (1994: 95) identifies piloting as a study to identify if any aspects of the questionnaire do not work and tests whether:

- Question wording makes sense and is not ambiguous or vague.
- Questions are relevant to the research topic.
- The layout of the questionnaire is user-friendly.

A pilot study was initially completed to test the questionnaire among five employees of Eberspächer SA. These employees were chosen because of their involvement, including:

- Sourcing components
- Research and development
- Customer liaison
- Costing functions
Once the responses to the pilot study were reviewed, questions that were vague and ambiguous were revised in order to be more user-friendly. For ease of administration, the questionnaire was reduced to two pages including the covering letter (see Annexure 5.1) and the questionnaire (see Annexure 5.3). This was deemed necessary to increase the response rate and simplify the response procedure.

5.5 ADMINISTRATION OF THE EMPIRICAL STUDY

Hussey and Hussey (1997: 163) note that cost is an important element when a decision needs to be made as to the best method to distribute a questionnaire. Distribution methodology is also dependent on the size and location of the sample. As the population to be surveyed is dispersed within the boundaries of the Eastern Cape Province, a facsimile broadcast to each recipient was deemed the most efficient method and would ensure the fastest response rate.

The questionnaire was broadcast by facsimile to 18 organisations on 21 October 2003 with a response deadline of 27 October 2003. An example of the covering letter to the questionnaire is shown in Annexure 5.1. By 27 October 2003 a total of seven responses were received, yielding a response rate of 36.84%.

Emory and Cooper (1991: 333) state that 30% is an acceptable response rate for postal surveys. A follow-up broadcast on Tuesday 28 October 2003
(Annexure 5.2), aimed to increase the response rate, yielded a further seven responses resulting in an overall response rate of 77.78%. The responses received after the follow-up were used as a comparison with the responses initially received in order to test for bias. A summary of the respondents is depicted in Table 5.1.

**Table 5.1: Summary of the respondents from the broadcast audience**

<table>
<thead>
<tr>
<th>Broadcast Audience</th>
<th>Value</th>
<th>Response by 27/10/03</th>
<th>Response by 31/10/03</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canners</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Component manufacturers</td>
<td>11</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Steel merchants</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>18</td>
<td><strong>38.89%</strong></td>
<td><strong>38.89%</strong></td>
</tr>
</tbody>
</table>

Source: Information gathered from returned questionnaires

The lower-than-anticipated response rate may be attributed to two factors:

- Supply chain members’ apathy in responding to the surveys received from the Eberspächer SA facsimile transmission facility.
- Certain vendors not willing to “rock the boat”.

The 5-point Likert scale is the most used form of scaled items where respondents choose a point on a scale that best represents their view (Allison, O’Sullivan, Owen, Rice, Rothwell and Saunders, 1996: 83). Statistical measures will be used to calculate the degree to which the distribution of data is ‘skewed’ in order to summarise the degree of support.

For the sake of this study, a positive skewness would indicate a favourable response to the posed question, while a negative skewness would indicate a
non-favourable response to the posed question. Results in the questionnaire that show no value for skewness, indicate unanimous acceptance of the statement as being moderate, hence no skewness is reflected.

5.6 CONCLUSION

This chapter aimed to detail the research methodology followed in solving the main research problem identified as well as to explain the procedure followed in conducting the empirical study. Chapter Five sets out the planning and execution of the empirical study and analysis of the results of the empirical component of the study. The empirical study was designed in an attempt to persuade respondents to supply information that would assist the researcher to solve the sub-problems and to compile a strategy to solve the main problem.

Results and interpretations for each question were tabled and statements analysed by means of a skewness test. Chapter Six shows a detailed statistical and graphical analysis of the data gleaned from responses and forms the basis for the development of a conclusion in Chapter Seven.
CHAPTER SIX
RESULTS AND DISCUSSION OF THE EMPIRICAL STUDY

6.1 INTRODUCTION
The data collected from the empirical study was analysed using recognised statistical calculations in order that interferences as to the need and impact of the study could be limited.

This chapter identifies key statistical terms to be used in the analysis of the data collected. The data collected from the empirical study is analysed using the Microsoft Excel 2000 statistical analysis tools and presented in tabular and graphical form in this chapter.

6.2 DEFINITION OF STATISTICAL TERMS
Various authors (Emory and Cooper, 1991: 472; Hussey and Hussey, 1997: 203-207) identify key statistical variables to be calculated for analysis of a set of data. This includes a measure of location or central tendency including the mean, median and mode. A measure of spread of data around a central value is determined through calculating the standard deviation. It is necessary to measure the shape of the distributed data by measuring the skewness of data. A definition of each variable used is shown below:

- Mean: The mean is the arithmetic average. It is the sum of the observed values in the distribution divided by the number of observations.
Formula: \[ \mu = \frac{\sum_{i=1}^{n} X_i}{n} \]

where \( X \) is each observed value and \( n \) is the number of the observed value.

- Median: The median is the midpoint of the distribution, which has been arranged in size order.

- Mode: The mode is the most frequently occurring value.

- Skewness: The skewness is a measure of a distribution's deviation from symmetry. When a distribution approaches symmetry, skewness is approximately zero. With a positive skew, skewness will be positive and negative when skewness is negative.

6.3 RESULTS OF STATISTICAL ANALYSIS SECTION I

The results for section I A, of the questionnaire (see Annexure 5.3) are indicated in Table 6.1. The questions posed were:

- What is the accuracy of routine documentation accompanying deliveries?
- What is the occurrence of deliveries meeting scheduled dates?
- How effective is the communication loop and information shared regarding deliveries?
- How readily does your supplier accept rejected stock and replace it?
- How effective is your supplier in reacting to emergencies?

A brief discussion of the data is provided following each table.
Table 6.1: Descriptive statistics for logistics performance

<table>
<thead>
<tr>
<th>Question</th>
<th>N</th>
<th>Average</th>
<th>Median</th>
<th>Mode</th>
<th>Skewness</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>3.79</td>
<td>4</td>
<td>4</td>
<td>-0.028</td>
</tr>
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<td>14</td>
<td>1.64</td>
<td>2</td>
<td>2</td>
<td>0.433</td>
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<tr>
<td>3</td>
<td>14</td>
<td>2.57</td>
<td>2.5</td>
<td>2</td>
<td>0.178</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>2.36</td>
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<td>3</td>
<td>-0.731</td>
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<tr>
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<td>14</td>
<td>2.71</td>
<td>3</td>
<td>3</td>
<td>0.516</td>
</tr>
</tbody>
</table>

Source: Results of section I A - statements relating to the logistical performance of locally sourced stainless steel

The overall rating for this sub-section fell just below a score of 3, but the average for effective logistic performance was improved with high scores received for the first question. In the researcher’s opinion the requirement for accurate documentation accompanying deliveries clouded the overall performance of this sub-section. Question two was rated the worst in this sub-section and clearly identifies that the supply of stainless steel in supporting the catalytic converter industry is perceived as poor among the respondents.

Figure 6.1: Logistics performance

Refer to Annexure 6.1 for statements and results as percentages of the total respondents.
The results for section I B, of the questionnaire are indicated in Table 6.2. The questions posed were:

- What is the warranty offered by your supplier?
- What are the PPM figures forwarded by your supplier?
- What is the reaction time in receiving QPRs and corrective action reports?
- How readily does your supplier accept responsibility for latent deficiencies?

A brief discussion of the data is provided following each table.

Table 6.2: Descriptive statistics for quality performance

<table>
<thead>
<tr>
<th>Question</th>
<th>N</th>
<th>Average</th>
<th>Median</th>
<th>Mode</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
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<td>14</td>
<td>2.86</td>
<td>3</td>
<td>3</td>
<td>0.151</td>
</tr>
</tbody>
</table>

Source: Results of section I B - statements relating to the quality performance of locally sourced stainless steel

From the results it can be concluded that the respondents are in agreement that locally produced stainless steel flat product is perceived as good, but the after sales service in recovering and dealing with quality issues is only rated as fair.
Refer to Annexure 6.1 for statements and results as percentages of the total respondents.

The results for section I C, of the questionnaire are indicated in Table 6.3. The questions posed were:

- How competitive is locally manufactured stainless steel compared to imported stainless steel?
- How effective are cost reduction exercises?
- How competitive is the environment surrounding the manufacture of local stainless steel?
A brief discussion of the data is provided following each table.

**Table 6.3: Descriptive statistics for cost performance**

<table>
<thead>
<tr>
<th>Question</th>
<th>N</th>
<th>Average</th>
<th>Median</th>
<th>Mode</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>1.79</td>
<td>2</td>
<td>2</td>
<td>-1.566</td>
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<tr>
<td>2</td>
<td>14</td>
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<td>0.692</td>
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<td>14</td>
<td>1.71</td>
<td>2</td>
<td>2</td>
<td>0.192</td>
</tr>
</tbody>
</table>

Source: Results of section I C - statements relating to the cost performance of locally sourced stainless steel

The respondents scored this sub-section below average. The scores obtained indicate that the “customers” purchasing stainless steel flat product from local sources do not perceive the product as being competitively priced. The low scoring in this section was because of the across-the-board increase in the price of stainless steel product from Columbus Stainless Steel during 2003.

**Figure 6.3: Cost performance**

Refer to Annexure 6.1 for statements and results as percentages of the total respondents.
The results for section I D of the questionnaire are indicated in Table 6.4.

The questions posed were:

- How effective are benchmarking exercises?
- What is your perception of local produced steel?
- How innovative is local steel manufacture in keeping abreast with international trends?

A brief discussion of the data is provided following each table.

**Table 6.4: Descriptive statistics for engineering and innovation**

<table>
<thead>
<tr>
<th>Question</th>
<th>N</th>
<th>Average</th>
<th>Median</th>
<th>Mode</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>2.71</td>
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<td>2</td>
<td>0.516</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
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<td>3</td>
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<td>0.028</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>2.86</td>
<td>3</td>
<td>3</td>
<td>0.151</td>
</tr>
</tbody>
</table>

Source: Results of section I D - statements relating to the engineering and innovation of locally sourced stainless steel

Similarly to the quality performance sub-section, the respondents perceive both product and supplier as being innovative and able to keep abreast with international trends.

**Figure 6.4: Engineering and innovation**

Refer to Annexure 6.1 for statements and results as percentages of the total respondents.
The results for section I E, of the questionnaire are indicated in Table 6.5.

The questions posed were:

- How flexibility is your supplier?
- How responsive is your supplier?
- How competitive is your supplier’s prices?
- How well does your supplier anticipate your needs?
- How good is your supplier in keeping promises?
- How sincere is your supplier in their desire to serve?

A brief discussion of the data is provided following each table.

**Table 6.5: Descriptive statistics for overall image of the local stainless steel industry**

<table>
<thead>
<tr>
<th>Question</th>
<th>N</th>
<th>Average</th>
<th>Median</th>
<th>Mode</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>1.71</td>
<td>2</td>
<td>2</td>
<td>0.192</td>
</tr>
<tr>
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<td>1.29</td>
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<td>1</td>
<td>1.067</td>
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<tr>
<td>4</td>
<td>14</td>
<td>1.57</td>
<td>2</td>
<td>2</td>
<td>-0.324</td>
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<tr>
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<td>14</td>
<td>1.43</td>
<td>1</td>
<td>1</td>
<td>0.325</td>
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<tr>
<td>6</td>
<td>14</td>
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<td>2</td>
<td>2</td>
<td>0.308</td>
</tr>
</tbody>
</table>

Source: Results of section I E - statements relating to the overall image of locally sourced stainless steel

The overall performance image of the stainless steel supplier to the domestic market has been poorly scored. The respondents were in agreement that the supplier of stainless steel flat product is not flexible or sincere in meeting the requirements of the catalytic converter industry.
Refer to Annexure 6.1 for statements and results as percentages of the total respondents.

6.4 RESULTS OF ANALYSIS SECTION II

This section allowed space for comments on the questionnaire together with scoring according to the 5-point Likert scale system regarding the overall assessment of customer satisfaction.

Table 6.6: Descriptive statistics for overall assessment of customer satisfaction

<table>
<thead>
<tr>
<th>Question</th>
<th>N</th>
<th>Average</th>
<th>Median</th>
<th>Mode</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
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<td>2.07</td>
<td>2</td>
<td>2</td>
<td>-0.024</td>
</tr>
</tbody>
</table>

Source: Results of section II - statements relating to overall assessment of customer satisfaction

The average for this section was recorded as “fair”, with the mode, median and skewness depicting consensus with this finding from the data collected from respondents. The following comments were elicited from respondents in
this section of the questionnaire where the opportunity was given to motivate the respective scoring:

- We are satisfied with the service we receive from our steel merchant, but the feedback, confirmation and supply of steel from Columbus Stainless Steel is poor.
- Our steel merchant (Stalcor) blames everything on Columbus Stainless Steel, but we don’t feel their service is great.
- Columbus Stainless Steel does not care about the local market.
- Columbus Stainless Steel is export orientated; the local market plays second fiddle.
- The service we receive from VRN Steel is excellent. The service from their supplier (Columbus) is however seriously lacking!

6.5 RESULTS OF ANALYSIS SECTION III

This section allowed space for comments on the questionnaire together with scoring according to the 5-point Likert scale system regarding customer relationship rating.

Table 6.7: Descriptive statistics for customer relationship rating

<table>
<thead>
<tr>
<th>Question</th>
<th>N</th>
<th>Average</th>
<th>Median</th>
<th>Mode</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>2.29</td>
<td>2</td>
<td>2</td>
<td>1.067</td>
</tr>
</tbody>
</table>

Source: Results of section III - statements relating to customer relationship rating

The customer relationship ratings posed in section III were also scored as just above “fair”. The following comments were elicited from respondents in this
section of the questionnaire where space was given to motivate the respective scoring:

- VRN Steel staff are always willing to help and go the extra mile. The problems with supply lies with Columbus Stainless Steel.
- Relationship needs repair. Columbus Stainless Steel keeps promising but does not deliver.
- Relationship is OK, but needs more honesty as far as deliveries are concerned.
- Good relationship with sales and quality team but poor relationship with production.
- Although this is a difficult supply chain, a manageable relationship is being maintained.

6.6 SUMMARY

The overall interpretation of a questionnaire based on a rating scale is not always a true reflection of the environment but in this empirical study, it is the researcher’s opinion that the overall image of locally produced stainless steel has been well represented by a wide audience.

Even though the product is perceived as good, the customers purchasing the product are not in a position to place enough pressure on the manufacturer to improve the service and therefore constraints arise under these monopolistic conditions.
CHAPTER SEVEN
CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION
The objective of this research project was to determine the effect of locally produced corrosion resistant stainless steel in supporting the long-term strategic competitiveness and survival of the South African catalytic converter industry.

The major findings of the research project are presented below in an attempt to propose a strategy for dealing with the problems indicated by the title of the project, namely, “An analysis of the performance of a South African stainless steel manufacturer in localising the demand for corrosion resistant steels within the Eastern Cape catalytic converter industry”.

7.2 MAJOR FINDINGS OF THE LITERATURE REVIEW
The survey of literature from secondary sources dealt with the corporate strategy, competitive advantage and supply chain interaction required to achieve economies of scale. The following were highlighted:

- The requirements of the MIDP programme and the rebate calculation.
- Foreign direct investment, competitive rivalry and the market structure.
- Choosing the correct supplier.
• The impact of transport (distance) and customs associated with international sourcing and supply.
• The influence of government in protecting the catalytic converter industry regarding the purchase of precious metals and stainless steel.
• The performance objectives in evaluating the supply chain.
• Lead-times and order quantities in sourcing stainless steel.
• Fluctuation of demand from the international customer.
• Pricing structure of Columbus Stainless Steel.
• The effects of Columbus Stainless Steel selling 64% of their shareholding to Acerinox (Spanish company).
• Implications of sourcing stainless steel locally or internationally.

7.3 MAJOR FINDINGS OF THE EMPIRICAL STUDY

After analysing the questionnaire feedback, the following findings could be listed:

• Documentation, quality, innovation and customer relationship were perceived as moderate to good.
• The overall image of logistical performance in being flexible, the desire to serve, keeping promises and delivering on time was rated as poor.
• Commercially, the pricing structure adopted by Columbus Stainless Steel since the Acerinox buy-in as a major shareholder is perceived as unfavourable among the respondents.
7.4 PROPOSED SUPPLY CHAIN STRATEGIES

After analysing the literature review, together with the questionnaire feedback, the following supply chain proposals can be suggested to improve performance of locally produced corrosion resistant stainless steel in supporting the long-term strategic competitiveness and survival of the South African catalytic converter industry:

- Designers of converters and silencers must attempt to standardise the material in accordance with the current high runners of stainless steel products produced by Columbus Stainless Steel.
- The converter industry must insist on timeous orders from international customers to allow timeous sourcing of stainless steel components from the local market.
- Press shops should manufacture tooling that allows flexibility in the form in which stainless steel is received and processed.
- The South African government should regulate the pricing strategies currently employed by the new shareholders of Columbus Stainless Steel in the selling of stainless steel to the local market.
- The South African government should offer additional protection to the catalytic converter industry via the MIDP programme, in view of the monopoly held by Columbus Stainless Steel.
- The South African government should investigate policy changes with regard to the locally mined raw material used in the production of
stainless steel marketed at international rates by Columbus Stainless Steel.

- The South African government should re-evaluate both the MIDP programme and the conditions related to local content if the catalytic converter industry is to remain competitive on the international market while being forced to purchase products manufactured by Columbus Stainless Steel.

- Columbus Stainless Steel should offer preferential rates for the sale of stainless steel to the local catalytic converter industry to allow the long-term strategic competitiveness and survival of this industry.

- Columbus Stainless Steel should improve the overall image of their supply performance and their desire to serve the local market.

- Columbus Stainless Steel should investigate methods of manufacturing and selling smaller order quantities to the local market. This will reduce the holding costs and lead-times currently experienced by the vendors in the stainless steel supply chain.

### 7.5 LIMITATIONS OF RESEARCH

The study, in examining the performance of a South African steel manufacturer in localising the demand for corrosion resistant steels within the Eastern Cape catalytic converter industry has the following limitations:
• The South African catalytic converter industry is limited to the support it receives from the international market and therefore its demand for stainless steel.

• Exchange rate fluctuations make it difficult to predict what the future holds for the catalytic converter industry in South Africa and therefore its demand for stainless steel.

• Specific and general economics such as gold, PGM and oil prices effecting the viability of producing converters in South Africa and therefore the demand on stainless steel.

• A decision made by government regarding the MIDP programme could dramatically change the findings of the project.

• The worldwide demand for motor vehicle.

• Legislation regarding the use of catalytic converts in countries such as South Africa and Australia.

• Politically and labour instability in South Africa could affect the future investment in the catalytic converter industry and therefore the demand for stainless steel.

• The introduction of new technology in vehicles that require no silencer or converter (eg. Electrically powered engines) would also decrease the demand on stainless steel.
7.6 CONCLUDING REMARKS

The Eastern Cape catalytic converter industry has shown tremendous growth in the past few years and requires large quantities of stainless steel to satisfy their customer orders. The demand for flat stainless steel product is there, but Columbus Stainless Steel has more interest in exporting their product at international rates than in offering the local market a competitive price.

With the decline in the incentives offered by the MIDP programme, local industry would be purchasing raw material from the best performing supplier, which could be of either local or international origin. Once the MIDP incentives become negligible, the possibility of having to import stainless steel flat product becomes a reality if Columbus Stainless Steel or the South African government does not protect the local catalytic converter industry.
REFERENCES


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*Columbus Stainless Steel [Online]. Available from:*
http://www2.columbus.co.za [accessed: 28 June 2002].


ANNEXURES

ANNEXURE 3.1: MONTHLY SUPPLIER PERFORMANCE RATING – GOOD SUPPLIER
ANNEXURE 3.2: MONTHLY SUPPLIER PERFORMANCE RATING – POOR SUPPLIER

Eberspacher South Africa (Pty)Ltd.

AUTOPipe
SUPPLIER DEVELOPMENT

MONTHLY SUPPLIER PERFORMANCE: SEPTEMBER 2003

LOGISTIC REPORT

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PPM-actual moving average for six months

PPM-MONTHLY PPN

LOGIC Rating

RATING

DEMERIT

3

ZERO

REASONS FOR DEMERIT/COMMENTS

SUPPLIER COMMITMENT

TARGET <50% TO BE MAINTAINED

ESA REP.

DATE: 01/2003

COMMENTS: No new business to be allocated until major improvements are made.

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21st October 2003

Dear Sir

QUESTIONNAIRE RELATED TO THE PERFORMANCE OF LOCALLY MANUFACTURED STAINLESS STEEL IN SOUTH AFRICA

Eberspächer South Africa is conducting a survey to determine the performance of locally produced stainless steel in satisfying the catalytic converter industry. Following your response to this questionnaire, information can be analysed and recommendations can be made to optimize the current supply chain.

Please complete the attached form and return it by 27th of October 2003.

Awaiting your kind response,

[Signature]

R.P. Sohne
Project Planning
Fax: 041 4862329
ANNEXURE 5.2: COVERING LETTER (FOLLOW-UP)

Eberspächer South Africa (Pty) Ltd
PO BOX 3031
ESTADIAL
6912
223 Gnamanstown Road
Dorn Park
Port Elizabeth
Tel (+27) (0) 41 4062301
Fax (+27) (0) 41 4662329
Page 1 of 2

28th October 2003

Dear Sir

QUESTIONNAIRE RELATED TO THE PERFORMANCE OF LOCALLY MANUFACTURED STAINLESS STEEL IN SOUTH AFRICA

Eberspächer South Africa is conducting a survey to determine the performance of locally produced stainless steel in satisfying the catalytic converter industry. Following your response to this questionnaire, information can be analysed and recommendations can be made to optimize the current supply chain.

Please complete the attached form and return it by 31st of October 2003.

Awaiting your kind response,

[Signature]
R. P. Sondi
Project Planning
Fax – 041 4662329

[Director: Dr G. Kraussmeyer (Chairman), W. F. B. S., P. V. J. I., P. T. T. (Managing), F. K. M.] 
("German")
ANNEXURE 5.3: QUESTIONNAIRE

Sourcing Locally Manufactured Stainless Steel - SA

Company Name: [ ] Supplier: [ ] Date: [ ]

I. Performance Measure

A. Logistics Performance
   1. What is the accuracy of route documentation accompanying deliveries?
   2. What is the occurrence of deliveries meeting scheduled dates?
   3. How effective is the communication loop and information shared regarding deliveries?
   4. How readily does your supplier accept rejected stock and return it?
   5. How effective is your supplier in reacting to emergencies?

B. Quality Performance
   1. The warranty offered by your supplier is?
   2. The PPM figures forwarded by your supplier are?
   3. What is the reaction time in receiving QPRs and corrective action reports?
   4. How readily does your supplier accept responsibility for latent deficiencies?

C. Cost Performance
   1. Commercially, how competitive is local steel compared to imported steel?
   2. How effective are cost reduction exercises?
   3. How innovative is the environment surrounding the manufacture of local stainless steel?

D. Engineering and Innovation
   1. How effective are benchmark exercises?
   2. What is your perception of local product steel?
   3. How innovative is local steel manufacture in keeping abreast with international trends?

E. Overall Image of the Local Stainless Steel Industry
   1. Flexibility
   2. Responsiveness
   3. Price competitiveness
   4. Anticipating our needs
   5. Keeping promises
   6. Sincere in their desire to serve

II. Customer Satisfaction Assessment

Overall assessment of customer satisfaction

Comments

III. Customer Satisfaction

Customer Relationship Rating

Comments

1 = Poor - Relationship is seriously damaged
2 = Fair - Constant issues, relationship needs repair
3 = Moderate - Relationship OK, business improvement, some dissatisfaction
4 = Good - Coupled low rated issues resolved as they occur
5 = Excellent - Minimal issues, no tendency to view business as full partnership

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ANNEXURE 6.1: FREQUENCY TABLES OF THE RESULTS OF THE QUESTIONNAIRE

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<td>2. What is the occurrence of deliveries meeting scheduled dates?</td>
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CHAPTER ONE

PROBLEM STATEMENT AND RESEARCH DEFINITION

1.1 INTRODUCTION

Until the early 1990’s, the only demand for exhaust systems came from the local Original Equipment Manufacturers (OEMs) in South Africa which supported the domestic market. The situation however dramatically changed with the introduction of the Motor Industry Development Programme (MIDP), which created sufficient incentives for the manufacture and export of automotive components from South Africa, including catalytic converters and silencers which become viable export products.

Although this developing market has not been created from the natural supply and demand forces, the catalytic converter industry continues to grow and many organisations are making huge investments in this sector. The MIDP programme has artificially stimulated the industry through the financial gains generated via rebate certificates. The performance of local steel producers, together with the extent to which the export rebates are scaled down over the next few years by local government, will be the major factor contributing to the future of the South African catalytic converter industry.
1.2 MAIN PROBLEM

The main problem to be researched in this project is as follows:

What is the effect of locally produced corrosion resistant stainless steel in supporting the long-term strategic competitiveness and survival of the South African catalytic converter industry?

Government has realised the benefits of engaging in international trade and being recognised as an international player. With the advent of the democratic government in South Africa, all forms of trade restrictions imposed on the country have been withdrawn and foreign trading partners are actively encouraged to support the new South African government’s endeavours to rebuild the economy.

Government has followed the new trade theory in promoting the export of locally manufactured goods. Certain regulations have also been put in place to restrict the importation of other products in order to protect local manufacturers to a certain extent.

1.3 SUB-PROBLEMS

In an attempt to solve the main problem, the following sub-problems will be discussed:
• What are the competitive factors in the South African catalytic converter industry that may be leveraged through the use of locally sourced stainless steel?

• What supply chain management strategies can be leveraged in promoting the competitive advantage of manufacturing catalytic converters within South Africa?

• How does the structure of the South African stainless steel industry impact on the long-term survival of the local catalytic converter industry?

• How do South African customer organisations rate the supply performance of locally manufactured stainless steel?

• What factors do knowledgeable people from the catalytic converter industry believe can contribute to improving the performance of locally manufactured stainless steel?

1.4 SIGNIFICANCE OF RESEARCH

The procurement of raw materials at a competitive price and high levels of quality and timeliness of delivery are vital ingredients in satisfying customer needs. The presence of numerous catalytic converter companies within South Africa places enormous pressure on the relatively few ‘A’ grade suppliers of raw materials, components, press parts and sub-assemblies. The current situation does not allow for competition in the market place leading to higher prices.
The recent sale of Columbus Stainless Steel to a Spanish company (Acerinox) and the effects this has had on product ranges, flexibility, lead times and pricing structures will be highlighted.

This project will identify the performance of the major supplier of stainless steel in meeting the customer requirements in leveraging competitive advantage.
CHAPTER TWO

THE THEORY OF CORPORATE STRATEGY AND COMPETITIVE ADVANTAGE IN THE CATALYTIC CONVERTER INDUSTRY

2.1 INTRODUCTION

Hamel and Prahalad (1994: 125) view strategy as the stretch between the companies existing resources and its ambitions. Strategy is thus seen as the development of a view of the future and shaping the company and its environment to that view. Gaining a strategic advantage over competitors is a key part of survival and logistics are seen to play a role in helping to gain that competitive advantage. Understanding how to gain competitive advantage and how logistics can contribute to the success of the catalytic converter industry will be discussed in this chapter.

South Africa is situated far from its’ export markets and is required to land the product at the customers’ location and to include transport, insurance and finance charges at a competitive rate. The challenge for the industry is to become truly globally competitive while the MIDP programme protection is still in place (Paul Gerrard - Manager Export Operation Delta, personal communication, 28 September 2003).

With the rapid increase in the export of South African manufactured vehicles, the automotive component industry is showing enormous growth. Vehicle manufacturers who do not have local infrastructure are forced to link with the
local industry to acquire export credits in order to become competitive. This normally requires an investment in the component infrastructure. Once the MIDP programme is phased out, the industry will have to compete on its own ability, with only inbound logistics and possibly a minor import duty offering protection against imported competition. The need for corporate strategy in achieving competitive advantage within the catalytic converter industry is vital for future survival (Van Huyssteen, 2002: 18).

According to Johnson and Scholes (1999: 19), strategic analysis aims to identify the key factors, which influence the present and future wellbeing of an organisation. These influences include the geographical and economic environment, together with the strategic capability in terms of resources and competencies internal to the organisation.

Goldman et al (1994: 72) state that the competitive advantage of modern industry is not due to the exploitation of technology but the way in which people, organisations and technology are coordinated to form new business entities.

2.2 MOTOR INDUSTRY DEVELOPMENT PROGRAMME

Although export incentives available in terms of the MIDP programme do not provide a cash incentive to the exporters, they do provide a very attractive facility to foreign OEMs whereby they can competitively market their vehicles in South Africa if they engage in an exchange of trade with domestic component makers. In so doing, the domestic government seeks to expand
and develop those sectors of the local motor vehicle manufacturing industry which are globally competitive and sustainable in the long term.

Plummer (2002) states that the reason for exponential growth of the MIDP programme is that every export generates an equal value of imports, either via components or motor vehicles. Renault, Honda, MG, Rover, Peugeot and other motor vehicle manufactures have all publicly stated that without the export credits to offset import duty they would be unable to successfully export to South Africa. Passenger vehicle imports have grown rapidly and account for more than 30% of the domestic market sales. Export growth has therefore replaced growth in the domestic market rather than complementing it (Plummer, 2002).

Statistics show phenomenal growth since 2000, reflecting the success of the MIDP programme. South Africa’s automotive sector has seen phenomenal growth in recent years, with the value of exports doubling from R20bn in 2000 to R40bn in 2003, according to new statistics published by the Automotive Industry Export Council. The statistics reflect the success of the export-promoting MIDP although the pace of export growth may decrease in the future because of the strong Rand and the depressed global economy (Fraser, 2003).
2.3 GLOBALISATION AND ECONOMIES OF SCALE

The concept of globalisation of business organisations is based on gaining a competitive edge by optimising the value added through sourcing internationally for the best product mix of inputs and on marketing products with world-best characteristics of quality, price and customer satisfaction (Hugo et al, 1997: 308).

Economies of scale in production means that production at a larger scale can be achieved at lower cost. Economies of scale are most likely to be found in industries with large fixed costs in production. For example, fixed costs arise when large amounts of capital equipment must be put in place even if only one unit is to be produced and the cost of this equipment must still be paid even with zero output. The larger the output, the more the equipment costs can be amortised over the larger volume. Large fixed costs and hence economies of scale are prevalent in highly capital-intensive industries such as chemicals, petroleum, steel and automobiles to mention but a few (Suranovic, 2002).

A portion of the rebate value is used on many projects to offset the transportation costs incurred in delivering the catalytic converter to the international customer. Transport costs and sourcing decisions play a vital role in acquiring raw material and delivering the final product through the supply chain (Deon Horak - General Manager Logistics Eberspächer SA, personal communication, 15 September 2003).
Coyle et al (2003: 63) argue that competition is frequently narrowly interpreted only in terms of price competition. While the price issue is certainly important in many markets, customer service can be a very important form of competition. For example, if a company can reliably provide customers with its products in a relatively short time period, then its customers can often minimise inventory cost. A company should consider minimising buyer inventory costs to be just as important as keeping product prices low, since minimising such costs will contribute to more profit or in turn enable the seller to be more competitive. Customer service is therefore of great importance to the logistics area.

Lourens (2002) confirms that foreign companies are looking at setting up plants in Port Elizabeth by 2003. One important concern for the industry about the forthcoming review is the percentage of government incentives regarding local content. Government is however reducing this percentage to stem growth in the catalytic converter sector in an effort to attract investment over a range of components. Its aim is to build large automotive component sectors, as opposed to a large catalytic converter sector. The sector already accounts for just under half of all automotive components exported from South Africa.

Bruce (2003: 75) states that, according to the DTI, South Africa has much to offer foreign companies. Government support for the automotive industry, based on a recent study by Deloitte and Touché (Bruce, 2003: 75), is in line with most developed nations. Government offers a range of supply-side
measures to encourage investment, development and growth. Bruce (2003: 76) goes on to say that all seven South African-based assemblers are encouraging local investment by the components industry. Bruce (2003: 76) says, “I can promise you that the OEMs have a fundamental interest in maximising local content.”

According to the Nelson Mandela Bay Review 2003/2004 (2003: 53), stainless steel components have proved to be one of the more competitive and successful automotive exports. Factors that keep South Africa ahead include its production of more than 50% of the world’s chromium – a catalyst in the manufacture of stainless steel – as well as low electricity, labour and structural costs. The raw material supply is guaranteed for the foreseeable future and a consortium from Europe plans to commission a new stainless steel plant that will contribute about 5% of the world’s stainless steel production.

2.4 SUMMARY

The first sub-problems have been addressed in this chapter by examining the factors that can be leveraged in gaining competitive advantage in producing catalytic converters in South Africa. The chapter also explained the aspects that effect corporate strategy and globalisation in an enterprise. The theory analysed confirms that there is competitive advantage to be derived if competitive raw material is sourced. Companies striving to build sustainable competitive advantage need to deliver higher customer value and satisfaction,
which leads to high repeat purchases and therefore high company profitability for these organisations.

Spekman (2002: 47) concludes that both customer focus and customer satisfaction indicate the importance of looking to the end-user as the final arbiter of competitive advantage.
CHAPTER THREE

SUPPLY CHAIN MANAGEMENT

3.1 INTRODUCTION

The supply chain is a complex and interconnected network of relationships, which exists between individuals and companies, in order to transmit physical products and services in exchange for value. These networks of relationships, based on the transmission of physical products or services to the ultimate consumer, exist only because of this exchange of value (Cox, 1997: 208).

Basnet (2003: 57) concludes that supply chain management is a relatively new concept involving the integration of all the value-creating elements in the supply, manufacture and distribution process, from raw material extraction, through the transformation process, to the end-user consumption. The activities are motivated by the ideals of customer service, compression of lead-time and inventory reduction. The aim of the supply chain is more to improve the quality and cost of the purchased product than to improve the capability of the supplier.

3.2 KEY PERFORMANCE INDICATORS

Key Performance Indicators can help organisations make the most measurement by focusing everyone’s attention on what matters most to the customer (Carman and Conrad, 2000: 90). These measurements provide organisations with the yardstick that indicate whether it is meeting the
expectations of customers. They often provide early warnings long before the profit impact of not meeting customer requirements affects the financial statement.

The consideration of customer needs also has particular significance in the objectives of all operations because the fundamental purpose of operations is to create goods and services in such a way as to meet the needs of their customers. Customer needs provide insight into the importance of particular objectives, while the performance and activities of competitors assist in determining achieved performance.

3.3 SUMMARY

When an enterprise needs goods or services, the first step is to determine what is required in terms of its intended purpose. This means considering and deciding on the most economic inherent characteristics of requirements and also determining the “right” quality of goods to be purchased. This chapter attempted to find solutions to the second sub-problem by highlighting how to select the best supplier in achieving supply chain leverage and the importance of installing performance measure activities.

The primary function of the supply chain could be said to be the provision of goods and/or services required by customers and to provide appropriate form, time, place and quantity utilities in the package offered. However, the supply chain also acts as a medium for the exchange of information and the communication of orders or instructions (Saunders, 1997: 151).
The researcher is in agreement with Monczka (1998: 1), in summarising this chapter by stating that integrated supply chain strategies recognise the direct link between the control of the supply function and corporate competitiveness. Management of the supply chain involves the integration of all decisions that affect the design and flow of purchased items into and through the organisation to finished products. Internal and external materials decisions become part of a single strategy aimed at winning customers and increasing competitiveness.
CHAPTER FOUR
THE SUPPLY OF STAINLESS STEEL IN SUPPORTING THE
EASTERN CAPE CATALYTIC CONVERTER INDUSTRY

4.1 INTRODUCTION
Van Huyssteen (2002: 18) states that the challenge for the industry is to become truly globally competitive while the MIDP programme protection is still in place. A further challenge is to negotiate better prices for raw material. Shipping of raw materials to other countries for manufacture is not the answer, as it would remove the opportunity to add value and create jobs in South Africa. The only solution would be a price preference which would allow local component manufacturers to source local raw material at cheaper prices.

4.2 THE REBATE CALCULATION
According to Paul Erasmus (MD – Eberspächer SA, personal communication, 9 September 2003), exporters of motor vehicles and components earn incentives based on the local content of exported products. These incentives are awarded by the South African government’s Ministry of Trade and Industry and take the form of import duty credits. The instruments are known as “IRCCs” (Import Rebate Credit Certificate). Applications for IRCCs must be accompanied by audited documentation proving the sale of and payment for
exports and a declaration validating the extent of local content in the exported product. The DTI administers claim for export performance.

The value of the IRCC in the hands of the user is a function of import duty which an importer can avoid paying when his goods arrive at a South African port. The import duties applicable on a motor vehicle or components will gradually reduce each year until 2007. To make the South African Automotive Industry progressively more globally competitive the “exchange rate” between IRCCs and the import duty payable is slowly declining. This “exchange rate” is termed the “complementation ratio”.

The value of the IRCC, as generated by an exporter, is directly related to the Eligible Export Performance (EEP) value and is a function of the local content and domestically added value of an exported product. The EEP value is the Freight on Board (FOB) selling price of the export product, less the value of any import content. This calculation is carefully monitored by the DTI and externally audited declarations must to be submitted together with any application for an IRCC (Paul Erasmus, MD – Eberspächer SA, personal communication, 9 September 2003).

4.3 THE SUPPLY CHAIN

The catalytic converter industry is compelled to purchase stainless steel products as specified by the system designers. According to the MIDP programme incentive scheme, the steel must be locally made. The industry is
therefore forced to purchase the steel from Columbus Stainless Steel, which holds the monopoly.

Acerinox (Spanish company) has a 64% shareholding in Columbus Stainless Steel. The rest of the shares are held equally by Highveld Steel and Vanadium Corporation, Samcor (which is an Anglo American and BHP Billiton Plc joint venture) and the IDC (Industrial Development Corporation of South Africa). Columbus Stainless Steel is situated in Middleburg in the Mpumalanga Province of South Africa. It is a technologically advanced, fully integrated, single-site operation (Columbus Stainless Steel, 2002). Since the Acerinox purchase into Columbus Stainless Steel in 2002, there has been on average a 20% increase across the board in the purchase price of stainless steel products. This unexpected increase in the purchase price of stainless steel has been felt throughout the catalytic converter industry.

Business relationships between suppliers and purchasing firms are often marred by factors such as scheduled deliveries not being received on time, late payments or poor quality. It is essential that both parties negotiate and jointly arrive at solutions to resolve problem issues. Similarly, the relationship between Columbus Stainless Steel, the steel merchants and the component manufacturers interacting with the canners is vital in creating a strong supply chain.
4.4 INTERNATIONAL SOURCING VERSUS LOCAL SOURCING

The concept of globalisation of business organisations is based on gaining a competitive edge by optimising the value added through sourcing internationally for the best product mix of inputs and on marketing products with world-best characteristics of quality, price and customer satisfaction (Hugo et al, 1997: 308).

Viewed against this global environment and combined with the threat of foreign competition, the need to access emerging global technology and the pressure to attain world-class standards in quality and production costs, South African business must develop standards in quality and production costs and must develop proactive strategies to participate in world markets. International sourcing is an obvious strategy to assist in gaining a competitive advantage in international markets.

South African manufacturers often do not have the manufacturing capacity or flexibility to satisfy peak demand for specific products resulting in purchasers turning to the international markets as a more reliable source of supply. This is however not a financially viable option currently available to the canners, as due to the constraints imposed by the MIDP programme, both catalytic converters and silencers must be manufactured from locally produced stainless steel to qualify for the rebate calculation.
4.5 PRICING STRATEGIES

The underlying basis for the relative price difference that leads to international trade could be traced to differences in supply and/or demand conditions in the two countries. Whether the price ratio between the two countries is taste and preference, supply and demand, different technologies or availability factors, the different prices will again indicate the basis for gainful trade between two countries (Appleyard and Field, 1997: 127).

According to Baye (2000: 10), consumer-producer rivalry occurs because of the competing interests of consumers and producers. Consumers attempt to negotiate or locate low prices, while producers attempt to negotiate high prices. There are however limits to the ability of these parties to achieve their goals. If a consumer offers a price that is too low, the producer will refuse to sell the product to the consumer. Similarly, if the producer asks a price that exceeds the consumer’s valuation of a product, the consumer will refuse to purchase it. These two forces provide a natural check and balance on the market process even in markets in which the product is offered by a single firm.

Baye (2000: 403) continues by stating that in contrast, firms with market power have some influence over the prices they charge. It is therefore important for a manager, to learn some basic pricing strategies for maximising a firm’s profits.
It is further argued that price levels tend to be very similar for the same products and that profitability is thus largely dependant on input costs. Long-term survival and growth would therefore necessitate a reduction in real unit costs over time and organisations without this ability are likely to experience increased competition (Johnson and Scholes, 1999: 67).

According to Hugo et al (1997: 239), negotiations are time-consuming and the cost of preparing for and conducting the negotiations (in terms of travelling expenses if they are not held at the enterprise and the time-cost of members of staff) is high. Consequently, negotiation should not be considered for all purchasing transactions. The cost of the negotiating process should be weighed up against the saving or increase in value that negotiations can bring about.

4.6 INFLUENCE FROM GOVERNMENT

According to Hugo and Van Rooyen (1992: 131), the influence of government is an increasingly important factor in decision-making on prices. In South Africa, the authority’s influence is particularly on competition in the market for industrial goods. Secondly, the prices of certain raw materials are subject to direct price control and price fixing. According to Hugo and van Rooyen (1992: 132), it should, however, be taken for granted that price control does provide an important degree of price stability, making the buyer’s planning task considerably easier. Overall, it should be clear from the above brief remarks that government action constitutes an important influence on decision-making relating to prices. As a result, the competent buyer will keep
abreast of developments in government policy on competition and price control.

According to Bux Heather (Quality Manager – Eberspächer SA, personal communication, 4 November 2003) the influence of government via the MIDP programme is not protecting the catalytic converter industry from inflated local stainless steel prices since the Acerinox takeover. The MIDP programme stipulates the use of local stainless steel in the manufacture of components, but gives little protection against Columbus Stainless Steel inflating their prices to a common international pricing structure.

Government does not provide the price protection that would allow the industry in South Africa to have a competitive advantage on the raw material naturally found in this country. These raw materials include chrome, nickel and other alloys used in the manufacture of stainless steel.

4.7 SUMMARY

According to Hugo and van Rooyen (1992: 149), the good supplier takes the initiative in suggesting better ways of servicing customers and attempts to find new ways of developing products and services, which will allow customers to perform their operations more economically. The good supplier will warn ahead of time of material shortages, strikes and anything else that may affect the purchaser's operations. It will provide technological and other expertise when requested by customers and will remain competitive on a continuing basis. Although it may not be easy to find an “ideal” supplier, it remains the
task of purchasing management to find the best available suppliers. Finding such suppliers would benefit purchasing, particularly on a long-term basis. Constant changing of suppliers wastes time and increases costs.

Viewed against this global environment, combined with the threat of foreign competition, the need to access emerging global technology and the pressure to attain world-class standards in quality and production costs, South African business must develop proactive strategies to participate in world markets (Hugo et al, 1997: 308). International sourcing is an obvious strategy to assist in gaining a competitive advantage in international markets. There is no single policy to recommend using overseas suppliers because there are too many variables involved in such a decision. A policy of buying from overseas suppliers could, however, be questioned if the product or service is readily available locally at competitive prices and is of the desired quality.
CHAPTER FIVE
RESEARCH METHODOLOGY AND DESIGN

5.1 INTRODUCTION

The main problem identified in Chapter One was to assess the impact of sourcing stainless steel from the domestic market in supporting the long-term strategic competitiveness and survival of the South African catalytic converter industry. Chapter Two and Three of the literature study analysed the forces that yield competitive advantage in an industry, specifically related to the management of the supply chain. The fourth chapter highlighted the conditions under which the local catalytic converter industry obtains stainless steel and the market structure thereof. The information gained from these chapters helped answer the sub-problems highlighted in Chapter One. In order to obtain feedback from supply chain members, an empirical study will be conducted. This chapter outlines how this study will be implemented.

Information gathered from the empirical study, together with information gathered from the literature study, will help formulate a strategy to improve the performance of local steel manufacture. This information, together with the information gained in the literature study, will help formulate a strategy that the catalytic converter industry can use to sustain competitive advantage in the global market.
5.2 CONCLUSION

The empirical study was designed in an attempt to persuade respondents to supply information that would assist the researcher to solve the sub-problems and to compile a strategy to solve the main problem.

Results and interpretations for each question were tabled and statements analysed by means of a skewness test. Chapter Six shows a detailed statistical and graphical analysis of the data gleaned from responses and forms the basis for the development of a conclusion in Chapter Seven.
CHAPTER SEVEN
CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION
The objective of this research project was to determine the effect of locally produced corrosion resistant stainless steel in supporting the long-term strategic competitiveness and survival of the South African catalytic converter industry.

The major findings of the research project are presented below in an attempt to propose a strategy for dealing with the problems indicated by the title of the project, namely, “An analysis of the performance of a South African stainless steel manufacturer in localising the demand for corrosion resistant steels within the Eastern Cape catalytic converter industry”.

7.2 MAJOR FINDINGS OF THE LITERATURE REVIEW
The survey of literature from secondary sources dealt with the corporate strategy, competitive advantage and supply chain interaction required to achieve economies of scale. The following were highlighted:

- The requirements of the MIDP programme and the rebate calculation.
- Foreign direct investment, competitive rivalry and the market structure.
- Choosing the correct supplier.
• The impact of transport (distance) and customs associated with international sourcing and supply.

• The influence of government in protecting the catalytic converter industry regarding the purchase of precious metals and stainless steel.

• The performance objectives in evaluating the supply chain.

• Lead-times and order quantities in sourcing stainless steel.

• Fluctuation of demand from the international customer.

• Pricing structure of Columbus Stainless Steel.

• The effects of Columbus Stainless Steel selling 64% of their shareholding to Acerinox (Spanish company).

• Implications of sourcing stainless steel locally or internationally.

7.3 MAJOR FINDINGS OF THE EMPIRICAL STUDY

After analysing the questionnaire feedback, the following findings could be listed:

• Documentation, quality, innovation and customer relationship were perceived as moderate to good.

• The overall image of logistical performance in being flexible, the desire to serve, keeping promises and delivering on time was rated as poor.

• Commercially, the pricing structure adopted by Columbus Stainless Steel since the Acerinox buy-in as a major shareholder is perceived as unfavourable among the respondents.
7.4 PROPOSED SUPPLY CHAIN STRATEGIES

After analysing the literature review, together with the questionnaire feedback, the following supply chain proposals can be suggested to improve performance of locally produced corrosion resistant stainless steel in supporting the long-term strategic competitiveness and survival of the South African catalytic converter industry:

- Designers of converters and silencers must attempt to standardise the material in accordance with the current high runners of stainless steel products produced by Columbus Stainless Steel.
- The converter industry must insist on timeous orders from international customers to allow timeous sourcing of stainless steel components from the local market.
- Press shops should manufacture tooling that allows flexibility in the form in which stainless steel is received and processed.
- The South African government should regulate the pricing strategies currently employed by the new shareholders of Columbus Stainless Steel in the selling of stainless steel to the local market.
- The South African government should offer additional protection to the catalytic converter industry via the MIDP programme, in view of the monopoly held by Columbus Stainless Steel.
- The South African government should investigate policy changes with regard to the locally mined raw material used in the production of
stainless steel marketed at international rates by Columbus Stainless Steel.

- The South African government should re-evaluate both the MIDP programme and the conditions related to local content if the catalytic converter industry is to remain competitive on the international market while being forced to purchase products manufactured by Columbus Stainless Steel.

- Columbus Stainless Steel should offer preferential rates for the sale of stainless steel to the local catalytic converter industry to allow the long-term strategic competitiveness and survival of this industry.

- Columbus Stainless Steel should improve the overall image of their supply performance and their desire to serve the local market.

- Columbus Stainless Steel should investigate methods of manufacturing and selling smaller order quantities to the local market. This will reduce the holding costs and lead-times currently experienced by the vendors in the stainless steel supply chain.

7.5 LIMITATIONS OF RESEARCH

The study, in examining the performance of a South African steel manufacturer in localising the demand for corrosion resistant steels within the Eastern Cape catalytic converter industry has the following limitations:
• The South African catalytic converter industry is limited to the support it receives from the international market and therefore its demand for stainless steel.
• Exchange rate fluctuations make it difficult to predict what the future holds for the catalytic converter industry in South Africa and therefore its demand for stainless steel.
• Specific and general economics such as gold, PGM and oil prices effecting the viability of producing converters in South Africa and therefore the demand on stainless steel.
• A decision made by government regarding the MIDP programme could dramatically change the findings of the project.
• The worldwide demand for motor vehicle.
• Legislation regarding the use of catalytic converts in countries such as South Africa and Australia.
• Politically and labour instability in South Africa could affect the future investment in the catalytic converter industry and therefore the demand for stainless steel.
• The introduction of new technology in vehicles that require no silencer or converter (eg. Electrically powered engines) would also decrease the demand on stainless steel.
7.6 CONCLUDING REMARKS

The Eastern Cape catalytic converter industry has shown tremendous growth in the past few years and requires large quantities of stainless steel to satisfy their customer orders. The demand for flat stainless steel product is there, but Columbus Stainless Steel has more interest in exporting their product at international rates than in offering the local market a competitive price.

With the decline in the incentives offered by the MIDP programme, local industry would be purchasing raw material from the best performing supplier, which could be of either local or international origin. Once the MIDP incentives become negligible, the possibility of having to import stainless steel flat product becomes a reality if Columbus Stainless Steel or the South African government does not protect the local catalytic converter industry.
REFERENCES


