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Business environmental factors affecting South Africa's supply chains and economic growth and development

Abstract

South Africa's logistics performance is deteriorating which influences the global competitiveness of the country's products. Supply chains in the country operate in a business environment that is not totally conducive for business. The purpose of this study is to identify and obtain insight into the main business environmental risk factors. Supply chain management will only be able to mitigate risks and develop strategies to neutralize constraints if they have knowledge of the risks and constraints. The study is conducted in the logistics industry by means of a sequential mixed method study, consisting of a survey to identify the most important risk factors and a qualitative study in the form of a focus group discussion to obtain richer data and insight into the problem areas. The study found that increasing transportation costs, the quality and service of infrastructure, lack of skilled and educated human resources, and labor relations pose the biggest risks for supply chains and constrain their competitiveness. The shortcomings in infrastructure and services are not within the control of supply chains and possible delays of deliveries should be taken into account with scheduling. An increase in transportation costs and a lack of quality human resources can be solved by taking a long term approach, such as investing in developing human resources and offering a working environment and culture to enhance their productivity and loyalty instead of trying to retain them with higher salaries or appoint more workers. Transportation costs can be limited by better management of routes and full loads, even if it means partnerships with competing logistics providers. To prevent labor unrest, supply chains should invest in the social well-being of the labor force.

Keywords: business environmental factors, supply chains, supply chain management, supply chain risks, competitiveness, transport, logistics service providers, cargo owners, South Africa.

JEL Classification: M20.

Introduction

South Africa's logistics performance index (LPI) has decreased to 34th out of 160 countries from 23rd out of 155 countries two years ago. There is a critical need for the improvement of South Africa's freight transportation system, based on the vulnerability of the country's logistics performance and competitiveness, particularly to transport costs (Simpson and Havenga, 2011).

The economic growth and development in a country depends on the export of its goods, which depends on how competitive those goods are. The competitiveness of the goods depends on the cost and customer service of supply chains and the logistics activities within them. The effectiveness and efficiency of the supply chains depend on internal factors such as progressiveness, management skills, corporate culture, inter-firm relations, collaboration and more. However, the effectiveness and efficiency of businesses and supply chains also depends on business environmental factors such as the provision of infrastructure, operational management of the infrastructure, the availability of human resources and a regulatory framework conducive for business and trade. Risks and constraints in the business environment negatively impact business, supply chains and economic growth and development of the country.

As with any risks, in order for them to be managed, they must be clearly identified and their importance understood by all involved. This research seeks to identify key risk factors and constraints in the business environment that impact on the competitiveness of supply chains and the economic growth and development in South Africa. It is imperative, through a formalized approach, to identify current potential supply chain risks and to respond rapidly to relevant opportunities as these may influence supply chain success, the achievement of business objectives, and economic growth and development (Bredell and Walters, 2007). The research study was conducted due to a need expressed by the SASC (South African Shippers Council) to solicit the opinions of industry players, particularly service providers and cargo owners, on certain risks and constraints experienced by their members, by means of a quantitative study (survey). This was followed by a qualitative focus group discussion to obtain richer data and then appropriate industry related literature was searched and integrated in the study for further insight into the risks.

The need to identify, understand and manage these impacts and risks is increasing exponentially with the pressure of global competition. In markets and economies internationally, apart from the challenges of the economic recession of recent years, there is a growing global trade and competition, development of new markets and sources of materials, changes in relative costs of services and materials, increasing

costs and customer demands, general need for quicker response times, ongoing development of communication and information technology, and an increasing focus on the environment and sustainability overall (Viljoen, 2011). The technological revolution accelerated globalization and created a dynamically changing world that is becoming increasingly challenging, competitive, complex and customized (Supplychainforesight, 2013). The advent of globalization, and the increasing complexities together with the overall development of the world economy, are also increasing the number of issues and the risk of supply chain disruptions as supply chains get longer, more complex and involve more partners (Hailey and Jonasson, 2013).

Not only do the business environmental risks impact on supply chains in the country but also on potential future economic growth opportunities. Potential international investors look at the risks in a country before they expand their supply chains or invest in emerging markets. Burnson (2014) warns that 'differentiating factors between emerging nations can be the reliability of the infrastructure, safety and political stability, which can result in unpredictable delays and factory shutdowns'.

1. Logistics, supply chains and economic growth and development

1.1. Logistics and supply chain management.

Logistics is concerned with the movement of goods, both incoming goods (inbound) and the distribution of goods to the next member of the supply chain and to the end customer (outbound). 'Logistics management therefore deals with the handling, movement and storage activities within the supply chain – beginning with suppliers and ending with the customer' (Burt, Petcavage and Pinkerton, 2010). As logistics plays a crucial role in ensuring that customers are served with the best possible service at the lowest possible cost, managing logistics activities for maximum efficiency and effectiveness is critical. Supply chain management, on the other hand, entails the planning and management of all activities involved in sourcing and procurement, conversion and all logistics management activities. It also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers and customers (Pienaar and Vogt, 2012). It is clear that logistics is an important part of the supply chain and is often used as a synonym – 'supply chains consist of logistics systems of networks' (Gattorna, 2010). Inefficiencies in one part of the supply chain will have a negative impact on the performance of the supply chain as a whole. All or some of the business partners in a supply chain, particularly logistics service providers,

will encounter some or all of the risks or conditions that exist in the South African business environment, which will have a negative impact on the whole supply chain.

1.2. Economic development, logistics and supply chain management. Logistics connectivity affects the competitiveness of macro-level and global logistics systems (Viljoen, 2011). Logistics costs form 12.5 % of South Africa's GDP and amounted to R423 billion in 2013 (State of Logistics Survey, 2013). As a significant element of the GDP, logistics also affects the rate of inflation, interest rates, productivity, energy costs and availability, and other aspects of the economy (Viljoen, 2011).

The performance and growth of the South African logistics industry are both inputs to and outflows from the performance and growth of the South African economy – especially in the primary and secondary sectors. The exchange rate, inflation rate and interest rate directly impact the cost performance of the logistics industry. Other macroeconomic issues such as the structure of the South African economy, balance of payments, budget deficits and human resources problems affect the economy as a whole, which influence the demand for logistics services. Simultaneously, the performance of the logistics industry – specifically the cost of logistics – has a bearing on the global competitiveness of South African industries (State of Logistics Survey, 2013).

South Africa's economy was ranked 53rd of 148 countries by the World Economic Forum (2014). South Africa thus has a modern economy and a well-developed logistics infrastructure and system. However, shortcomings and risks are noticeable and becoming more evident. As mentioned previously, South Africa's Logistics Performance Index (LPI) has decreased to 34th out of 160 countries from 23rd out of 155 countries two years ago. Of the six factors considered by the World Bank for the LPI, *customs* ranked 42nd compared to 26th in 2012; *tracking and tracing* ranked 41st compared to 16th in 2012; *infrastructure* ranked 38th compared to 19th in 2012. '...the indicators are all going the wrong direction and this should be a matter of concern' (State of Logistics Survey, 2013).

2. Problem statement and purpose of study

As an emerging country South African goods need to compete in international markets. Therefore, South African supply chains need to be competitive, delivering excellent customer value, at the lowest cost. South African supply chains are exposed to numerous business environmental risk factors, constraints, complexities and uncertainties that impact their efficiency and effectiveness and thus, their competitiveness.

Unless identified and proactively and successfully addressed, business environmental risks and constraints will continue to exacerbate the lack of competitiveness of South African supply chains and thus, economic growth. The risk factors and constraints must be researched and thoroughly understood in order to manage them. *The purpose of this research is therefore to identify and investigate risk factors and constraints in the South African business environment that are negatively affecting supply chains and thus constraining the economic growth and development.*

3. Research strategy

3.1. Research approach and design. In this research the *sequential mixed method* was employed. This method is a pragmatic world view, collects diverse types of data and provides an understanding of the research problem. The study begins with a broad survey in order to generalize results to a population and then, in a second phase, focuses on qualitative, open-ended interviews to collect detailed views from participants (Creswell, 2009).

This study consisted of the mentioned quantitative and qualitative study (sequential mixed method) and was further strengthened by an industry related literature study on specific problem areas. The quantitative study was conducted in the form of a survey and the qualitative study in the form of a focus group discussion. The findings of the quantitative study formed the themes for the focus group discussions. A third element in the form of a literature study of mainly industry related reports was added to provide further insight into the environmental risks and barriers experienced in supply chains.

3.1.1. Quantitative study. In order to identify and understand key risk factors and challenges that cargo owners and logistics service providers are facing in the South African business environment, the South African Shippers' Council (SASC) identified a need for formal research into these issues. The SASC members include mostly large cargo owners and logistics service providers in South Africa. (Cargo owners are involved in logistics activities for their own materials (cargo) and the service providers offer logistics services to other organizations). These cargo owners and service providers are confronted daily with hurdles in the business environment that influence their efficiency, effectiveness, customer service and eventually the competitiveness of the whole supply chain. The management of the SASC had various discussions where they identified the risk factors and constraints that they view as straining the competitiveness of South African supply chains.

Nineteen (19) business environmental risk factors were identified and included in the questionnaire. The questionnaire was discussed with the researchers and improved several times before finalization and was tested to ensure the validity of the instrument. The survey was conducted in March 2013 among members of the South African Shippers' Council (SASC), the Chartered Institute of Logistics and Transport in South Africa (CILTSA) and the Transport Forum. The questionnaire was distributed by email to more than a thousand of members of these associations. A follow-up e-mail was sent to increase the low response rate. Only 51 usable responses were received. The resulting low response rate may possibly introduce bias. The completed questionnaires were checked for inconsistencies and omissions and the captured data was processed and analyzed using SPSS.

3.1.2. Qualitative study. A focus group discussion was used to provide richer data on the risk factors highlighted in the questionnaire. The setting in which the focus group discussion occurred provided an encouraging environment for frank, open communication (Salkind, 2012). The focus group discussion was held at the 2013 Annual SAPICS Conference, June 2013. (SAPICS serves as a supply chain network in South Africa). The focus group discussion was included as a workshop in the conference program, parallel with other workshops. The focus group discussion was attended by 23 representatives from different role-players in supply chains in South Africa, plus the 2 researchers.

A presentation was made to the group providing the background to the research, the research problem and the issues identified from the survey. The participants willingly took part in the discussion and the option to leave the meeting at any stage was offered. The group was then asked to choose one of five themes and to divide into five smaller groups to discuss the selected theme. The 19 risk factors identified in the survey were divided into the five themes. The themes were (1) infrastructure issues, (2) operational issues, (3) human resource issues, and (4) regulatory framework and (5) supply chain costs. They were asked not to only discuss the risk factors but also come up with possible solutions to manage them. As nobody volunteered to form a group to discuss 'supply chain costs' the four small groups on the other themes were requested to consider the impact of their selected theme on supply chain costs. After each small group had discussed their selected theme, the group reconvened and each small group reported back, with the aid of flip charts, on their discussions. The researchers made separate notes of the presentations. The notes and the flip charts were used by the

researchers to transcribe the proceedings. This was e-mailed to all the participants to ensure that the ‘proceedings’ are an accurate reflection of the group discussions. Through these discussions, additional information was gathered and insight generated (Salkind, 2012).

The findings of the quantitative study, the qualitative study and appropriate industry literature will be integrated after a brief outline of the survey findings.

3.2. Survey and results. *3.2.1. Profile of respondents.* Of the 51 respondents, 46% were cargo owners, 42% were logistics service providers and 12% were both cargo owners and logistics providers. The respondents were mostly large businesses in terms of annual turnover of logistics activities – 45% of the respondents were from companies generating more than R500 million per annum and 31.5 % from R10 million to R500 million (which are regarded as large businesses in South Africa). These respondents came mainly from the transport and logistics (37%), manufacturing (16%), mining (13%) and agricultural (12%) sectors. The respondents were relatively large movers of materials. About 50% of the respondents moved more than 500 000 tons annually. In terms of containers moved, there is an even spread with 37%

moving more than 1000 containers annually, 29% between 100 and 1000 containers, and 27.5% below 100 containers annually.

With respect to the modes of transport favored by the respondents, 60.8% indicated that they use road transport to move between 40% and 100% of their cargo, followed by maritime transport (43.2%). The Durban harbour is mostly used for exporting, 43.2% of the respondents used this harbor for between 40% and 100% of their total export cargo.

In conclusion, one could say that the respondents are mainly large logistics and mining companies, large movers of cargo that mainly use road transportation. They mostly use Durban harbor for exports.

3.2.2. Supply chain factors. The respondents were asked to indicate to what extent the business environmental risk factors were of concern and problematic for their organization’s supply chain. The following four-point scale was used: to no extent (1), to a small extent (2), to a moderate extent (3), to a large extent (4).

Table 1 reflects a summary of the risk factors of concern for the respondents, from a moderate to a large extent (rated 3 and 4).

Table 1. Supply chain environmental risks of concern

Issues	% Problematic from moderate to large extent
Infrastructure quality in South Africa	78
Operational issues in South Africa	92
Infrastructure quality in the Southern Africa region	68
Operational issues in the Southern Africa region	66
Human resources problems	80
Shortage of skilled and experienced supply chain staff	68
Increasing transportation costs	95
Road vs rail options	70
Introduction of carbon tax	68
Increasing toll roads and e-tolling	79
Lack of law enforcement	64
Corruption in logistics activities in supply chains in South Africa	50
Corruption in logistics activities in supply chains in the Southern Africa region	55
Lack of regional integration and harmonisation	71
Cross-border inefficiency	76
Private sector engagement with government	72
Customs/SARS inefficiencies	50
Labor relations in industry	89
BEEE and transportation charter	61

Source: compiled by researchers from survey results.

From Table 1 the major issues of concern become clear. The issues indicated as problems from moderate to high extent (rated above 80%) include:

- ◆ Operational inefficiencies in South Africa, 92% (55% indicated a problem to a large extent).

- ◆ Human resources problems, 80% (47% indicated a problem to a large extent).
- ◆ Increasing transportation costs, 95% (73% indicated a problem to a large extent).
- ◆ Labor relations in industry, 89% (77% indicated a problem to a large extent).

Problems identified by between 70% and 80% of the respondents are: infrastructure quality in South Africa (78%); road vs rail options (70%); increased toll roads and e-tolling (79%; 57% of respondents indicated it as a problem to a large extent); lack of regional integration and harmonization (71%); cross-border inefficiencies (76%; 46% of respondents indicated it as a problem to a large extent); private sector engagement with government (72%).

The respondents were also asked to *rank* their top five, important risk factors of concern (1 is ranked the most important and 5 the 5th most important problem). The ranking is as indicated in Table 2.

Table 2. Ranking of most important supply chain risks or problems

Importance ranking	Risk factor
1	Infrastructure quality in South Africa (37.3%)
2	Operational inefficiencies in South Africa (35.5%)
3	Increasing transportation costs (27.4%)
4	Labor relations in industry (13%)
5	Shortage of skilled and experienced supply chain staff (8%)

Source: compiled by the researchers from survey results.

It was found that infrastructure quality in South Africa ranked the highest i.e. the number one risk factor by 37.3% of the respondents. The second most important risk ranked was operational inefficiencies (35.3%) and then increasing transportation costs (27.4%). Fourth most important is labor relations and fifth the shortage of skilled and experienced staff.

By reconciling the rating and ranking of the issues of most concern, the following four can be regarded as the top factors that justify further discussion in the paper, and further research:

- ◆ infrastructure;
- ◆ operational inefficiencies;
- ◆ human resources (including labor relations);
- ◆ costs.

Due to a small number of responses and the structure of the questionnaire a limited possibility for inferential statistics existed. The inferential statistics that could be done were on significant differences between cargo owners and logistics service providers, which had shown differences in a limited number of areas, but falls outside the scope of this article.

4. Integration of survey, focus group and literature

In this part of the paper an effort is made to integrate the survey findings, focus group discussion and literature on the different risk factors and themes.

4.1. Infrastructure. ‘The performance of South Africa’s logistics industry is very dependent on its transport infrastructure, logistics service provision, cross-border trade facilitation and telecommunications system. Transport infrastructure, arguably the most important component of these, is a critical ingredient for economic growth, development and wealth creation. Transport infrastructure investments are key determinants of performance in the transport sector’ (State of Logistics Survey, 2013).

In this study the *survey* indicated that 78% of the respondents felt that infrastructure quality in South Africa is an important factor constraining them. 72% saw the lack of private sector engagement with government; 70% the road versus rail options; and 68% infrastructure in Southern Africa, as constraints.

It was the view of the *focus group* that in some instances South Africa has a good infrastructure e.g. world class ports and harbours, however the operation thereof is poor. In a sense Transnet Freight Rail (state-owned enterprise providing and managing the national rail network) has a fairly good infrastructure, however it has not been adequately extended and therefore there are many capacity problems. Consequently, road transport has increased (doubled in a few years) with a negative influence on the quality of the roads, which have not been maintained adequately to keep up with the level of usage. The government mostly provide transport infrastructure and the group felt that there is a general lack of accountability within government institutions and inadequate action plans for engagement with the private sector. Government should allow the private sector to participate more in the provision of infrastructure, particularly rail. There is a general misalignment between infrastructure provided and the demand for it. Many organizations have a need for rail transport, particularly for their bulk transport requirements. There is also a misalignment in infrastructure between South Africa and other South African countries. South Africa, in comparison with other African countries has a well-developed infrastructure, but when trade is extended to the neighboring and other African countries infrastructure becomes a problem, to the detriment of trade and economic development of the region.

The government has spent R1 trillion on new infrastructure over the past five years and plans to spend further R847 billion in the next few years. However, an economist, Joffy (2014), points out that the infrastructure investment program is happening too slowly to add to the net investment and to boost economic growth significantly. Much of the investment has been spent on developing power stations which have yet to deliver new power.

Infrastructure planning should take the operational characteristics and needs of logistics systems into account (Viljoen, 2011). Transnet may, by providing additional capacity and improving reliability on the bulk mining and agricultural lines and successfully implementing intermodalism, shift many tonnes from road to rail (State of Logistics survey, 2013).

Since the study has been conducted there are signs that Transnet realized the importance of private sector involvement in the development of additional rail infrastructure. They invited the private sector for discussions on these matters and a good response followed (Ensor, 2014).

4.2. Operational inefficiencies. With the *survey* it was found that 92% of the respondents regard operational inefficiencies in South Africa as a risk factor (55% indicated it to a large extent). They also ranked it as the second most important risk of the top five. On this theme, 71% of the respondents indicated that there is a lack of regional integration; 76% indicated cross-border inefficiencies.

The *focus group* on operational inefficiencies in South Africa was of the opinion that Transnet is partly to blame for operational inefficiencies. They feel that there is a lack of communication between Transnet and its divisions, and this leads to bad planning and inefficiencies. There are problems in cross-border operations particularly with regard to law enforcement and corruption and other operational issues which are 'killing business'. A lot could be done with regard to the standardization of documentation between the countries and upfront communication through an efficient information system about vehicles due to arrive at border posts. This could also lead to less corruption and efficient crossing of the borders. Skills development of border personnel and harmonization of infrastructure between South Africa and its neighboring countries would also lead to more efficient supply chains and economic development in the region. The development of consolidation hubs where advanced planning and better decision-making could be ensured regarding the use of road or rail should be pursued.

Well-connected, effective and efficient ports provide access to the important maritime trade routes which, in turn offer access to the significant global markets (Viljoen & Bartholdi, 2011). In a survey undertaken by the Freight and Trade Weekly (FTW) regarding service levels in the logistics industry, the respondents had to rate the service levels of South African ports, shipping lines, warehousing, transport operators, logistics providers, consolidators and airfreight on a scale of 1 to 10 (1 = poor and 10 = excellent). The service levels were all rated

between 5 and 6.5 except for South African ports, which were rated at 3.94. Also, 54% of the respondents felt that service levels had deteriorated over the past three years (Orlek, 2013).

'Both good service delivery in the logistics environment and good infrastructure are under pressure in the country' (State of Logistics Survey, 2013).

4.3. Human resources. To compete in the global business world South African supply chains require the necessary levels of skilled, experienced and productive supply chain staff. The Supplychain-foresight (2014) indicated that a shortage of skills in South Africa is the 4th highest supply chain constraint. A general shortage of a skilled workforce in South Africa, not only in the logistics and supply chain areas, is hampering economic growth. The World Economic Forum (WEF) (2014) identified an inadequately educated workforce as the most problematic factor for doing business in South Africa. Linked to human resources problems the WEF indicated that the quality of the education system is very poor (ranked 146th of 148 countries), labor market efficiency is poor (116th), hiring and firing practices are extremely rigid (147th), inflexible wage determination (144th) and significant tension in labor-employer relations exist (148th).

The respondents (in the logistics industry) of this study, above 80% considered human resources as a risk area; between 60%-70% experience a shortage of skilled and experienced staff; and when ranking the top five risks, a shortage of skilled and experienced staff ranked fifth. The *focus group* noted a lack of skills, particularly supply chain skills, communication and engineering. There are also major concerns with regard to the need for up-skilling of people through education, encouraging companies to comply with, or adhere to, the transferring of skills, collaboration and exchange programs with international institutions and organizations. Transferring of skills and the mentorship of employees should be ingrained in the fibres of all corporate culture. There should also be a drive to retain employees, who have received education and training and thus been up-skilled during their time with an organization, in the organization and in a particular position for a number of years in order to reap the benefits thereof. Finally, there needs to be ongoing education, training and development of graduates and therefore a culture of continuous up-skilling. The lack of skilled personnel on all levels hampers the performance of supply chains. From an industry survey it appears that tertiary degrees and professional certifications teach students the required 'hard' skills for day-to-day supply chain work, but there is a great gap in terms of 'soft' skills and practical exposure (State of Logistics

Survey, 2013). The previously-mentioned FTW survey regarding service levels in the logistics industry, points to (1) the overall quality of staff which seem to lack training and have no insight into the results of their actions, (2) service levels in the freight industry which appear to be far from satisfactory with the dearth of skilled staff at the root of the problem, and (3) overall knowledge and problem-solving being the greatest problem (Orlek, 2013).

As indicated in this study's findings, *labor relations* ranked the fourth most important risk in supply chains. With regard to labor relations in the industry, it was noted by the focus group that the outsourcing of some services and the use of labor brokers can be problematic and lead to salary issues and strikes. It was felt that labor brokers often involved questionable human resources practices and could lead to unacceptable working conditions; that the actions of the various unions and bargaining councils were questionable; and that working conditions, security and safety and the use of migrant workers as opposed to locals were also becoming major issues, particularly with respect to a perceived lack of loyalty by the migrant workers toward the country.

Brandt (2014) refers to the issue as 'the country's well-chronicled labor tensions' and notes that constraints in labor relations have an extremely negative impact on the country's supply chains and therefore economic growth and development. Bell (2014) ascribes this to a legacy of decades of neglect, mistakes, and insensitivity on behalf of employers, unions and all tiers of government, with the actions of laborers partaking in lengthy strikes leading to them suffering desperate hardship. He also notes that 'this trend is likely to be repeated and exacerbated, with increased mechanization and consequent job losses, unless prompt and sensitive action is taken to improve the lives of the labor force, the future will remain troubled'. However, at the same time the challenge is to manage labor costs and improve skills (Storey & Urquhart, 2014). Labor unrest remains a concern across most industry sectors (Supply-chainforesight, 2014). Organizations are thus increasingly seeking to protect their supply chains against the risk of interruptions to their businesses and supply chains through strikes and riots (Odendaal, 2013). Reimers (2014) notes that addressing problematic labor relations, is the first step for an organization in mitigating their risk profile and has a significant impact on supply chain resilience, and business profitability and reputation. The bottom line is that together with infrastructure and operational constraints, and rising costs, labor disputes remain the biggest inhibitors of Africa's

growth. Unrest and shortages of labor have to be addressed (Venter, 2013).

4.4. Costs. The performance of the logistics industry, specifically the cost of logistics, has a bearing on the global competitiveness of South African industries. Total logistics costs amounted to R393 billion in 2012 (12.5% of GDP), an estimated R423 billion in 2013, and R470 billion is estimated for 2014 (State of Logistics Survey, 2013). The Supplychainforesight (2014) ranked the top supply chain constraints as the cost of transport.

In the *survey* the single highest scoring item of the nineteen risk factors was 'increasing transportation costs' with a score of 95%. Relating to increasing transportation costs is the introduction of the expensive e-toll in the Gauteng Province, the economic hub of South Africa. Seventy-nine per cent (79%) of the respondents indicated it as a problem. If one considers that the survey was done in 2013, before the e-tolling was put into operation, one can imagine how respondents will react to rating this problem after its introduction, with toll fees much higher than were generally anticipated. The *focus group* indicated that all the other problems experienced in supply chains have cost implications, such as the lack of quality or adequate infrastructure, human resources capacity, labor relations and operational inefficiencies.

The road freight industry in South Africa has also registered concern as they see costs escalate in the form of tolls, fuel and taxes, as well as fees across the borders, and carbon tax set to be introduced in the near future (Venter, 2013b; Ittman, 2011).

As indicated above, the largest component of total logistics costs in South Africa is transportation costs. The primary cost drivers for transportation costs are *fuel* and *wages*. The soaring price of fuel and a trend in the growth of management and administration costs, due to more employees (excluding vehicle drivers) in the transport sector and a growth in the wages of these individuals that is above the inflation rate are the main contributors to increased transportation costs. Shifting from road to rail will have a positive effect on fuel consumption. Savings in emissions and accidents, congestion and better road safety will be additional benefits when a shift from road to rail takes place on a large scale (State of Logistics Survey, 2013).

4.5. Legal framework. While the news media report multiple cases of a lack of law enforcement, fraud and corruption, only 64% of respondents to the *survey*, felt that lack of law enforcement in logistics was a concern for their organization's supply chain, while, 56% felt that corruption in

logistics activities in the *Southern Africa region* and 49% in *South Africa*, was an issue.

Although not one of the top risk areas indicated by the survey, it was decided by the initiators of the study and researchers to further investigate this area of concern, because The World Economic Forum (2014) indicated that 'security continues to be a major concern for doing business' in South Africa. South Africa ranked 109th out of 148 countries in this area.

In the *focus group*, it was agreed that often legislation was changed too quickly without an understanding of the needs and issues of the affected groups or the necessary inputs from them. The affected stakeholders are then not given adequate time to adjust to the requirements of the changes in legislation. Members of industry in the focus groups also discussed the fact that it was time for law enforcement to 'get serious about corruption'. With regards to fraud and corruption, it was agreed that there are adequate laws and regulations in the country, however the enforcement thereof is problematic which leads to a large scale culture of corruption in the country. Sanctions and enforcement against fraud and corruption need to become part of the regulations. The justice system is also not conducive to law enforcement and the prosecuting authorities often lack the necessary skills, while judgements passed down are often not adequately punitive. General sentiment is that improvements in law enforcement are particularly needed throughout Africa, as corruption constantly constrains growth of the continent. Education needs to be deployed to create awareness of the importance of ethics and the consequences of unethical behavior.

Industry literature notes that bribery and corruption are definite challenges. For example, officials find creative ways to 'dish out' fines in order to obtain a bribe. However, increasingly logistics providers are standing by policies of refusing to submit to bribery (Mackenzie, 2014a). Another area of major concern is with trade between South Africa and its neighboring counties – 'bribery at border posts is a way of life...there are always people in the supply chain who will encourage expeditious handling of shipments or trucks for a favor' to overcome the high level of congestion and slow release of cargo over African borders (Mackenzie, 2014b and c). Although the police can continue to tighten security, what is really needed is to improve the efficiencies and governance systems of these crucial trade corridors (Mackenzie, 2014d). However, the ability, for example, to search every container and every other movement of goods across a border and still

allow trade to be cost-effective is challenging (Pienaar and Vogt, 2009). Such enforcement has the potential to create bottlenecks in the supply chain.

Summary and conclusion

Due to the nature of supply chains, business environmental risks and constraints are widely encountered through the many stages to deliver the final product or service to the satisfaction of the final consumer. In this paper research was done to investigate the business environmental risks that supply chains operating or partly operating in South Africa face. Environmental risks are not controllable by individual businesses and supply chains. However, the better they understand the risks the better they can manage their businesses and supply chain to reduce the impact of them. Some of the risk factors can be laid at the door of the government and should be addressed by government, preferably in partnership with the private sector. Areas that need the government's attention urgently are rail infrastructure, labor laws and education. Labor laws (hiring and firing) are too strict and this gives rise to the extensive use of labor brokers, which is unpopular on a wide front, particularly labor unions and workers. This gives rise to labor unrest.

Infrastructure which is a major constraint for cargo owners and logistics service providers is to some degree addressed by the government, but not at the pace that is needed to make the country competitive. Positive signs of private sector involvement in infrastructure development are evident in the media lately. A move from road to rail of heavy cargo is thus a possibility in the foreseeable future, which will alleviate many of the risks of heavy traffic, toll fees, fines, accidents, hijackings and insurance costs. Infrastructure development of neighboring countries should be high on the agenda of the SADC (Southern Africa Development Community). A properly developed railway network in the region can facilitate trade between the countries and decrease bottlenecks and corruption by officials at the borders. Documentation could be standardized and integrated information systems of cargo about to move through the border posts will also facilitate border operations. Although South African port infrastructure is modern, the operational efficiency is criticized on all fronts, which necessitates the attention of Transnet. Businesses and supply chains should take possible delays at border posts and at ports into account with the planned delivery dates.

A skilled and efficient workforce remains a large problem in South Africa. Supply chains operating in South Africa must therefore invest in the education,

development and upskilling of their workforce and make an effort to retain them. The transferring of skills and mentorship should be part of the corporate culture. Work ethics should form part of the transferring of skills. The labor relations factor is a serious risk that has the potential to kill business and the economy. Supply chain operators can consider mechanization in order to alleviate this risk, but there will always be a human factor in any operation. Investment in the social well-being of the labor force is unavoidable.

Rising supply chain costs, particularly transportation costs is a major problem impacting the competitiveness of supply chains. The exorbitant increase in transportation costs is mainly caused by the cost of fuel, a larger workforce and increasing salaries. Supply chain players can only mitigate the cost of fuel by better management, such as the planning of loads and routes and forming partnerships with other transporters to assure full forward and return loads. The increase in the workforce in the transport sector and higher salaries can be alleviated by the development of employees in order to improve their productivity and to retain skilled staff through a positive corporate culture instead of higher salaries.

Although high levels of crime and a lack of law enforcement are experienced by citizens and businesses every day in South Africa, it was not regarded as a serious risk by the logistics service providers and cargo owners. In a regional context corruption at border posts seems to be problematic. The only way to stamp out this problem is a collective decision by the industry not to succumb to bribes, even if it means a delay of many days at border posts. Law enforcement is a practical way that ensures compliance yet does not inhibit the flow of trade thus plays an important role in logistics efficiency.

In conclusion, it seems that rail infrastructure, rising costs and human resources, particularly lack of appropriate skills and labor relations, are the most serious business environmental risks for supply chain competitiveness and economic growth of the country and region. Individual businesses and supply chains must manage their transport costs better by better route planning, full loads and partnerships with other logistics companies. Businesses and supply chains must invest in human resource development, mentorship and motivation through corporate culture (loyalty and pleasant working environment) instead of large increases in salaries of administrative and managing staff.

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