PUBLIC SECTOR SUPPLY CHAIN RISK FACTORS IN GAUTENG PROVINCIAL TREASURY

by

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MINOR DISSERTATION

Submitted in partial fulfilment of the requirements for the degree

MAGISTER COMMERCII

in

BUSINESS MANAGEMENT

in the

FACULTY OF MANAGEMENT

at the

UNIVERSITY OF JOHANNESBURG

Supervisor: MR L. JACOBS

OCTOBER 2019

ACKNOWLEDGEMENTS

The opportunity to study is a once in a lifetime opportunity, and I count myself fortunate not only to have had the opportunity but also to have a firm support structure. My parents Monono and Margaret Moema; I thank them for not only supporting my dreams but also providing strength when I needed it. Sikhumbuzo Mahlangu, you have been there for me through the worst of times during my MCOM studies. Sleepless nights and working weekends, you always encouraged a great hope that I will emerge victoriously. I thank my brothers, Tumelo Moema and James Meko; you always provided me support at times I could not spread myself thin; you were there. In the end, I completed because of the strength in our unity not only because of my abilities. I profusely thank my supervisors Mr Lunga Jacobs and Prof. Elana Swanepoel without whose guidance and support I would not have completed my study.

ABSTRACT

The study aimed to examine four main Supply Chain Management Risk Factors in Gauteng Provincial Treasury (GPT). The study provided a literature review of the risk factors in the public sector as well as provided validation of perceptions of supply chain management Officials in GPT regarding risk factors. Measuring the perceptions could enable better planning as the current remedial responses by the GPT to the risk factors have not been effective. The factors include the risk of skills shortage, a decentralised procurement system, limitations in the authority of the Auditor General and corruption and fraud in Supply Chain Management (SCM).

A quantitative research method was used to effectively develop a scale for determining where to focus efforts on improving SCM implementation further. The quantitative data was collected using a survey strategy which was an anonymous questionnaire distributed to SCM officials in GPT. The results from the questionnaires confirmed that the department is susceptible to SCM risk factors, especially to fraud and corruption. The results from the questionnaires will assist the public sector as a whole to plan its SCM processes with a better focus on risks rather than the occurrence of challenges in supply chains. The study could assist policymakers as well as public officials in Gauteng Provincial Government to mitigate the risk in supply chain management before the risk occurs in public sector organisations.

Key words: Supply Chain Management, Supply Chain Management Risk Factors, public sector, procurement, strategic supply chain management, service delivery.

DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the owner of the copyright thereof (unless to the extent explicitly otherwise stated) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Tebogo Chantal Moema October 2019

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List of Acronyms and Abbreviations

Acronym	Description
AG	Auditor-General
AGSA	Office of the Auditor-General South Africa
BSDS	Brief Social Desirability Scale
CD	Chief Directorate
CDS	Capacity Development Strategy
CFO	Office of Chief Financial Officer
CIGFARO	Joint Matriculation Board, Chartered
CIPS	Chartered Institute of Procurement and Supply
CPAR	Contractor Performance Assessment Reporting
CSD	Central Supplier Database
DG	Director-General
FMS	Financial Management Services
GAS	Gauteng Audit Services
GDP	Gross Domestic Product
GP	Gauteng Province
GPG	Gauteng Provincial Government
GPT	Gauteng Provincial Treasury
HOD	Head of Department
IA	Internal Audit
ICT	Information and Communication Technology
IMFO	Institute of Government Finance, Audit and Risk Officers
PS	Public Sector
PT	Provincial Treasury
SC	Supply Chain
SCM	Supply Chain Management
SCR	Supply Chain Risk
SCRM	Supply Chain Risk Management
Statkon	Statistical Consultation Services
OCPO	Office of the Chief Procurement Officer
RDP	Reconstruction and Development Programme
SAICA	South African Institute of Accountants
SALGA	South African Local Government Association
SDS	Social Desirability Scale
SFRM	Sustainable Fiscal Resource Management
NSD III	National Skills Development Strategy

NSG	National School of Government
NT	National Treasury
NPM	New Public Management
PSCAM	Provincial Supply Chain Asset Management

CHAPTER 1: BACKGROUND

1.1 Introduction

The purpose of Supply Chain Management (SCM) is to enable organisations to action goals and objectives due to the direct relationship between the performance of the supply chain and customer satisfaction indicated by Razak, Rowling, White and Mason-Jones (2016: 44). Effective SCM is embedded in six pillars of SCM described by Zijm, Klumpp, Regattieri and Heragu (2019: 33). Zijm et al. (2019: 33) stated that the pillars are attributed to; efficient, customer oriented, speed, effectiveness, environmental sustainability and creating safe and socially acceptable working conditions the organisation is able to operate optimally. Without an efficient and economical plan, the process may be counterproductive to reaching the goal of the organisation by negatively impacting the performance of the company as stated by Ho, Zheng, Yildiz and Talluri (2015: 5031). The performance of SCM is especially relevant in the public sector, as the threat posed by limited fiscal resources requires specialised precautions against public sector supply chain risks. According to Razak et al. (2016: 44) procurement in the public sector is not only a balancing act of cost efficiency and quality services but includes a highly regulated and restricted environment. Therefore, it is necessary to identify and mitigate the risks associated with public sector procurement; risks that affect cost efficiency and the quality of services.

Razak et al. (2016: 44) stated that SCM is an important function in organisations in both the public and private sectors as SCM is the point of delivering departmental plans. Furthermore, Razak et al. (2016: 44) indicated that SCM has become increasingly important to develop effective and strategic procurement for the success of the public sector. To ensure accountability, SCM in the South African Public Sector is governed by an extensive legislative framework and policies that aim to increase efficiency, effectiveness and economy. Accountability in SCM is achieved through the elimination as well as mitigation of risks associated with the implementation of SCM.

1.2 Supply Chain Management legislative framework

The Constitution of the Republic of South Africa (1996: 112) sets a basis in South Africa for public sector procurement. The Constitution of the Republic of South African (1996: 112) stated that in the event that “contracts for goods or services, must be done in accordance with a system which is fair, equitable, transparent, competitive and cost-effective”. The Constitution

paves the way for the Public Finance Management Act (1999) in which the National Treasury of South Africa is mandated and is the guardian of all public finance-related matters.

The Public Finance Management Act (1999: 13) focuses on the priority that should be placed on value for money in utilising the fiscus for service delivery in SCM processes in the public sector. The purpose of the Public Finance Management Act (1999: 1) is to regulate financial management in the different levels of government to ensure that as well as efficient and effective management of revenue, expenditure, assets and liabilities. The Constitution of the Republic of South Africa and the Public Finance Management Act are both legislation in public sector financial management with the purpose of promoting caution in public sector spending. To provide guidance for the execution of the Constitution and the Public Finance Management Act, the Treasury Regulations are applied.

The Treasury Regulations 16A provide guidelines that are necessary to apply effective SCM in the public sector. Without the Treasury Regulations, the application of the Constitution and Public Finance Management Act would not be consistent even though the legislative framework is cumbersome. Supporting SCM implementation in the public sector is preferential legislation such as the Preferential Procurement Policy Framework Act (2000) as well as Broad-Based Black Economic Empowerment (2003). The aim of the two legislations is to economically empower black people in the economy through preferential procurement practices due to Black South Africans being previously disempowered. Fourie (2015: 39) stated that South Africa has a "history of unfair practices, where certain groups were marginalised and prevented from assessing government contracts".

In addition to the rigorous SCM legislative framework, the National Treasury (2016a: 1) established the Office of the Chief Procurement Officer (OCPO) in 2013. According to National Treasury (2016a: 1), the strategic objectives of the OCPO are based on the promotion of five pillars, namely: value for money, open and effective competition, ethics and fair dealing, accountability and reporting; and equity. The Office aims to reinforce efforts placed in the SCM legislative framework during non-compliance by SCM officials in all public sector organisations (National Treasury; 2016a: 1).

1.2.1 Public sector Supply Chain Management Challenges

Despite the methodical SCM framework legislated to ensure compliance and value for money, public sector procurement encounters challenges that delay service delivery, which aggravates the occurrence of SCM risk factors. According to the South African Local

Government Association (SALGA) (2015: 30), one such example is the allocation of houses through the Reconstruction and Development Project (RDP), in which houses allocated were not being received by the rightful owners. According to Corruption Watch (2017: 19), 52 percent of all complaints relating to the state's allocation of housing come from Gauteng, where land is scarce, and land demand the highest. Corruption Watch (2017: 19) confirmed that the majority of these complaints involved the rigging of tendering system and collusion between some construction firms, contractors and administrators so as to inflate costs and to aid corrupt state employees to embezzle money. This renders housing development slower, as plundered budgets are expended on fewer units, and undermines the fair value of the provided housing, through artificial cost inflations.

According to Ernst and Young (2015: 4) a strengthened public sector exhibits fiscal fitness and focuses on adding value. A strengthened public sector is effective and efficient. The implementation of these values needs to be balanced with the requirements of transparency and accountability. When aligned, this offers a governance framework that encourages decisions that aim to achieve optimal public value. Therefore, the strategic approach to procurement provides mechanisms that will be required to curb inefficiencies in the procurement process and therefore expand the impact of service delivery.

In his National Budget speech in 2013 (2013: 28) former Minister of Finance Pravin Gordhan stated that there are inefficiencies in public sector procurement processes that are causing wastage. These inefficiencies include the decentralised procurement centres in the public sector; which has led to business over pricing services to the public sector (National Treasury; 2013: 28). The extent of the challenge is also mirrored by the Former Director General (DG) of the National Treasury, Lungisa Fuzile, in the 2015 Public Sector Supply Chain Management Review (National Treasury; 2013).

In the 2015 Public Sector Supply Chain Management Review, National Treasury (2015: 1) stated that procurement in the public sector is being misinterpreted as well as undervalued by both public officials and business. The effect of inefficiencies in SCM leads to a loss in value for money and poor or no service delivery. Ambe (2016: 278) stated that a reliable procurement system leads to effective capital spending for the construction of service delivery-based infrastructure. This could lead to public sector increased sustainability, by improving overall performance through the increase of quality service delivery.

Poor service delivery at service points has resulted in service delivery protests, of which many have turned violent. According to SALGA (2015: 11), a consequence of protest actions comprises damage to infrastructure and public amenities; which is also detrimental to service

delivery. In 2014/15, the then Minister of Police, Nkhosinathi Nhleko, reported in the Crime Situation in South Africa Report (2015: 1) that 14 740 incidents occurred, of which 12 451 were peaceful, and 2 289 had turned violent. In 2015/16, the Crime Situation in South Africa Report (2016: 1) stated that there had been a total of 14 693 service-delivery protests with 11 151 peaceful and 3 542 resulting in unrest. The 14 693 overall number of protests reported by the then Minister of Police for 2014/15 denotes slight improvement between the two financial years, with 47 fewer protests being recorded. However, the number of violent service-delivery protests increased by 1 253 incidents. The occurrence of these protests does show that service delivery is a challenge for public sector organisations, with quality service delivery being the goal; this means that the objectives in respective organisations are not being attained.

The Gauteng Provincial Treasury (2014: 14) in the Strategic Management Framework lists the challenges facing the South African public sector procurement as the following:

- deficiency of adequately knowledgeable, expertise and capability;
- lack of compliance with comprehensive SCM legislative framework;
- the deficient organisation and budgeting methods;
- poor value for money;
- inadequately enforced accountability;
- the occurrence of illicit activities such as fraud and corruption;
- insufficient monitoring and evaluation of procurement results;
- lack of ethics;
- overly decentralised procurement system;
- Limited or no post-contract management and supplier relationship management.

The above is similar to Ambe and Badenhorst-Weiss's article (2012: 249), which identified challenges in South African Public sector SCM:

- Lack of adequate knowledge, skills and capacity;
- non-compliance to SCM legislative frameworks;
- Insufficient demand planning for the budget;
- Lack of accountability, resulting in fraud and corruption and a lack of monitoring and evaluation of SCM;
- Lack of ethical behaviour;
- Decentralised procurement system; and
- Ineffectiveness of preferential procurement policies and legislation.

According to Ambe (2016: 277), Public Procurement in South Africa operates as a strategic tool with political intentions namely socio-economic development and transformation. Despite the fact that there is an extensive legislative framework, officials are sometimes guided by the political intentions of political office bearers, which increase the chances of the system being abused or bypassed.

As indicated by the Director-General of the National Treasury in the 2015 Public Sector Supply Chain Management Review (2015: 1), the perceptions of SCM in the public sector lack strategic intent. Therefore, in order to improve Public sector SCM, the procurement process should be seen as a commercial decision making rather than transactional buying (Gauteng Provincial Treasury; 2014:9). The transactional approach consists of traditional characteristics in comparison to commercial decision making that holds a strategic approach in the SCM value chain.

The traditional approach focuses operations on the bidding process, negotiating, awarding of a contract, and managing the contract and relationship, which are predominantly administrative rather than strategic. The traditional approach only requires practitioners to process transactions without consideration of the impact of the activity and value for money thereof. According to Akintan and Morledge (2013: 4), the traditional procurement strategies inhibit practices such as sharing of “valuable ideas; restricts risk sharing possibilities; hampers effective project coordination and creates rivalry”. Akintan and Morledge (2013: 4) add that the only way to mitigate risks associated with the challenges is through “collaborative involvement”. This is achieved through the elimination of waste, delays and extra cost; which can be seen as a strategic approach to procurement.

The transformational strategic approach requires that transactions are geared with the aim of creating sustained value-add to the service-delivery goals. Unlike the traditional approach, the strategic approach focuses equally on operations of the various processes. Value is realised in the initiation of the project; therefore, the strategic approach plans the project. Gathering information, analysing spending and researching the market are strategic processes that assist in predicting the future, to avoid disruptions through sufficient planning. The administration does not require in-depth cognitive ability, thereby requiring less resourcing as opposed to strategic functions. Without strategic intent, procurement processes become administrative tasks with limited value add.

1.3 SCM Risk Factors in the South African Public Sector

Risk factors in SCM are not the same for public and private sectors. However, from literature presented by Chopra and Sodhi (2004: 54) and Kaye (2014: 17), there are similarities as some private sector risk factors are relevant to the public sector environment. Four main risk factors are presented regarding the sound implementation of SCM in the South African public sector.

1.3.1 Public sector Supply Chain Skills Shortage

According to Heyns and Luke (2012: 110), the Department of Labour identified 11 critical industries that are experiencing skills shortages in South Africa. They include engineering and built environment professions, health professions, finance professions, law professions, city planners, information and communications technology (ICT) professions, natural science professions, management professions, education professions, transport professions and artisans. They emphasised that these skills are critical to the successful implementation of SCM, especially for engineering, finance, law, ICT, management, transport and artisans. Furthermore, Heyns and Luke (2012: 113) stated that there is a shortage of SCM skills in the country. The National Treasury (2016c: 4) emphasised that "SCM employees have been in government for many years without appropriate SCM related academic qualification and relevant training". The study conducted by the National Treasury (2016c: 4) stated that the government is the largest capital spender; therefore, requiring appropriate skilling of public sector SCM employees. However, the National Skills Development Strategy (NSD III) (2011: 22), highlights the lack of skills in the public sector as a disabling factor to achieving the goals of a developmental state.

1.3.2 Decentralised Supply Chain Management

According to Ambe (2016: 280), the introduction of the Public Finance Management Act (1999) was the beginning of a decentralised procurement system which is managed by accounting officers at localised service-delivery points. This was developed with the intention of ratifying service delivery at each point of delivery. Ambe (2016: 280) stated that currently there are 36 different public sector SCM systems that are poorly integrated and are manual. In the current form, information, as well as processes, are fragmented; leaving enough room for inefficiencies.

Decentralisation using technology to automate the process of procurement can have efficiency implications. However, in the instance of the South African public sector, the technological foundation has not been implemented uniformly, not according to localised needs. Mitchell (2000: 21) stated that e-procurement is a process of electronically purchasing goods and services required for an organisation's operation. E-procurement can be used as a tool to improve public sector SCM. According to Croom and Brandon-Jones (2005: 369), digital integration may improve the following areas in a public sector organisation: reduced costs, quality customer service, and consistency in process capability; and increased control of material flows along the supply chain. In addition to the advantages of an e-procurement system, Mitchell (2000: 21) stated that an electronic system provides a real-life platform for conducting business.

It is important to note the motivations for each system especially for the public sector as public funds are used to fund political mandates as well as achieve service delivery. Table 1.1 shows the various arguments surrounding decentralisation as well as centralisation in SCM.

Table 1.1: Decentralisation versus centralisation in SCM

Decentralisation	Centralisation
Easier to customise especially for bulk purchasing.	Reduces operational costs.
Promotes competition for state contracts.	Opportunities for collaboration in relation to tender and specification development.
Prevents corruption and promotes accountability.	Reduces administrative costs.
Facilitates certain logistical advantages in terms of inventory management and distribution.	Lowers the cost of personnel.
	Monitoring and reporting of operations less burdensome.
	Promotes transparency and effective management controls.
	Better suited for policy procurement addressing social and environmental objectives.

Source: Brooks (2016: 44-47)

The South African public sector SCM leans towards a decentralised system by legislation; however, recent developments show that there are elements of centralisation as seen with the Central Supplier Database (CSD) as established by the National Treasury (NT) in 2013. Table 1.1 shows that centralisation reduces operational costs; however, creates prospects for co-operation in relation to tender and specification development increase. Centralisation also brings reduced administrative costs and lower cost of personnel. In addition, requirements for

monitoring and reporting of operations are less cumbersome. A centralised system stimulates transparency and effective management controls, and it is suitable for policy procurement aimed at social and environmental goals.

On the other hand, a decentralised system increases the cost of personnel and administrative cost, increases administrative cost, increases the need for monitoring and reporting of operations, has less transparency and effective management controls. Essentially Brooks (2016: 44-47) refers to a purely decentralised system as not suited to the public sector due to the cost, administration and low levels of transparency.

The CSD was established because there is currently no single consolidated comprehensive supplier database for all three spheres of government (National Treasury; 2018b: 1). This, according to the National Treasury (2018: 1), has resulted in duplication and fragmentation of supplier information. The CSD aims to create a centralised supplier database for all three spheres of government; eradicating duplication and enabling electronic procurement processes.

1.3.3 Limited authority of the Office of the Auditor-General

The Office of the Auditor-General South Africa (AGSA) was established according to Section 188 of the Constitution of the Republic of South Africa Act 108 of 1996 as a Chapter Nine Institution. According to Section 181 of the Constitution of the Republic of South Africa (1996: 96), the institutions aim to strengthen constitutional democracy in the country. The institutions are independent and only accountable directly to the Constitution. The Auditor General must audit and report on the accounts, financial statements and financial management of the South African public sector annually. The Auditor-General's Annual Reports have repeatedly placed SCM as one of the areas of risk in public sector financial management, from 2011/12 to 2015/16 financial years. The Auditor General (2015: 21) explained the meaning of the audit outcome findings in accordance with Section one of the Public Finance Management Act 1 of 1999:

- Unauthorised expenditure that exceeds the budget and was not for the appropriated intention.
- Irregular expenditure which does not comply with the prescribed legislation, and regulations.
- Fruitless and wasteful expenditure that is ineffective or otherwise could have been avoided or is not appropriated.

The above shows how various forms of the mismanagement of public funds can be categorised when the Auditor-General conducts evaluations on a specific department's compliance. In the 2014/15 and 2015/16 Audit Outcomes, the Auditor-General reported an overall increase in incidents of financial misconduct; which is directly linked to procurement. This is shown in Table 1.2 with the percentage change in the amount of irregular, fruitless, wasteful and unauthorised expenditure.

Table 1.2: 2014/15 and 2015/16 Audit Outcomes

R'000	2014/15 Audit Outcome	2015/16 Audit Outcome	% Change
Irregular expenditure	28 628 000	46 360 000	80%
Fruitless and wasteful expenditure	936 000 000	1 370 000 000	46%
Unauthorised expenditure	1 641 000 000	925 000 000	-44%

Source: Consolidated general report on national and provincial audit outcomes for 2014/15 and 2015/16

Irregular expenditure increased by 80% between the two financial years under review. According to the Auditor General's Audit Report for 2014/15 (2015), the irregular expenditure concerned was mainly due to non-compliance with procurement processes. From the findings, the Auditor General could not determine whether the entities received the right prices and value for money for the goods and services delivered. The 2015/16 AG Audit report noted the worsened results for irregular expenditure as attributable to the continued non-compliance to procurement processes. Furthermore, fruitless and wasteful expenditure grew by 46% between 2014/15 and 2015/16. Unauthorised expenditure on the other hand shrunk by 44%; the amount still remained at R925-million in 2015/16. The lack of progressive change in audit outcomes as illustrated in Table 1.1 shows that public sector supply chain management still requires interventions that will make implementation more efficient.

1.3.1.1 Limitation of Auditor-General's Powers and Functions

According to the Section 188 of the Constitution of the Republic of South Africa Act 108 of 1996, the Auditor General is required to audit and report on the accounts, financial statements and financial management of:

- all national and provincial state departments and administrations;
- all municipalities; and
- any other institution or accounting entity required by national or provincial legislation to be audited by the Auditor-General.

In addition, the Auditor General must present a report to the relevant legislatures that are to be made public. However, the Constitution does not prescribe the powers and functions of the Chapter Nine Institution any further than this. This has become an impediment for the implementation of recommendations in the annual Audit Outcomes Report; especially relating to SCM deviations, legislative as well as financial compliance. Every financial year end in the period under review SCM is identified as a risk area in the report. However, the ability of the Auditor-General to exercise authority for implementation of its recommendations is limited.

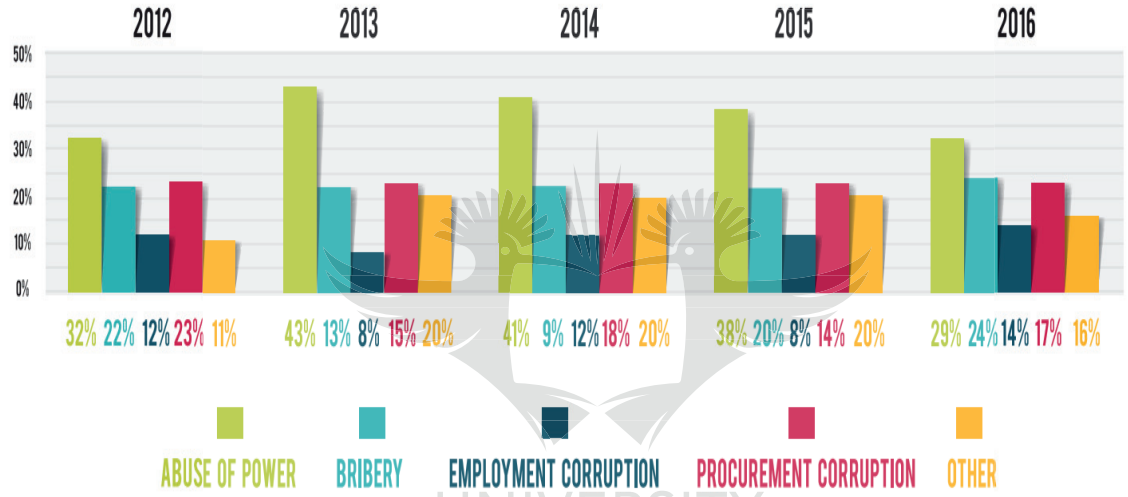
The Auditor-General can only raise non-compliance and financial misstatements during audit committees that take place annually. In the audit committees', government departments' may even make recommendations that carry through to other financial years. According to the Auditor-General (2017: 1), audit limitations such as "internal control" are an unavoidable risk that some misstatements in reported information may not be detected. Therefore, the completeness and the accuracy of the information reported are not certain. In addition, the Auditor-General's Annual Audit Report (2017: 1) focuses on specific areas in key legislation; the audit does not offer assertion that all applicable public finance legislation has been fulfilled.

1.3.4 Corruption and Procurement

According to Gauteng Provincial Treasury (GPT) (2017), the public sector procurement budget is estimated to be over R500-billion in goods and services with Gauteng Provincial Government (GPG) spending more than R47-billion on procurement. Corruption can manifest itself as a risk in the SCM process due to the loss of financial resources incurred as well as poor or non-delivery of services. According to Munzhedzi (2016: 2), corruption occurs during the process of procuring goods and services. The SCM processes are abused by inflating prices, contracts being awarded to friends or family, tenders not being advertised, bid

committees not being properly constituted or panel members not declaring their interest before the sitting of the adjudication committee (Munzhedzi; 2016: 2). This increases the SCM risk factors in the public sector, which is accounting for most of the irregular expenditure as indicated in the Auditor-General's 2015/16 National Audit Report. Gauteng Province, is the economic hub of South Africa, is allocated the bulk of the National Budget Transfers, therefore, creating an opportunity for irregular spending. Figure 1.1 shows the types of corruption cases that are reported to Corruption Watch.

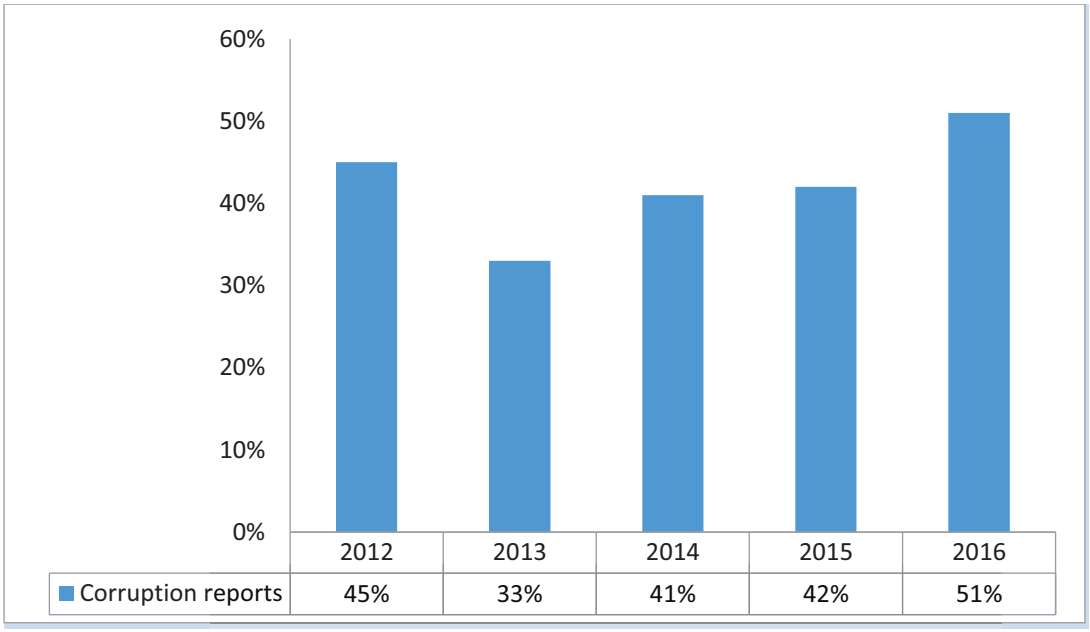
Figure 1.1: Types of corruption cases reported



Source: Corruption Watch 2016 (2017: 15)

Cases relating to the abuse of power have been on the decline for the period under review. Bribery cases reported have been on the rise. Employment corruption cases reported have also increased between 2012 and 2016. In 2013, cases reported relating to procurement corruption reduced by 8%; however, this increased from 2014 to 2016. These statistics indicate the lack of progress regarding the elimination of corruption in the country. Figure 1.2 shows corruption cases reported in Gauteng Province from 2012 to 2016.Furthermore, Figure 1.2 shows the percentage of cases of corruption reported in Gauteng Province between the years of 2012-2016; compared to the total number of corruption cases reported nationally.

Figure 1.2: Corruption reports in Gauteng Province in 2012-2016



Source: Adapted from Corruption Watch 2016 (2017: 15)

Figure 1.2 shows that Gauteng Province has a large number of corruption cases reported, which has been escalating on an annual basis since 2012. In 2012, 45% of the total corruption cases were reported in Gauteng; in 2013 33%, 2014 41% were reported; in 2015 42% and in 2016 51% of the cases belonged to Gauteng. As indicated in Figure 1.1, corruption cases relating to procurement have not improved; most of the corruption cases are in Gauteng where most of the National Budget Transfers are received.

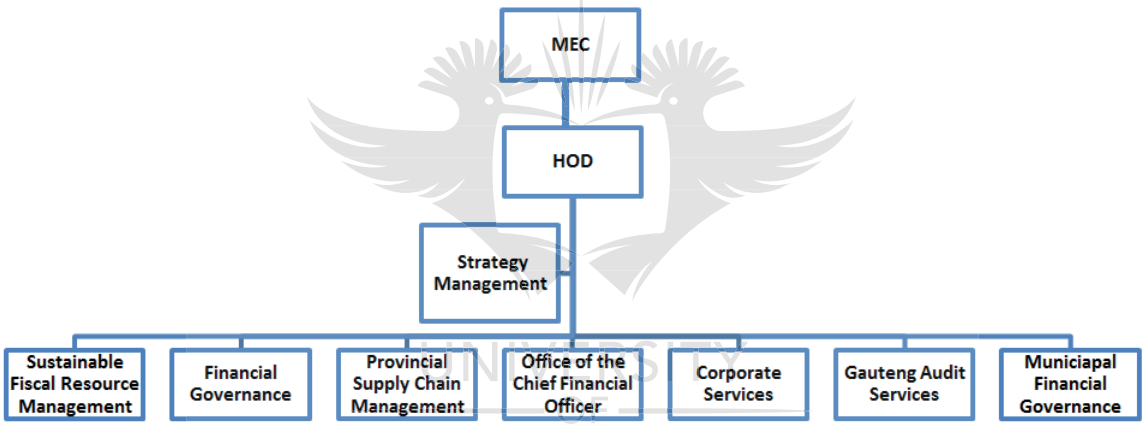
1.4 An overview of Gauteng Provincial Treasury

The GPT was established in accordance with the Constitution of the Republic of South Africa. The vision of Gauteng Provincial Treasury (2016a: 17) is to "provide strategic leadership in financial and fiscal matters to ensure sustainable and inclusive social and economic development of the people of Gauteng so that all may enjoy value for money services of the highest quality." Furthermore, the GPT is leading other Provincial Government Departments in the achievements of sound finance practices, especially in SCM procedures. According to Gauteng Provincial Treasury (2016a: 17), Gauteng Provincial Treasury is an oversight department responsible for the support of Provincial Government in the sound implementation of financial management. Gauteng Provincial Treasury (2016a: 17), stated that "Gauteng has remained South Africa's economic hub, contributing 35% of South African GDP". Making the

province a strategic point economically, especially regarding public sector procurement business opportunities. This leaves the province susceptible to potential risk in procurement.

The GPT will be the public sector organisation engaged for the study, in order to explore the implementation of SCM in the public sector. The GPT plays a role in financial oversight in the province to ensure that all provincial departments, as well as provincial entities, practice financial management legislation accurately. The oversight role of the GPT to other Gauteng departments, however, does not mean that GPT is not experiencing similar challenges as other provincial government organisations concerning SCM. These challenges in SCM are also caused by the SCM risk factors in the department (GPT). It can, therefore, be argued that the public sector has legislation and systems in place that are not yielding desired results. Figure 1.3 illustrates GPT's organisational structure.

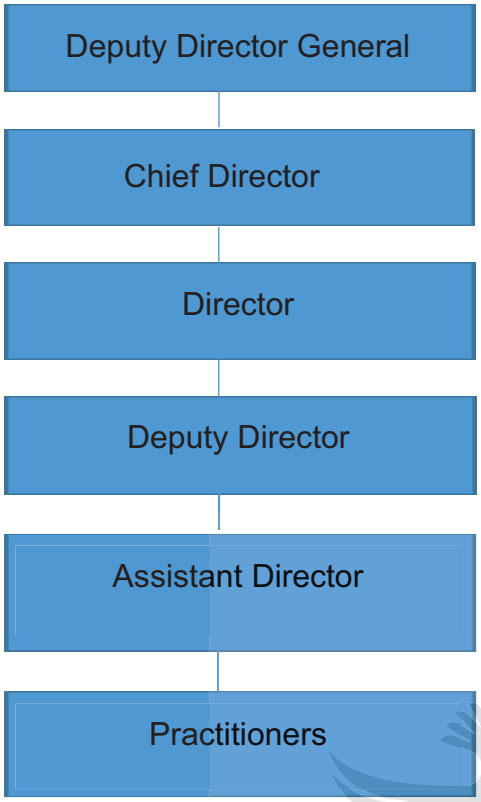
Figure 1.3: Current organisational structure



Source: Gauteng Provincial Treasury Annual Report (2016a: 15)

Figure 1.3 shows the organisational structure that consists of five core business divisions: Sustainable Fiscal Resource Management (SFRM), Financial Governance, Provincial Supply Chain Management, Municipal Financial Governance and Gauteng Audit Services. Supporting functions include Strategy Management, Office of the Chief Financial Officer and Corporate Services. GPT operates through a hierarchical organisational structure that is prescribed by the National Treasury; however, this is modelled around the needs of the specific province. The organisational hierarchy filters down to operational levels of the organisation as shown in Figure 1.4.

Figure 1.4: Organisational Hierarchy



Source: Authors own

Figure 1.4 shows the hierarchical structure for the South African public sector, which also applies to GPT. Each business division as shown in Figure 1.4 consists of a Deputy Director-General, who heads the division; followed by a Chief Director, then a Director, followed by a Deputy Director that supervises Assistant Directors. At the bottom of the hierarchy are practitioners and other technical personnel.

Audit Reports for National and Provincial Spheres of government are published simultaneously as the two share the same legislative framework, being the Public Finance Management Act 1 of 1999 (PFMA). This differs from Local Government that is guided by the Municipal Finance Management Act 56 of 2003. The audit outcomes are classified accordingly in order to describe the financial wellness of the public sector organisation. This assists the organisation in planning for the next financial year, as officials are knowledgeable of the areas that require attention according to the outcomes of the AG. The audit terminology is described in Table 1.3.

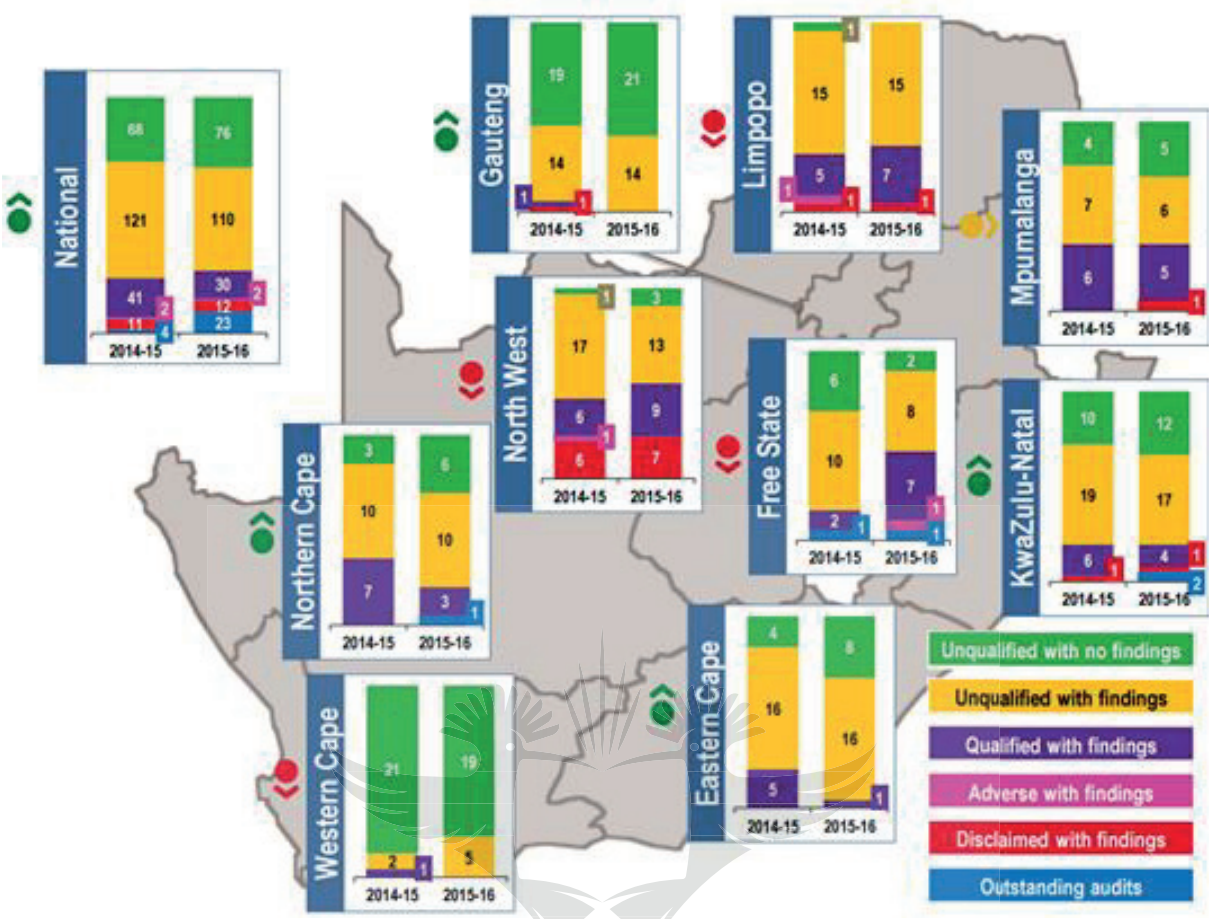
Table 1.3: Audit terminology

Outcome	Description
Clean audit outcome/unqualified with no findings	Free from material misstatements and there are no material findings on reporting on performance objectives or non-compliance with legislation.
Financially unqualified audit opinion with findings	Contains no material mis-statements. Unless it was expressed as a clean audit outcome, findings have been raised on either reporting on predetermined objectives or non-compliance with legislation, or both these aspects.
Qualified audit opinion with findings	Comprises material misstatements in specific amounts, or there is insufficient evidence to conclude that specific amounts included in the financial statements are not materially misstated.
Adverse audit opinion with no findings	Includes material misstatements that are not confined to specific amounts, or the misstatements represent a substantial portion of the financial statements.
Disclaimer of audit opinion with findings	The auditees provided insufficient evidence in the form of documentation on which to base an audit opinion. The lack of sufficient evidence is not confined to specific amounts or represents a substantial portion of the information contained in the financial statements.
Outstanding audit	The auditees did not provide evidence in the form of documentation on which to base an audit opinion.

Source: Auditor General South Africa (2017: 1)

Table 1.3 shows the six possible audit outcomes a public sector organisation can receive. Out of the six possible audit outcomes, a well-functioning public sector organisation aims to achieve a clean audit outcome. In Gauteng Provincial Government, the number of clean audits seems to be improving only slightly. The ultimate goal is to have all departments achieve a clean audit. The audit outcomes of provincial departments are presented together with the outcomes of national government departments as presented in table 1.3. Figure 1.5 indicates the national and provincial audit outcomes.

Figure 1.5: National and provincial audit outcomes



Source: Consolidated general report on the national and provincial audit outcomes 2015-16 (2016: 19)

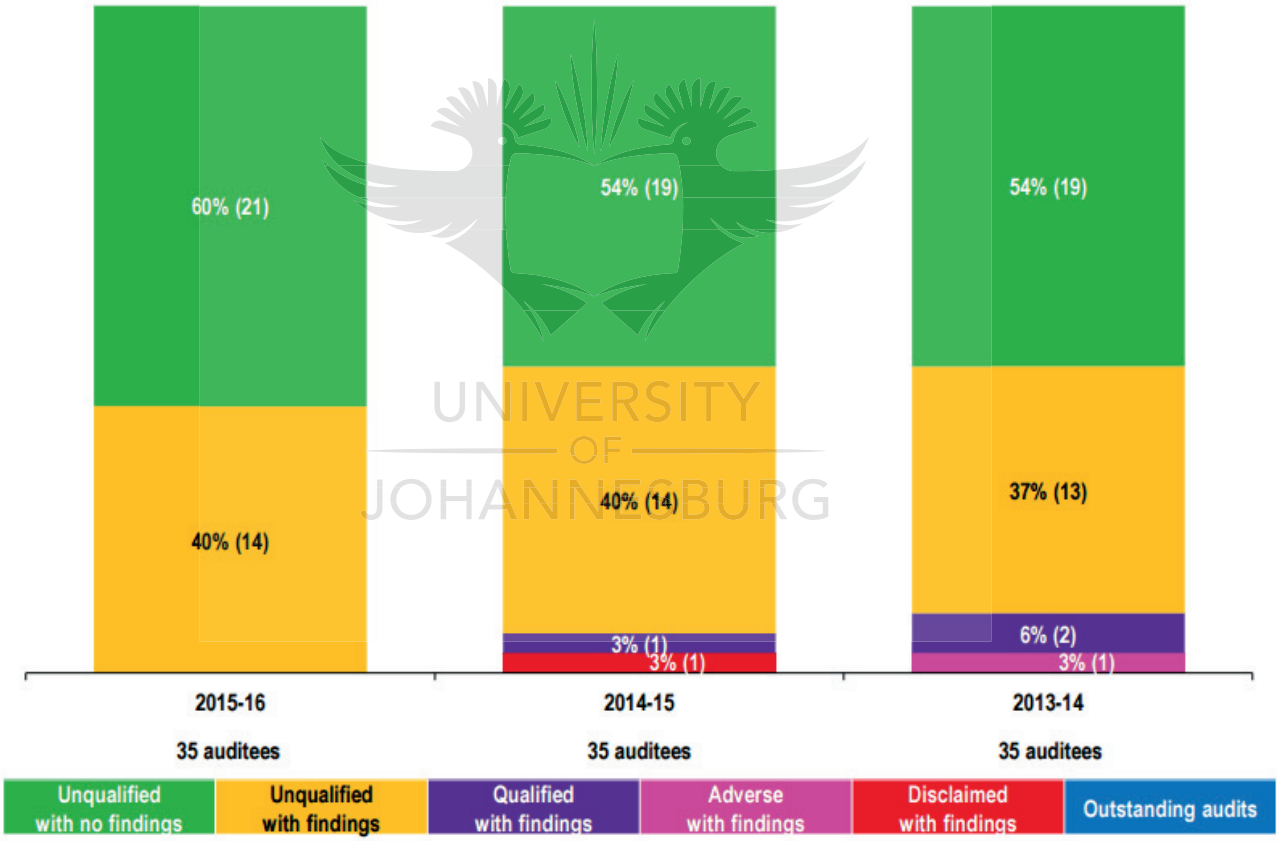
Figure 1.5 shows the national and provincial audit outcomes for the 2015-16 financial year. In relation to good governance, departments aim to attain a clean audit from the Auditor-General, which is an 'unqualified report with no findings. GPG specifically showed some improvement between the two financial years, with one disclaimer, with findings as well as adverse with findings only in 2014-2015. Only two departments improved to an outcome of unqualified with no findings. Overall in the country, government departments have improved between the two financial years. However, this is a slight improvement considering 251 departments that were assessed nationally. From the outcomes depicted in Figure 1.5, the province still needs to improve challenges related to financial management in order to improve the well-being of public sector institutions.

In the 2015/16 financial year-end Audit Report (2016: 19), the Auditor General stated the following issues regarding SCM in public sector institutions:

- Auditees had material occurrences of non-compliance with SCM legislation;
- Deficiency of sound SCM practices;
- Irregular expenditure levels were high as a result of their poor SCM practices; and
- Accounting officers did not investigate the irregular expenditure of the previous year to determine if anyone was liable for the expenditure.

Gauteng provincial departments have experienced some improvements; however, not sufficiently. This may be due to the lack of implementation of SCM practices as described by the Auditor General's report above. Figure 1.6 illustrates three-year audit outcomes for GPG.

Figure 1.6: Gauteng three-year Audit Outcomes



Source: Consolidated general report on the national and provincial audit outcomes 2015-16

The trend in figure 1.6 shows Gauteng Departments are only improving slightly in audit outcomes. This indicates that there is a requirement to advance the quality of financial management practices, especially those of public sector SCM. In the midst of improving financial management outcomes, Treasury has been able to establish itself as a leader of

good SCM practice in GPG. This may have a trickle-down effect on other GPG departments, with Treasury being the custodian of the PFMA in the Province. However, Treasury has been on a journey of transformation of the organisation in order to arrive at a point of achieving clean audit outcomes.

1.4.1 Supply Chain Management risk factors in Gauteng Provincial Treasury

According to the GPT (2016b: 7) in the GPT Strategic Plan for 2015-2019, the Gauteng Audit Services (GAS) identified non-compliance to SCM policies as a major contributor to departments receiving qualified audit opinions. Furthermore, the GPT Strategic Plan for 2015-2019 (2016b: 71) identified SCM as a risk factor for service delivery for GPT. Table 1.4 lists and describes the risk factors at GPT that have reduced efficiency and value for money in SCM as identified by the GPT's Strategic Plan for 2015-2019.

Table 1.4: SCM risk factors for service delivery

Risk	Description
Increased accruals	Delayed payment of suppliers
Inadequate procurement plans	Lack of synergy between the business unit and SCM unit. Operating in silos.
Poor contract management	Lack of service standards specifications for the supplier.

Source: GPT Strategic Plan for 2015-2019 (2016b: 71)

Bloated accruals mean that the department may not have paid suppliers from the previous financial year in the new financial year. This could result in cash flow problems and directly pose a risk to the financial well-being of the department. Furthermore, inadequate procurement plans mean that the plans of the business unit may not translate into procurement plans, resulting in poor service standards by suppliers, as specifications are unclear. Poor contract management may result in sub-standard services and products from suppliers. These are key risk factors that need to be considered in understanding SCM in the public sector and specifically where GPT is concerned.

1.5 Supply Chain Management Risk

In understanding risk associated with SCM whether, in the public or private sector, it is important to define the concept of SCM.

1.5.1 The concept of Supply Chain Management

According to Razak, Rowling, White and Mason-Jones (2016: 44) SCM "encompasses the planning and management of all supply chain operations". Furthermore, Razak et al. (2016: 44) indicated that the process integrates supply and demand management throughout the organisation. Sharma and Singhi (2018: 24) define SCM as an integration of tasks and decisions that lead to quality services are executed. Furthermore, Sharma and Singhi (2018: 24) stated that SCM has become critical in the modern organisation as the process envisions quality services are delivered to the end user. As shown in the definitions SCM is an integration of processes; with Lysons and Farrington (2016: 89) stating that SCM has no universal definition.

Without a universal definition, SCM can be characterised by various stakeholders involved in the "chain" directly and indirectly in executing the client's request (Chopra & Meindl, 2013: 13). These stakeholders include the manufacturer and suppliers, transporters, warehouses, retailers and customers themselves. According to Nowicka (2018: 60) in the private sector the process ten activities include customer relationship management, customer service management, supplier relationship management, customer service management, demand management, order fulfilment, manufacturing flow management, supplier relationship management, product development and commercialisation and returns management. According to Kumar and Kushwaha (2018: 80), the process of SCM in the private sector is to remain competitive and profitable in the complex market place. In contrast, in the public sector the supply chain management process is divided into four major activities. According to the National Treasury (2003: 20) the SCM process includes demand management, acquisition management, logistics management, disposal management and supply chain performance. The nature of the public sector requires this process to be highly regulated and legislated; in addition, delivering cost effective, quality services.

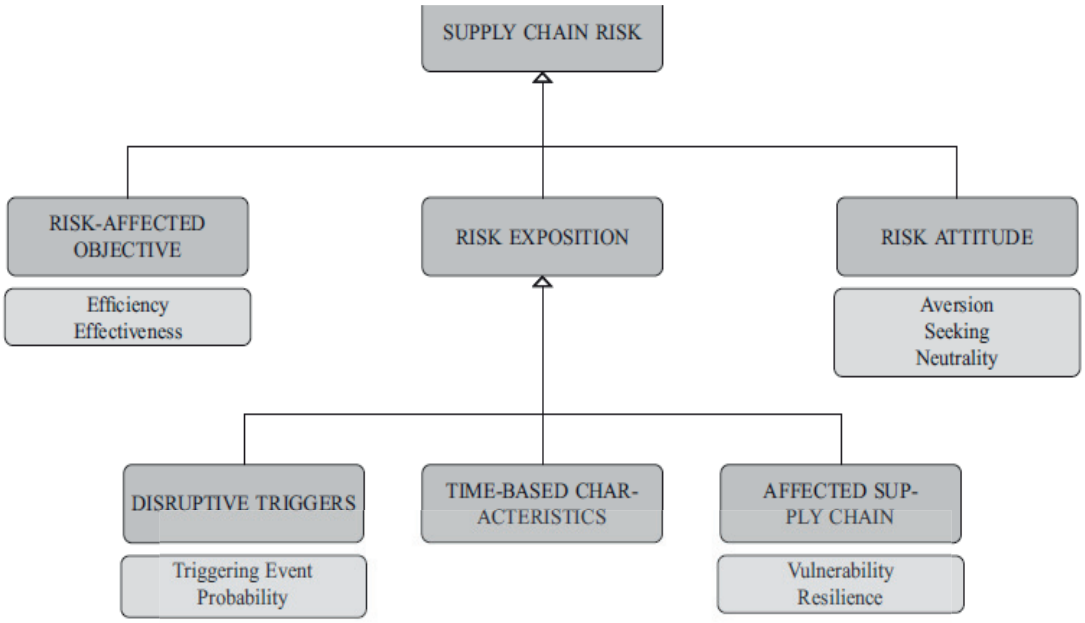
In the developing years of SCM in the 1800s; SCM was executed as management of the transportation of goods at the lowest cost (McCann; 2017: 43). According to Yagoob and Zuo (2015: 42), the focus on SCM was largely based on price rather than the total cost of goods. McCann (2017: 43) explains that companies have focused attention on using quality as a

competitive advantage rather than the lowest cost. Chopra and Meindl (2013: 15) stated that the importance of SCM is as a means of optimisation of value generated through the minimisation of the costs incurred in executing a client's request. When costs are reduced, profit margins are higher; however, quality should not be compromised. The minimisation of costs relating to SCM is emphasised by Van Weele (2014: 240) who stated that it is the connection of activities concerned with planning, co-ordinating and controlling materials from the company's suppliers to its clients. These definitions are relevant to the private sector and are more complex. SCM is however slightly different in the public sector, as it is focused on procurement. In the public sector, it is focused on the outsourcing of goods and services to suppliers. According to Kaye (2014: 07), in the public sector context, SCM is concerned with the "co-ordination of all parties involved in delivering the combination of inputs, outputs or outcomes that will meet a specific public sector requirement".

1.5.2 The concept of Supply Chain Risk

According to Heckmann, Comes and Nickel (2015: 122), supply chain risk (SCR) can be defined as "variation in the distribution of possible supply chain outcomes, their likelihood, and their subjective values". This means that the supply did not meet the demand specifications; resulting in misalignment and therefore wastage or substandard quality. Figure 1.7 shows the key characteristics of SCR which correlate to the definition presented in the literature.

Figure 1.7: Core characteristics of Supply Chain Risk



Source: Heckmann, Comes and Nickel (2015: 123)

When resources are not utilised to add value to the key goals of the organisation, the organisation will not achieve its purpose. With the inevitable presence of risk in the supply chain process, the objective can either be efficiency or effectiveness seeking. According to Heckmann, Comes and Nickel (2015: 123), this is the ability of the firm to balance the level of inventory as well as the actual service. The risk attitude of the organisation can either be to avoid risk challenge risk head-on, or be neutral about risk. The challenge with avoiding risk is that the organisation becomes stagnant as the business environment is constantly changing. However, in the public sector risk is mostly avoided due to the use of public funds that leave little room for creativity, focusing on accountability.

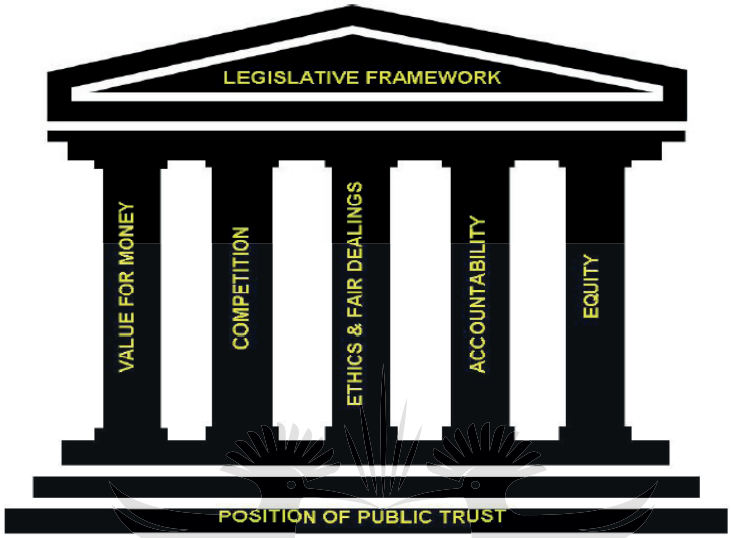
1.5.3 Supply Chain Management Framework in the South African public sector

The South African public sector SCM system is defined in the Treasury Regulations section 16A3.2 as consisting of five components: demand management; acquisition management; logistics management; disposal management; risk management; and regular assessment of supply chain performance.

These five components are supposed to form a system that if implemented accordingly could optimise the delivery of goods and services. This may effectively eliminate causal risks of poor management of the supply chain; however, if the challenges prevail, it can cause the opposite

and lead to inefficiencies. Furthermore, public sector SCM is embedded in five pillars that encourage the effective implementation thereof. Figure 1.8 illustrates the five pillars that are necessary for the implementation of sound SCM practices in the public sector.

Figure 1.8: The five pillars of procurement



Source: GPG Supply Chain Management Manual (2011: 23)

The pillars include the value for money, competition, ethics and fair dealings, accountability and equity. Essentially this shows how the legislative framework and the position of public trust are promoted.

Kaye (2014: 17) argued that both public and private sectors use different SCM models based on their different needs; the private sector to make the profit and the public sector to deliver basic services. According to Migiro and Ambe (2008: 232), public sector the network framework offered by various stakeholders who include defines public sector SCM:

- Private firms which receive orders from public sector agents;
- Public sector accounting officers; and
- Policy makers.

Public sector SCM is more challenging even though it is less complex compared to the private sector because implementation according to legislative requirements is a critical factor (Kaye; 2014: 17).

According to Mhlongo (2014: 21), the need for the public sector to adopt business principles in SCM has increased, in order to ensure the achievement of value for money through Supply Chain Risk Management (SCRM). According to Juttner (2005: 122), SCRM is the management of disruptions in the flows of information, materials, products and money between organisation, supplier and client. The disruptions that occur in this chain reduce the efficacy of the final product and reduce value for money. The declining economic growth prospects require the public sector to use frugal principles in achieving value for money in delivering public services. Public sector organisations largely use contracting and outsourcing as a means of delivering services. Contracting and outsourcing, according to Sumpikova, Nemec, Petrova and Merikova (2013: 65), are different; as outsourcing is for internal public sector operations and contracting is for external public-service delivery.

1.5.4 Supply Chain Management Risk in South African public sector

Kaye (2014: 4-5) stated that various risk factors of supply chains in outsourcing in public sector procurement include the lack of control in processes due there being minimal quality assurance measure in the quality of goods provided by suppliers. According to Kaye (2014: 4-5), the lack of control in customer relationship as the customers may be engaging with contracted suppliers, this is also a risk to the reputation of the public sector organisation. Kaye (2014: 4-5) subsequently states that, the loss of quality might be inevitable due to the lack of control in the procurement process. The operational and financial stability of the supplier may also be at risk due to the inability of public sector organisations in making payments on the required time frames.

It is impossible for any organisation to be able to achieve value for money in its SCM processes without identifying and planning for its risks. However, according to Dittmann (2014: 8), 90 percent of firms do not quantify the risk associated with SCM, even though the risk is probable.

1.6 Research problem statement

The problem is that public sector supply chain risk factors are reducing financial efficiency and effectiveness in the GPT. Despite extensive initiatives on SCM in the public sector; loopholes in procurement implementation persist; therefore, conversion of legislation into practice still requires testing.

1.6.1 Research questions:

What are the SCM risk factors that are reducing financial efficiency and effectiveness in the GPT?

Sub-questions

- What effect does a skills shortage have on GPT SCM?
- What effect does a decentralised procurement system have on GPT SCM?
- What are the limitations in the authority of the Auditor General on GPT SCM?
- What impact do corruption and fraud have on GPT SCM?

1.6.2 Research objectives:

Primary objective

The objective of the study is to examine the risk factors in the implementation of Public sector SCM in GPT.

Secondary objectives

- To determine the extent of the effect of skills shortages on risk in the GPT SCM.
- To determine the extent of the effect that a decentralised procurement system has on the GPT SCM.
- To determine the extent of the effect that limitations in the authority of the Auditor General have on the GPT SCM.
- To determine the extent of the effect that corruption and fraud have on risk in GPT SCM.

1.7 Research methodology and design

A quantitative research methodology was used as a method to conduct the study. Choy (2014: 99) stated that the methodology aims to determine the perceptions surrounding phenomena being studied. The purpose of the study is to examine the risk factors in the implementation of public sector SCM in GPT; therefore, perceptions relating to the implementation of SCM in GPT will be tested. The paradigm for this study is pragmatism as this study is about the practical implementation of SCM processes in the public sector in order to address current

inefficiencies despite the various initiatives to improve the challenges. Saunders, Lewis and Thornhill (2016: 143) stated that pragmatism is aimed at identifying practical problems and areas of interest.

A survey research strategy was used for the study that is usually associated with a deductive research approach. According to Saunders et al. (2016: 181), the survey strategy allows the quantitative method to be collected to be analysed quantitatively through descriptive and inferential statistics. Despite extensive initiatives regarding SCM in the public sector; shortfalls in procurement persist; therefore, the legislative framework and implementation still require more research to be conducted. This method will assist in identifying loopholes as indicated by officials completing the structured questionnaire. Saunders et al. (2016: 200) stated a cross-sectional study applies to academic research due to the limited time to complete the study. The research employed a cross-sectional study not only due to the time constraints, but also to uncover what is happening in the specific population in GPT.

According to Saunders et al. (2016: 203), threats to the reliability of the study comprise of participant error, bias; as well as observer error and bias. Threats of error and bias was mitigated through the distribution of questionnaires to respondents after lunch time as well as at the end of the business day to ensure that the researcher does not interrupt respondents' deliverables. In addition, the questionnaires were made completely anonymous, including the position that respondents hold to ensure that respondents answer completely based on their perceptions. However, studies that aim to uncover perception may experience bias of the respondents; therefore, the level of bias needs to be measured.

A Social Desirability Scale (SDS), designed by Crowne and Marlowe (1960) can be used in attitudinal studies. In this study the SDS was used to determine the level of bias from the respondents. This scale was "developed according to a psychometric model avoiding the ambiguities of the statistical deviance approach" (Haghighat; 2007:1). However, for purposes of this research, a Brief Social Desirability Scale (BSDS) according to Haghighat (2007: 1) was used due to its briefness and due to time constraints. According to Haghighat (2007:1), when responding to questionnaires, people have the propensity to respond in a socially desirable style. Therefore, the administration of BSDS with questionnaires is necessary to scrutinise "personal feelings and behaviour to ensure that what is being measured by the questions is nearer to what is supposed to the measured" (Haghighat; 2007: 1).

1.8 Research methods

The nature of the research required secondary data to be used in addition to primary data to be generated from structured questionnaires. According to Saunders et al. (2016: 316), most research questions are solved using a mixture of secondary as well as primary data. Due to the complex nature of SCM in the public-sector, studies on the perception of practitioners are not widely available. However, the secondary data are already in the public domain, and a combination serves to provide an understanding from an SCM practitioner's perspective. The secondary data included government publications such as budget documents (end-of-financial-year-reporting); public finance legislation; area-based sources; an audit reports. The primary data includes semi-structured questionnaires that were administered to GPT officials that provided perceptions of the application of SCM pertaining to the risk factors.

Questionnaires were assisted in receiving feedback from SCM practitioners in the public sector and identify loopholes through the various experiences of officials in different positions. According to Saunders et al. (2016: 437), questionnaires assist the researcher to collect feedback from many of respondents timeously increasing the levels of accuracy. In addition, using questionnaires also assisted to keep the respondents anonymous and still receive relevant information. The feedback from the questionnaires was manually captured by means of Microsoft Excel before being interpreted.

The following functions were relevant as the officials perform duties related to the implementation of SCM in GPT: for the purposes of this study the Provincial Supply Chain and Asset Management (PSCAM), Sustainable Fiscal Resource Management (SFRM) and Financial Management Services (FMS) as indicated in the GPT 2015 Strategic Plan (GPT; 2014: 65). Table 1.5 shows the total population size of the respondents that participated in the study.

Table 1.5: Respondent population size

Programme	Chief Directorate (CD)	Total number of officials in CD
Provincial Supply Chain and Asset Management	Supplier Management and Development	76
Provincial Supply Chain and Asset Management	Policy, Norms Governance Monitoring an Evaluation	20
Sustainable Fiscal Resource Management Infrastructure	Infrastructure Management	9
Administration	Financial Management Services	11
Financial Governance	Transversal Internal Audit and Risk Management	3
Total		119

Source: Author's own construction

Respondents that completed questionnaires were from senior, middle, junior as well as practitioner levels in the organisation. This is only limited to officials that are responsible for supply chains in GPT. The PSCAM branch is responsible "to promote and enforce transparency and effective Supply Chain Management and Asset Management in the Province" (GPT 2015/16 Annual Report; 2016: 42).

Sustainable Fiscal Resource Management: Infrastructure Chief Directorate assisted in sourcing information regarding infrastructure procurement. According to GPT (2016: 31), this business unit was established to "ensure the effective and efficient administration of provincial and fiscal resources". From these perspective officials furnished the study with insight into procurement practices.

Financial Governance: Transversal Internal Risk Management was also a point to source information related to the risk posed by SCM to the Department as well as to service delivery. Two Deputy Directors completed questionnaires to contribute to the study. The purpose of the programme is to "promote accountability through the substantive reflection of financial activities as well as compliance with financial norms and standards in PFMA compliant institutions" (GPT 2015/16 Annual Report; 2016: 38).

According to Sekaran and Bougie (2013: 106) "first-hand" information can be obtained through interviews, questionnaires and observations; this kind of information aims to test the theory and other secondary data in order to identify loopholes in public sector SCM. For purposes of this study, questionnaires were used rather than interviews. Gathering information in the form

of interviews may pose a challenge in the public sector due to matters of maintaining the anonymity of officials as some of the responses was based on perception and not necessarily the position of GPT. According to Saunders et al. (2016: 249), ethical considerations need to be taken into consideration to ensure the credibility of information. This can be done by keeping respondents anonymous. Semi-structured questionnaires ensured that the respondents are given a structured mechanism of providing an outline of the nature of SCM in the public sector.

In addition, policies, legislation and regulations were analysed to form an understanding of the SCM framework in the public sector. In the policies, legislation and regulations used, sections relating to the implementation of SCM were analysed. The National Treasury and Gauteng Provincial Treasury websites were used to source secondary data such as budget reports, annual reports, audit reports, strategic plans and supply chain management research reports. The basis of the study includes audit report recommendations, requiring the use of reports from the AGSA website that were used to provide context. This is secondary information authored by the National Treasury and the AGSA.

1.9 Chapter outline

Chapter 1: Background

This chapter provides a brief background and overview of Supply Chain Management in the public-sector. It will discuss the trends and developments in public sector Supply Chain Management and identify the risk factors that are considered challenges. The discussion highlights that there are gaps in the system which enables malpractice despite the extensive legislative framework.

Chapter 2: Public sector Supply Chain Risk

This chapter discusses the concept of SCM in the public sector, highlighting pertinent legislation. It explores literature that illustrates the importance of the process in the private sector and more importantly in the public sector. Literature about SCRM is discussed in order to show the importance of planning for risk presented to supply chains in the public sector. This literature is used to illustrate the link between sustainable use of SCRM and efficient public sector expenditure.

Chapter 3: Research methodology

A framework regarding the methodology that was used is discussed. This is to ensure that an effective method is employed in order to collect accurate information as well as to reach fruitful conclusions.

Chapter 4: Research results and findings

The results are presented, interpreted and discussed in order to make inferences that were used to make a conclusion in chapter 5.

Chapter 5: Conclusion

From the interpretation and discussion of the results, conclusions and recommendations were formulated. Suggestions for future research are offered.

CHAPTER 2: PUBLIC SECTOR SUPPLY CHAIN RISK

2.1 Introduction

The constantly changing global environment has increased the business network as well as its complexities; making SCM progressively challenging. This challenging environment means that the organisation should be on guard for risk factors relating to the supply chain of the organisation. Risk management is a basic aspect of the organisation that is used to warn the organisation of disruptions that may occur in future. The identification of risk factors within procurement will ensure the efficiency and effectiveness of organisational operations.

This chapter begins with the theoretical concept of SCM, to understand the importance of the concept. This is followed by an examination of strategic SCM, which is necessary for the modern-day application of SCM, due to the growing need to move away from SCM as an administrative support function. The chapter moves to the theoretical concept of SCR to understand its relevance as well as application. Public sector supply chain risk factors are discussed to illustrate risk factors that can be mitigated if identified as risk factors.

2.2 Supply Chain Management

According to Christopher (2011: 2), supply chain is "the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole"; which is a broader concept than *logistics*. Ambe (2015: 1) stated that traditionally SCM had been described as *logistics* which is an internal function in the organisation as well as external to the organisation. Christopher (2011: 2) stated that it is a process-oriented or cross-functional perspective; SCM comprises planning, sourcing, production, and distribution logistics but is not exclusively focused on one of these areas. However, according to Ambe (2015: 3), SCM grew from logistics due to the use of an integrated system approach to minimise cost, to satisfy end customers and to take on profitable ventures.

Bala (2014: 947) stated that it is essential to develop an organisation's supply chain into an efficient, customer-satisfying practice, for the success of the organisation. As the effectiveness of core business departments is valuable for any organisation. Essentially SCM is about the entire value chain adding value not only to the organisation but also to the customer; from the process to the network. Therefore, it is essential that organisations plan for risks associated with SCM.

2.2.1 Strategic Supply Chain

Gunasekaran, Patel and Tirtiroglu (2001: 71) stated that SCM is considered a strategic factor for increasing organisational effectiveness and improved achievement of organisational objectives such as better competitive advantage, enhanced customer service and higher profitability. In the public sector, the goal is cost reduction in operations as well as to increase service-delivery standards. According to Govindan, Azevedo, Carvalho and Cruz-Machado; (2015: 15), among the different supply chain management models, the “lean, green and resilient” are considered required for supply chain competitiveness.

Brandenburg, Govindan, Sarkis and Seuring, (2014: 15) stated that conventionally SCM is defined as the “management of physical, logical, and financial flows in networks of intra- and inter-organisational relationships jointly adding value and achieving customer satisfaction”. However, Lambert and Cooper (2000: 65) described SCM as the “management of multiple relationships across the supply chain”. This is the opposite of operations in public sector SCM. The lack of collaboration between the public sector and suppliers limits the ability to develop sustainable service delivery. The relationship between the customer, company and consumer requires innovative initiatives to create a sustainable competitive advantage.

The strenuous economic environment has meant that organisations must plan more accurately for the use of resources. This according to Eskandarpour, Dejax, Miemczyk and Peton (2015: 1) accurate planning for resources can be realized through the use of strategic supply chain management to improve competitiveness as well as time and quality of service. Globalisation has made the global context for any organisation much more complex requiring a comprehensive approach to the implementation of SCM. This complexity intensifies the presence of supply chain risk factors, and a strategic approach needs to be adhered to.

2.3 Supply Chain Risk

Wang, Jie, and Abareshi (2014: 89) stated that decision makers in the supply chain could make decisions that result in ineffectiveness and inefficiency, which ultimately affect organisational performance. Wang et al. (2014: 89) stated the characteristics of SCR as “impacts, consequences, unexpected outcome and/or problems” triggered by disastrous incidents that may be detrimental to the supply chain performance of the organisation, rendering it ineffective and inefficient. It is to this end that supply chain risk factors require to be identified, assessed as well as mitigated before project implementation, rather than learning from error. Furthermore, Ambulkar, Blackhurst and Grawe (2015: 111) indicated the

contemporary environment is hostile and poses uncertainty to a firm's supply chain; therefore, it is crucial that firms' plan from a risk perspective. This approach enables firms to allocate resources more effectively as well as to enhance resilience to uncertainty.

Chopra and Sodhi (2004: 54) stated that due to the interrelated characteristic of SCR, it becomes a challenge to manage. Chopra and Sodhi (2004: 55-59) listed nine risks associated with SCM; these can also be attributable to the risks in the South African public sector SCM. Chopra and Sodhi (2004: 55-59) indicated that these risks include disruptions, delays, systems, forecasting, intellectual property, procurement, receivables, inventory, and capacity. Sodhi (2004: 55) indicated that delays in the supply chain process refer to the inability of the organisation to respond to changes in demand; such as poor quality and inefficiencies. Disruptions according to Sodhi (2004: 55) are "unpredictable" and cause great damage such as natural disasters and civilian unrest. The third supply chain risk described by Sodhi (2004: 56) is systems risks; in which the network systems may cause failure to occur on a grand scale because of the integrated nature networks hold.

Furthermore, the risk posed by the future, which Sodhi (2004: 56) describes as forecast risk; which is the organisation's mismatched projections and the demand. The fourth risk which pertains mainly to public sector organisations is the risk of intellectual property as stated by Sodhi (2004: 57). Intellectual property is a risk in the public sector due to the use of outsourcing that is largely used rather than producing goods in-house. Sodhi (2004: 57) also states procurement risk as the unexpected increases in acquisition costs that may be due to inflation, exchange rates and supplier price hikes.

However, some of the SCM risk factors do relate to the public sector. Disruptions may occur in the case in which due diligence is not conducted, and the supplier cannot deliver contracted or outsourced goods and services. Preusch (2015: 1) stated that due diligence is taking active steps to investigate that the company showing interest in doing business has provided accurate information. This is further complicated in the public sector as preferential procurement legislation is implemented in South Africa. The Preferential Procurement Policy Framework (2000) is the implementation of Section 217 (3) of the Constitution of the Republic of South Africa (1996). According to Magoro and Brynard (2010: 8) preferential procurement legislation contradicts the Constitution of the Republic of South Africa (1996), as the Constitution promoted principles such as fairness, transparency, competition and cost-effectiveness in public procurement.

Through preferential procurement legislation the public sector holds an opportunity to reduce the prevalence of inequality and grow the economy. According to Brammer and Walker (2011:

453), “procurement represents an important policy tool that could help to achieve outcomes in a society that are consistent with broader policy goals”. In the public sector procurement may be managed by professionals but is required to be in the control of elected officials and accountable to the democratic process which is argued by Gianakis and McCue (2012: 111). According to Gianakis and McCue (2012: 111), challenges in public sector SCM are an impediment to public sector innovation without the public sector evolving into a modern organisation, difficulties may occur in the process of efficiently delivering services.

White, Parfitt, Lee, and Mason-Jones (2016: 288) stated that procurement plays a strategic role in both the public and private sectors and is susceptible to risk that needs to be mitigated. This is due to procurement including the purchasing of goods and services to undertake primary functions. In undertaking its function of procurement in the public sector can be complex as the purpose is to deliver services in an environment with political priorities; this therefore poses a risk to sound SCM implementation.

Therefore, planning for SCRM is important. SCRM is defined as the “likelihood and consequence of events at any point in the end-to-end supply chain, from sources of raw materials to end use of customers” (Supply Chain Risk Management Council; 2011: 4). This is especially important in the public sector context in which SCM operates on a large scale that is also able to stimulate or subdue economic growth. The supply chain in the public sector is the interface between the organisation and the public. If public funds are not spent in accordance with the legislative framework and spending is not prudent, the eventual value for money may not be realised.

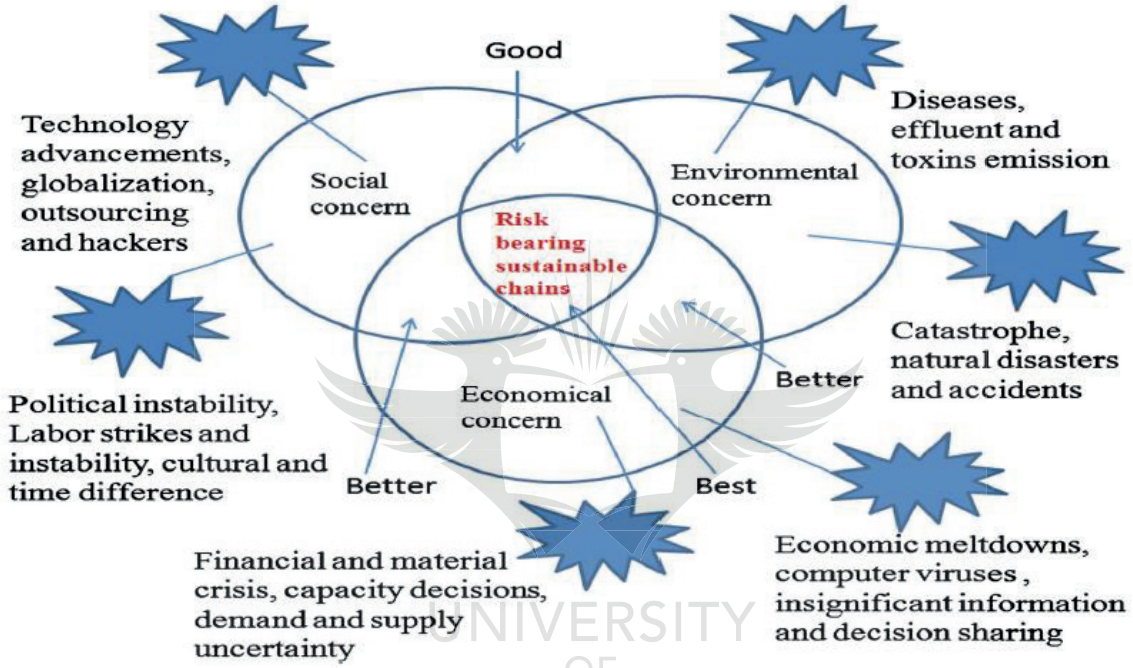
According to Wilding (1998: 7), there are concrete risks in the supply chain process that affect the performance of a company. Heckmann, Comes and Nickel (2015: 122) list the core characteristics in understanding supply-chain risk as the following:

- Supply-chain risk is linked to the goals that need to be achieved by the organisation’s supply chain.
- The accomplishment of the goals depends on how the supply chain responds to uncertainty and unforeseen occurrences.
- The risk attitude of the decision maker determines the ability of the organisation to achieve its goals.

According to Heckmann, Comes and Nickel (2015: 119), due to human judgment, each procedure and decision in business is susceptible to uncertainty. These errors may lead to

uncertainties in the value chain, which need to be detected early. Therefore, continuous monitoring and management are required. Furthermore, the growing number of unforeseen incidents in business has. The promptness, in which change is manifesting, requires a more elaborate supply chain network. This has led to the expansion of a generic framework for sustainability-focused-risk bearing supply chain, illustrated in Figure 2.1.

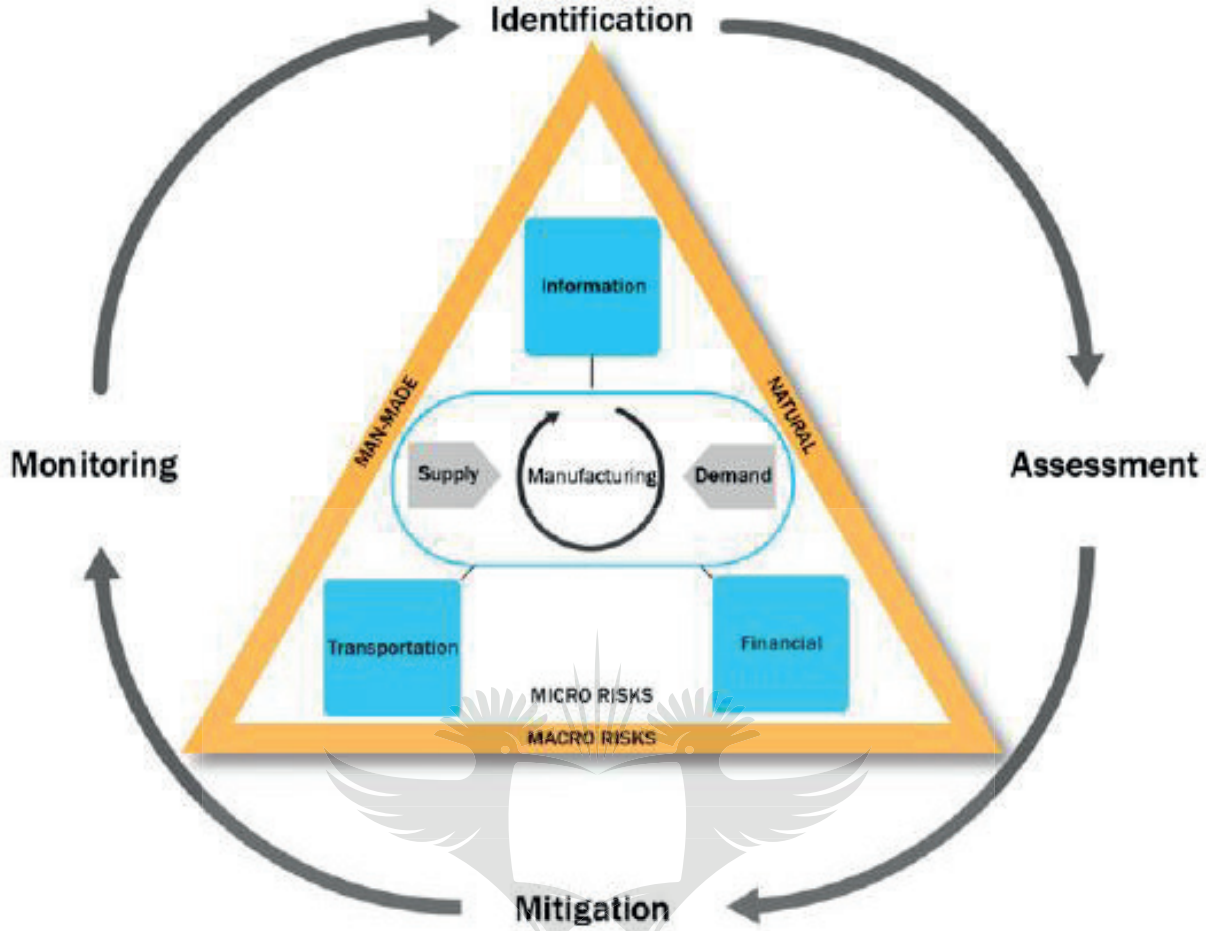
Figure 2.1: Generic Framework for sustainability-focused-risk bearing supply chain



Source: Mangla, Kumar and Barua (2014: 115)

The generic framework proposed in this research demonstrates several risks regarding environmental, social and economic facets in an organisational supply chain. This framework depicts the interface between triple bottom line matters with risks and disruptive incidents in supply chains and is as presented in Figure 2.3. Furthermore, within the background of this framework, Mangla, Kumar and Barua (2014: 115) provided a description of the method of managing risks in the supply chain as the “capability of an organisational supply chain to recognise, analyse and manage the risks related to its economical, ecological and societal aspects of service delivery”. Figure 2.2 shows the conceptual framework of SCR according to Ho, Zhen, Yilziz and Tulluri (2015: 5034).

Figure 2.2: Conceptual framework of supply chain risks



Source: Ho, Zheng, Yildiz and Tulluri (2015: 5034)

The framework explains that there are micro risks that consist of demand as well as supply; this is the capability of the organisation to keep up with the demand for its goods. SCR can also be classified as *operational* and *disruptive* risks. According to Venkatesh, Rathi and Patwa (2015: 154), operational risks are connected to unforeseen events inherent in a supply chain which comprise demand, supply, and cost uncertainties. Operational risks which are internal to the organisation determine the success rate of the firm in providing an output that sufficiently meets the requirements of the client or customer. In Figure 2.3 the macro risks are man-made or natural; these are normally environmental as well as social risk factors, such as in the case of a natural disaster or public riots that lead to intentional damages to property.

Furthermore, in Figure 2.2 the process of SCR management in the organisation includes the following:

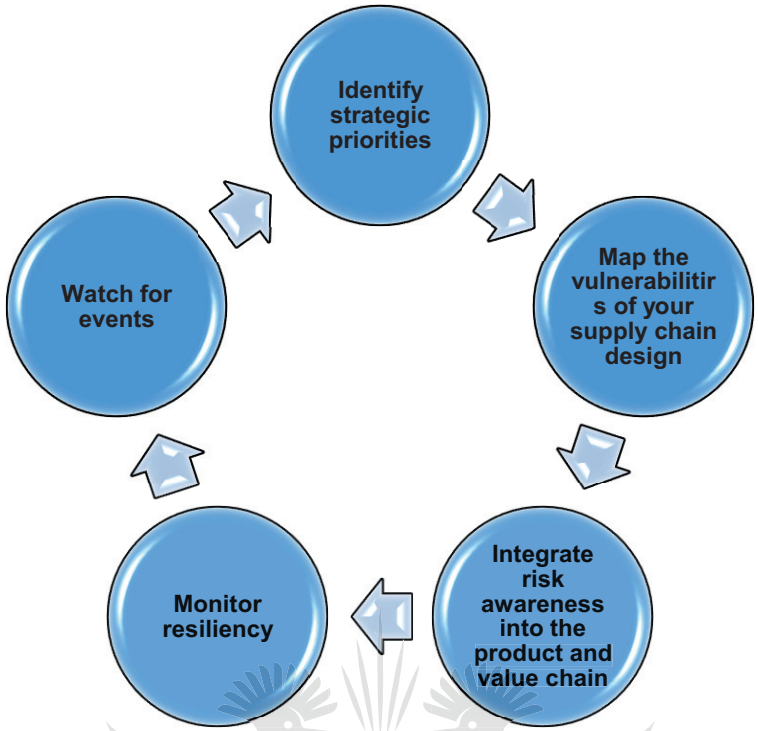
- Step one: Identification
- Step two: Assessment
- Step three: Mitigation.
- Step four: Monitoring.

This process does not illustrate the importance of the organisation integrating the risk process into the supply chain process to ensure that the organisation does not monitor the risk but monitors implementation of mitigation measures. These mitigation measures serve the aim of improving the quality of output to the organisation; it is for this reason that is important to reconfigure the SCM of the organisation.

2.3.1 Reconfiguring Supply Chain Management

According to Sáenz and Revilla (2014: 22), assessment of a company's supply chain is essential to understand the performance of an organisation. Integration of supply chain design and supply chain risk management; as well as balancing proactive mitigation abilities with responsive abilities is necessary to keep the company's supply chain as resilient, efficient and profitable as possible. In essence, smooth management of SCM is used to differentiate companies competitively. This requires the organisation to reconfigure the supply chain as presented in Figure 2.3 from the Cisco case.

Figure 2.3: Reconfiguration of the supply chain adopted from Cisco case



Source: Sáenz and Revilla (2014: 23)

In order to optimise the ability of the firm against SCR factors, the organisation has to reconfigure its supply chain and plan from a risk perspective in addition to planning according to the goals of the organisation. The first step is for the organisation to identify its strategic priorities; whether it is to expand or maintain the organisational output. The ultimate goal is to improve the performance of the organisation, to eventually improve output. Step two involves the mapping of the organisation's vulnerabilities of supply chain design. Step three involves the integration of risk responsiveness into the organisational value chain. Step three requires the organisation to plan from a risk perspective; not monitoring the risk itself but planning to mitigate risks in the supply chain. Step four is the monitoring of resiliency, which involves reflecting on the ability of the organisation to mitigate the risks that it has identified. The final step is to watch for events that Risk Managers may not have been able to foresee. In essence, with the reconfiguration of the supply chain, the organisation is proactively creating a productive environment to ensure effectiveness and efficiency is achieved in the outputs.

2.4 Public sector Risk Management

According to Bessis (2015: 2) *risk* is defined as the "uncertainty that has adverse consequences" on the performance of the organisation. Wolke (2017: 1) defines risk as the "possible damage or potential loss of a net asset position, with no potential gains to offset it". Therefore, risk is an occurrence of an event that may cause irreparable damage to the well-being of the organisation; therefore, mitigation measures are required to avoid or pacify the effect of the risk. Therefore, risk management is the holistic evaluation of the organisation's risk profile with a strategy for mitigation or complete avoidance (Wolke; 2017: 1).

In the South African public sector, *enterprise risk management* is employed, which is described according to Bromiley, McShane, Nair and Rustambekov (2014: 265) as the organisation developing a strategy that identifies risk comprehensively and managing the risks individually; instead of a generic approach. Bromiley, McShane, Nair and Rustambekov (2014: 265) stated that the function of risk management has evolved from a silo-based approach to a more comprehensive approach embedded in the organisational strategy. Furthermore, South African public sector organisations have been found non-compliant to risk management strategies, business continuity and disaster management plans.

In the South African public sector, risk management is mandated by various legislative documents. Section 38 (1) of the Public Finance Management Act indicates that public sector organisations are required to maintain sound financial and risk management. Section 27.2.1 of the Treasury Regulations indicates the Accounting Officers are responsible for regularly assessing risk in the organisation as well as updating a risk strategy. The King IV Report on Corporate Governance of South Africa (2016) Chapter 4, Principle 4.1 states that the relevant governing body needs to define risk and opportunity in a manner that that encourages the organisation in defining the goal of the organisation.

According to Ahmeti and Vladi (2017: 323) risks that are encountered in the public sector are enormous and include more stakeholders than those in the private sector; making the risk more challenging to handle. They further state that the risk is more challenging due to the conflicting interests due to political influence and identified seven key challenges in risk management in the public sector:

- Goals that conflict with other priorities;
- Frequent leadership changes;
- Leadership that lack understanding of risk management;
- Division of the operating budgets from program budgets;

- Cumbersome operational requirements; and
- Lack of risk culture.

According to National Treasury (2004: 9), the Public Finance Management Act mandates the public sector organisations to assess risk in every activity performed. In public sector SCM this entails the accounting officer conducting an assessment on a case basis.

2.5 Public sector Supply Chain Management

Fourie (2015: 38) describes Public Procurement as a process in which products are purchased from service providers in order to achieve the service delivery goals of the public sector. To this effect, Fourie (2015: 38) indicated that Public Procurement operates as a business function of economic activity within a political system.

According to Baharud-din, Shokiyah, and Ibrahim (2014: 126), every year public sector organisations are responsible for collecting and spending hundreds of billions of taxpayers' money. Due to the magnitude of funds collected and to spend, the public sector is required to have in place efficient and effective financial management systems to encourage accountability pertaining to financial management.

The public sector procurement can be employed as a tool to sustainably contribute to economic stimulation. According to Amann, Roehrich, Essig and Harland (2014: 3), given the importance of the public sector supply chain, there lies potential to attain viable social goals across supply chains. Amann et al. (2014: 3) stated that it is important to develop sustainable supply chains that can be measured in terms of performance. However, Fernie and Sparks (2009: 9) stated that if the system is too cost oriented then, it may not meet consumer demands, with potentially dire business consequences. This is because the demand was not achieved, and more costs need to be incurred in order to meet the demand in future. Cost effectiveness is one of the challenges that are faced in the public sector in the supply chain.

The National Treasury (2003: 3) identified two challenges in supply chain management, which are governance and Preferential Procurement Policy Framework Act (2000) implementation. The Contractor Performance Assessment Reporting (CPAR) found these challenges of the South African supply chain and the governance issues relevant to this study include:

Governance issues

- Implementing a sole national legislative framework in terms of Section 76(4) (c) of the Public Finance Management Act (1999).
- Change the obsolete and ineffective procurement and provisioning practices.
- Prescription of minimum norms and standards in procurement process to reduce fragmentation.
- Monitor value for money through performance management.

The pillars of procurement in the South African public sector were illustrated in Figure 1.8. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998: 3) stated that good economic growth is encouraged by good economic institutions; especially those in the public sector. Therefore, the limited direction of the use of the supply chain as an instrument for economic expansion may curtail efficiency.

Public sector processes are guided by legislation to mainly promote accountability and prudent use of public funds where relevant. The South African public sector has numerous legislative prescripts that are meant to ensure credibility and management of processes, especially those with financial implications. Procurement in the public sector is the point at which service delivery is actualised, where public funds are dispensed. This means regulative and legislative prescripts are more entrenched from the Constitution of the Republic of South Africa to ensure accountability.

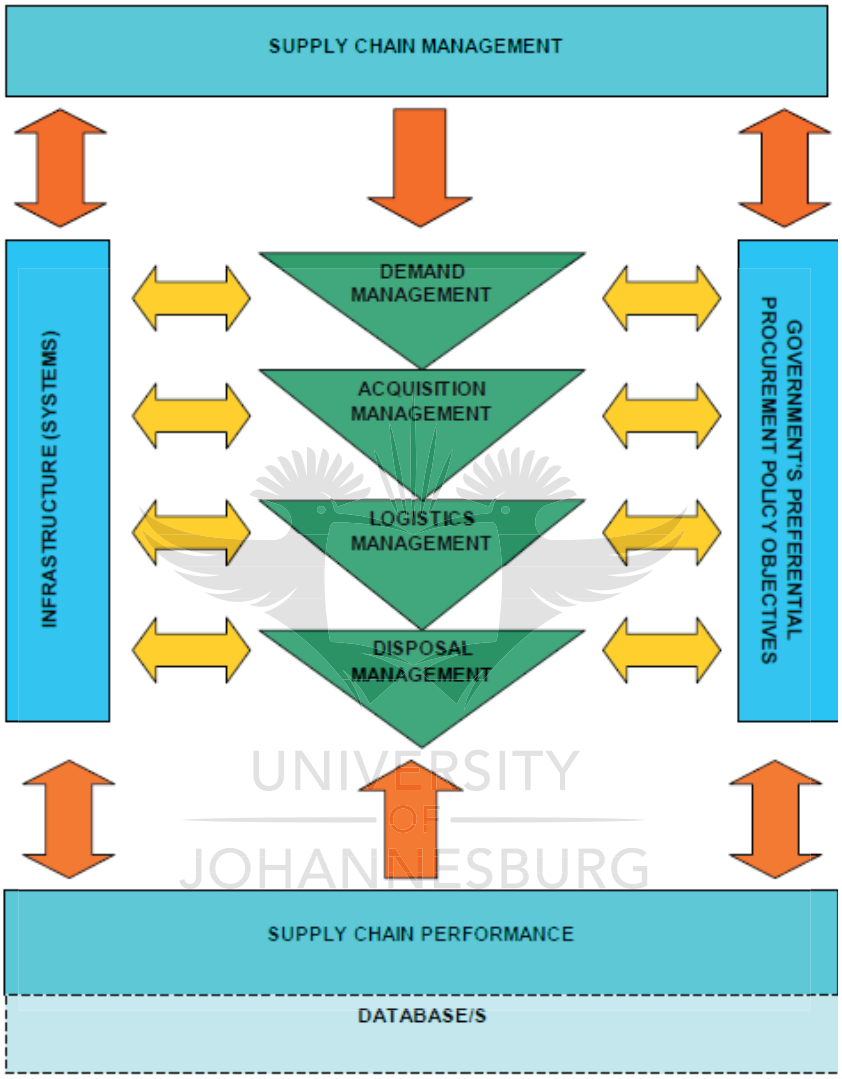
2.5.1 Public sector Supply Chain Management Process

Implementation of the SCM process in the public sector varies to that of the private sector in that 'customer' relationship management is not nurtured. The process begins with demand management, through to acquisition management, logistics management and finally disposal management. Completion of the procedure is followed by a performance evaluation to assess the relevance and efficiency of the project.

Neupane, Soar, and Vaidya (2014: 21) stated that public sector supply chain denotes the process whereby public sector organisations purchase goods and services from service providers. Government acquisition of products usually constitutes 10% to 15% of Gross Domestic Product (GDP) for developed countries and 20% to 70% of GDP in developing countries. Neupane, Soar, and Vaidya (2014: 21) indicated that "governments aspire to use public procurement as a lever of economic, technological or social reform". Figure 2.4

demonstrates the public sector SCM process, which aims to promote the five pillars of procurement. This includes:

Figure 2.4: Public sector Supply Chain Management Process



Source: National Treasury (2003: 20)

Figure 2.4 illustrates the Public Sector Supply Chain Management Process, from demand management through to performance management presented by the National Treasury (2003: 20) in the Policy Strategy to Guide Uniformity in Procurement Reform Processes in Government. Demand management is the first step in the supply chain process. This is a cross-functional activity that allows the supply chain practitioner closer to the client function in the organisation to ensure value for money is achieved. At this point, the specialist business

unit, as well as SCM practitioner, are collaborating to make plans for the project to be implemented.

According to Bizana, Naude and Ambe (2015: 679), at this point the challenges that occur include disintegrated planning, limited capacity resources to investigate the market for fair prices and inadequately developed specifications. Acquisition Management is the second step which aims to resource the departmental plans for effective SCM processes in the public-sector. This involves the determination of the bid evaluation criterion, evaluation of the bids and recommendations. In addition, the contracts would be gathered and signed. Challenges in the acquisition stage consist of a lack of internal controls, unfair SCM practices, supplier's late submission of tenders as well as incomplete documentation, vague specifications, unfair awarding of contracts and cover-quoting. The third step includes logistics management where the stock is counted and classified in order to include the stock in the financial system to generate payments to service providers. The classification process includes; coding of items, setting of inventory levels, placing of orders, receiving and distribution of material; stores/warehouse management, expediting orders, transportation and vendor performance. The fourth step in the process is disposal management which requires the procurement practitioner to conduct obsolescence planning or depreciation rates per item and determine how the items are to be disposed of.

The final step is performance management, where the monitoring process occurs; through a reflective analysis of the process. It is to basically measure the ability of the project to meet the initial planned outcome; however, in the public sector emphasis is placed on accountability. This means that compliance with norms and standards need to be met along with achieving the planned outcome (Policy Strategy to Guide Uniformity in Procurement Reform Processes in Government; 2003: 20). Bizana, Naude and Amber (2015: 679) stated that in the contract management stage challenges such as supplier's late deliveries, under-quoting, incompetent service providers, lack of skills and capacity as well as weak internal controls. The implementation of the SCM process is marred by various challenges; particularly, disintegration in the planning processes, unfair practices and limited or lack of skills of SCM practitioners.

2.5.1.1 Risk in the Public Sector Supply Chain Management Process

According to the National Treasury (2004: 13) there are various risks associated with the SCM process in the public sector. Furthermore, there is a lack of generic contract documentation, which creates fragmentation in various organisations across the public sector (National

Treasury; 2004: 13). Furthermore, the risk associated with capacity building of SCM officials is prevalent in the implementation of SCM implementation (National Treasury; 2004: 21). Fragmentation in the implementation of SCM may lead to bids rejected due only due to the purpose of obtaining lower prices (National Treasury; 2004: 45).

The National Treasury (2004: 38) indicated the fluctuation of currencies is also a risk that the public sector encounters; however, this should be shifted to the supplier. SCM practitioners are required to assess possible risks associated with the availability of adequate facilities, financial position, capacity and performance history of the supplier (National Treasury; 2004: 46). However, due to the fragmented nature of SCM in the public sector that is also influenced by the lack of capacity building, risk to SCM implementation is high. In addition to the SCM process, SCM is governed by an extensive legislative framework.

2.6 The legislative framework for Supply Chain in South African Public Sector

A legislative framework serves the purpose of not only providing transparency for the implementation of SC in the public sector, but it also serves as a means of providing guidance for the accurate implementation of all processes to ensure compliance as well as value for money.

- **The Constitution of the Republic of South Africa (1996)**

The bases of procurement are in Section 217 (1) of the Constitution of the Republic of South Africa (1996: 112) which stated that an organ of state or any other institution identified in national legislation; when contracting a service provider must do so with a system which is fair, equitable, transparent, competitive and cost-effective.

- **The Public Finance Management Act (1999)**

The Public Finance Management Act (1999: 1) aims to standardize financial management in national and provincial governments by ensuring that the effective spending of public money. Section 38 of the Public Finance Management Act (1999: 36) requires that an appropriate procurement and provisioning system is “fair, equitable, transparent, competitive and cost-effective”.

- **National Treasury Regulations**

The National Treasury Regulations serves as being a guideline to the implementation of the Public Finance Management Act (1999). The Treasury Regulations requires departments to have a supply chain management system that must be fair, equitable, transparent, competitive and cost effective; and consistent with the Preferential Procurement Policy Framework Act 5 (2000) and Broad Based Black Economic Empowerment Act 53 (2003). In addition, the National Treasury Regulations must provide for at least the following:

- Demand management;
- Acquisition management;
- Logistics management;
- Disposal management;
- Risk management; and
- Regular assessment of supply chain performance.

The Treasury Regulations is detailed about the required functions within the supply chain function to ensure the five pillars of procurement are achieved.

- **King IV Report on Corporate Governance for South Africa (2016)**

The main purpose of the of the King IV Report on Corporate Governance for South Africa (2016: 21) is to promote ethical corporate governance across private and public sectors. The objectives of the King IV Report on Corporate Governance for South Africa (2016: 22) are to promote governance, increase acceptance of the Report, reinforce corporate governance as an integrated process, promote transparency through reporting to stakeholders and ethical consciousness in corporate governance.

- **Prevention and Combating of Corrupt Activities Act 12 of 2004**

The main purpose of the Prevention and Combating of Corrupt Activities Act 12 of 2004 is to deliver corruption prevention procedures as well as terminate corrupt activities. The procedures include investigative measures, the endorsement of a Register of Offenders. The Register of Offenders Compromises of measures that hold respective officials accountable for reporting such activities relating to procurement.

- **Construction Industry Development Board Act 38 of 2000**

To provide for the establishment of the Construction Industry Development Board; to implement an integrated strategy for the reconstruction, growth and development of the construction industry. The purpose of the Act is to develop effective SCM processes that will promote the effectiveness of the construction industry between the public and private sectors.

- **Competition Act 89 of 1998**

The Competition Act 89 of 1998 was developed to legislate the establishment of the Competition Commission that is tasked with the "investigation, control and evaluation of restrictive practices" in the national economy. The Competition Act 89 of 1998 sites the discriminatory laws and practices of the past as the premise of the establishment of the Act. The restrictive laws that prevented the national economy from operating equitably and fairly to all South Africans. Therefore, the Competition Act 89 of 1998 aims to ensure that all South Africans have equal opportunity to fairly compete in the national economy.

- **Preferential Procurement Policy Framework Act (2000)**

The Preferential Procurement Policy Framework Act 97 (2000: 1) aims to give effect to section 217(3) of the Constitution of the Republic of South Africa (1996: 112) by providing a structure for the execution of the procurement policy contemplated in Section 217(2) of the Constitution of the Republic of South Africa.

- **Broad-Based Black Economic Empowerment Act (2003)**

The Broad-Based Black Economic Empowerment Act (B-BBEE) (2003: 2) aims to establish a legislative framework for the promotion of black economic empowerment. The B-BBEE essentially uses procurement as a tool to redress the racial injustices of the past have left many economically disadvantaged. However, the legislation referred to above does not provide guidance on the implementation of consequence management. This may assist as a mitigating measure to public sector risk factors and in effect improve its occurrence. According to the Auditor-General (2017: 112), public sector organisations with poor consequence

management practices are often prone to corruption or fraud, as a result of officials not being held accountable.

2.6.1 Risk associated with Supply Chain Management legislative framework

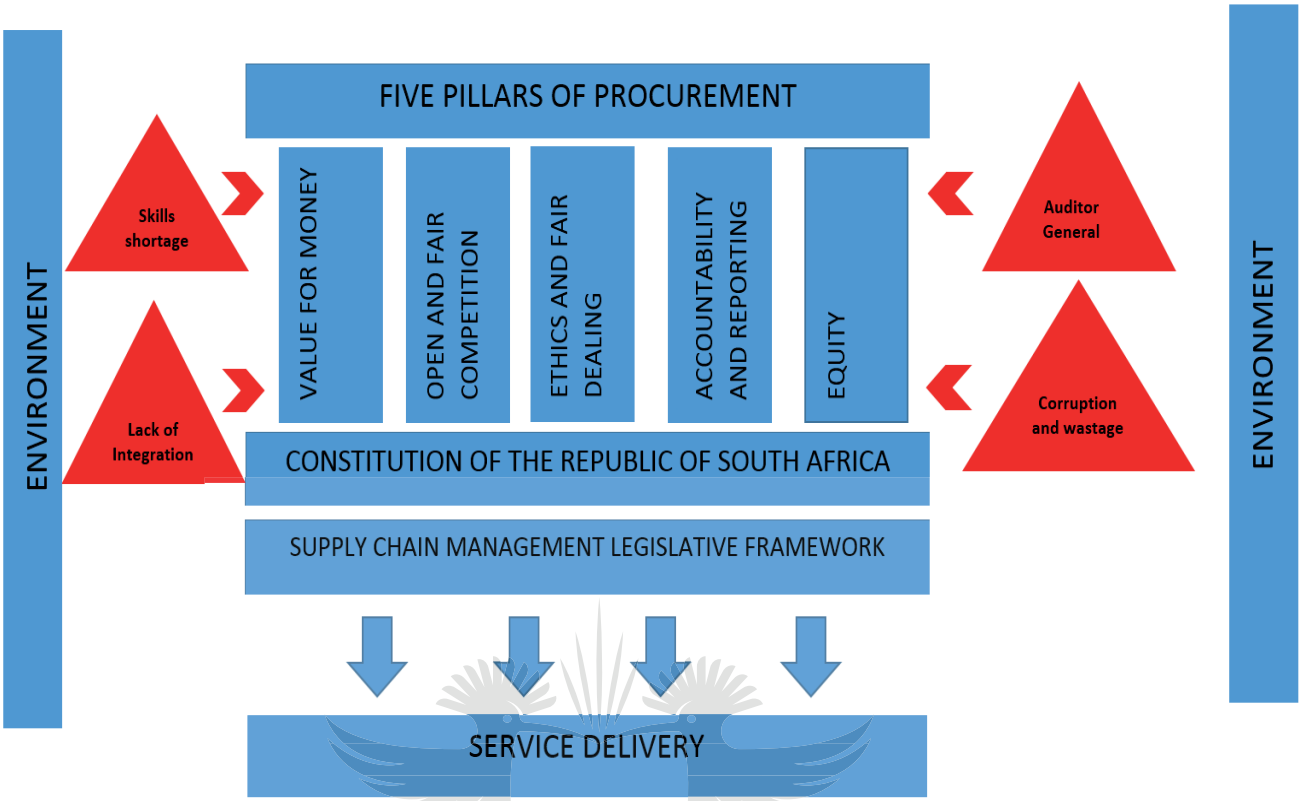
The Constitution of the Republic of South Africa (1996), Public Finance Management Act (1999), National Treasury Regulations lay down the value framework for the fair, equitable and transparent implementation of SCM in the South African public sector. The legislative framework is extended through the King Report on Corporate Governance for South Africa (2016) which aims to promote good corporate governance in the private and public sectors. Furthermore, the Prevention and Combating of Corrupt Activities Act 12 of 2004, aims to establish measures that prevent unfair corrupt activities in public sector SCM. The Construction Industry Development Board Act 38 of 2000 through the establishment of various structures aims to promote efficiency of SCM in the construction industry. In addition, the Competition Act 89 of 1998 which tasked to encourage a competitive economic environment.

However, the Preferential Procurement Policy Framework Act (2000) and Broad-Based Black Economic Empowerment Act (2003) institute a racial preferential framework to encourage economic equality. According to Magoro and Brynard (2010: 9) the intention of the policies was to provide the previously disadvantaged a competitive edge. However, Magoro and Brynard (2010: 9) argued that preferential procurement policy has contradictions mainly based on its conflicting principles to the Constitution of the Republic of South Africa (1996).

2.7 Public sector Supply Chain Risks

When the supply chain is adapted to a public sector environment, it is governed by a strong legislative framework that guides the assurance of accountability of public funds. Without key legislation the risk factors already experienced would be magnified. However, despite these efforts, these risk factors remain the main cause of loopholes in the system. Figure 2.5 shows the public sector supply chain management framework and risk factors associated with its implementation.

Figure 2.5: Public sector supply chain risks



Source: Authors own diagram

The five pillars of procurement aim to implement an SCM that is efficient, effective and economical. The attainment of value for money implies products meet the required standard while procured at an affordable cost. The achievement of open and fair competition enables an environment where suppliers operate without unfair preference. In order to eliminate the presence of fraud and corruption, there should be ethical and fair dealing. Accountability and reporting enable transparency and openness to the public to the use of public finance. The presence of equity also ensures SCM processes enable fair competition amongst its suppliers.

The five values are entrenched in Section 217(1) of the Constitution of the Republic of South Africa as well as other SCM legislation. The various guidelines and principles envisioning procurement practices that enable quality service delivery are provided. However, the challenges lie in the risk factors presented in the internal public sector environment-. The risk factors include the following:

- Shortage of SCM skills;
- Decentralisation;

- Authority of the AG; and
- Corruption and wastage.

The risks are internal to the public sector as an institution, in national, provincial and local governments; however, this study only assessed provincial government and Gauteng Provincial Treasury to be precise. If these capabilities are enabled, SCM will be efficient and effective in delivering services that meet the required standard as well as targets.

2.7.1 Shortage of Supply Chain Management Skills

According to South African Institute of Chartered Accountants (2008: 24) the concept of "skills shortage" refers to a condition where few professionals are available in the local labour market to fill the relevant existing jobs available. Skills are also inclusive of the level of experience that a candidate possesses which may determine job performance. Bhargava and Anbazhagan (2014: 105) affirmed that there is a correlation between job experience and job performance. It is to this end that Brooks (2016: 49) stated that the "fundamental problem experienced in South Africa's decentralised system is a lack of trained procurement practitioners". The lack of skill does not entirely imply personnel do not possess qualifications. However, according to Quintini (2011: 23), there could be a skill mismatch in the organisation that is caused by the change in the economy, which requires employees to augment current skills to the relevant standard to meet demands in the market. Challenges in the SCM value chain are magnified by the challenges of the lack of skilled labourers in the SCM industry.

In the Capacity Development Strategy, the National Treasury (2017: 4) divides Public Finance Management (PFM) into nine components that are functions in every public sector organisation. The nine components include management accounting (planning and budgeting), revenue management, expenditure management, asset management (movable and immovable), financial accounting, supply chain management, internal control, enterprise risk management and internal audit. According to the National Treasury (2017: 5), the PFM environment experiences skills shortages, with vacancy rates as high as 34%, coupled with turnover rates of 14.6 months. This is even more of a challenge for SCM as it is the point at which service delivery is dispensed, as the lack of skills in the function may increase inefficiencies and corrupt activities.

In 2004, National Treasury issued a Practice Note on the training of SCM officials in all public sector institutions. National Treasury recommended training in the following areas:

- Introduction to SCM;

- Intermediate training with the attention on concentrated training on all elements of SCM; and
- Advanced training that includes specialist skills within each element of the SCM process such as strategic sourcing.

Additionally, those earmarked for this training included officials in the following categories within SCM:

- Senior Management;
- Practitioners who are involved with the routine operations of SCM (senior and operational); and
- New entrants - new appointees irrespective of the level at which they are appointed.

In the Capacity Development Strategy (CDS) National Treasury (2017: 4) categorised PFM into nine disciplines:

- Management Accounting (planning and budgeting);
- Revenue Management;
- Expenditure Management;
- Asset Management (movable and immovable);
- Financial Accounting;
- Supply Chain Management;
- Internal Control;
- Enterprise Risk Management; and
- Internal Audit.

Public sector SCM is one of the functions that are suffering the effects of skills shortage. This may be the reason for challenges experienced within public sector procurement. A study conducted by the National Treasury (2016: 4) found that public sector SCM officials have been operating for many years without appropriate SCM-related academic qualifications and relevant training. This contributes to the weakened SCM operations in the South African public-sector.

The Capacity Development Strategy (CDS) that was approved by the then Minister of Finance in 2012 provides a national outlook to address financial management capacity limitations in

the public-sector. These challenges identified in the Capacity Development Strategy (CDS) National Treasury (2017a: 4) include:

- Scarce skills;
- High levels of vacancies and staff turnover;
- Lack of suitable education, training and development programmes;
- Limited knowledge management;
- Inadequate monitoring and evaluation;
- Ineffective performance management;
- Non-adherence to legislation;
- Poor audit results; and
- An absence of effective partnerships.

Positions that have not been filled have left the functions less capacitated as it would have been with all the vacancies filled, as shown in Table 2.1.

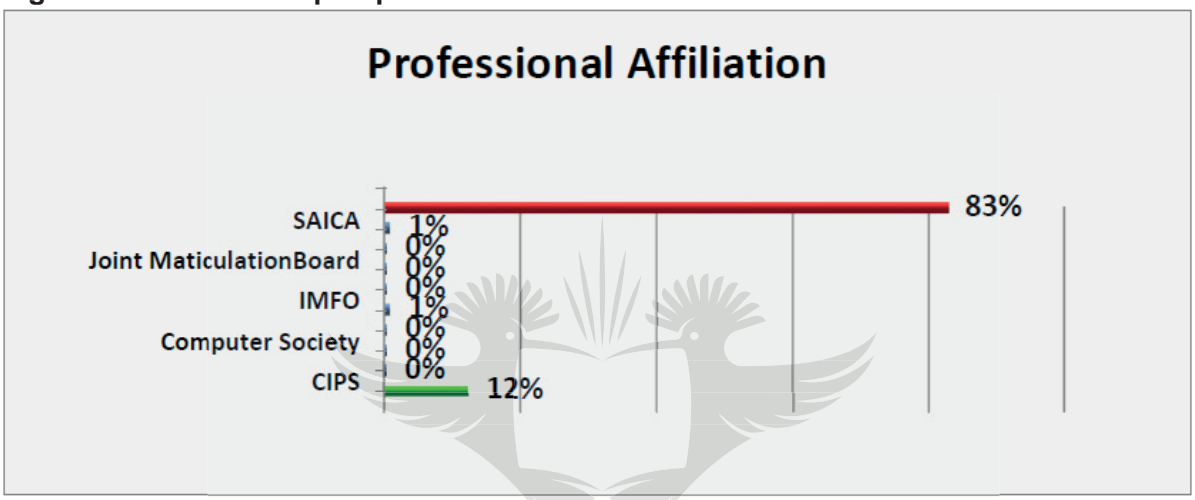
Table 2.1: Vacancies as a percentage of approved, funded positions in national and provincial treasuries

Supply Chain Management Support in National and Provincial Treasuries (PT) Units				
Filled Posts and Vacancies				
Description	**Approved funded posts**	**Filled positions**	**Vacancies**	**As % of approved funded positions**
National Treasury	87	68	19	22%
Limpopo Treasury	62	41	21	34%
KwaZulu-Natal PT	47	40	7	15%
Northwest PT	43	29	14	33%
Mpumalanga PT	36	27	9	25%
Eastern Cape PT	30	24	6	20%
Gauteng PT	21	21	0	0%
Northern Cape PT	23	5	18	78%
Western Cape PT	17	11	6	35%
Free state PT	8	6	2	25%
Total	**374**	**272**	**102**	**27%**

Source: National Treasury (2016d: 9)

Table 2.1 shows the SCM vacancies as a percentage of approved positions, with the highest vacancies being recorded in Northern Cape. GPT has no vacancies, which is good in terms of compliance with legislation. However, this does not mean that the personnel filling the posts have the relevant skills and qualifications to be able to operate effectively. Figure 2.6 shows the membership of professional bodies in the Provincial Treasuries which include South African Institute of Accountants (SAICA), Joint Matriculation Board, Chartered Institute of Government Finance, Audit and Risk Officers (CIGFARO/IMFO), Chartered Institute of Procurement and Supply (CIPS).

Figure 2.6: Membership of professional bodies



Source: National Treasury (2016d: 15)

The professional organisation relevant to public sector SCM is CIPS; however, most officials are affiliated to SAICA that is a professional accountant body. Professional body affiliation is essential as the Chartered Institute of Building (2015: 1) indicated that professional affiliation provides value to society, which includes productivity, social mobility, governance and ethics, international development and policy formation. Furthermore, Patel (2014: 8) stated that professional bodies aim to offer qualifications, set conditions for maintaining competence as well as to maintain and enforce the code of conduct. These are all important factors that maintain competency and, therefore an effective organisation. The completed qualifications are also mismatched, as most officials in SCM do not hold a qualification in SCM or logistics management as shown in Table 2.2.

Table 2.2: Completed qualification of officials in provincial treasuries

Description	Total in %	Total in value
Accounting	16%	35
Auditing	2%	5
BBBEE Programme	0%	1
Business Administration	7%	16
Business Management	2%	5
Economics	5%	11
Education	0%	1
Human Resource	2%	5
Information Technology	2%	4
Law	1%	3
Logistics	2%	4
Other	4%	8
Public Management	8%	17
Public Administration	7%	16
Public Policy	0%	1
Public Relations	2%	5
Purchasing Management	2%	5
Risk Management	0%	1
SCM	2%	4
Secretarial	1%	3
Social Science	1%	2
Strategic SCM	1%	3
Taxation	0%	1
Unknown	11%	24
Not Applicable	17%	37
Total	**100%**	**217**

Source: National Treasury (2016d: 16)

Table 2.2 shows a description of the completed qualification of officials in SCM in Provincial Treasuries. Respondents had either responded that the qualification did not apply or was unknown to them or those qualifications were acquired in accounting. This is followed by Public Management and Administration as well as Business Management and Economics. Logistics and Purchasing Management are the two qualifications that are relevant to the function of SCM in the public sector, however, only a percentage of 2% was recorded for each respectively. This is in accordance with a study conducted by the National Treasury (2016d:

22) investigating challenges in SCM in Provincial Treasuries. One of the findings was that there was a lack of willingness by officials to pursue specialised studies in SCM. National Treasury (2016d: 22) emphasises the importance of expert knowledge and skills to ensure compliance with the public sector SCM framework in order to avoid unfavourable audit opinions. There may be officials in the Provincial Treasuries that are willing to pursue specialised studies in public sector SCM as indicated in Table 2.3.

Table 2.3: Interest in undertaking formal education by provincial treasury officials

Description	Total in %	Total in value
Public Administration	5%	10
Accounting	5%	10
Auditing	1%	2
Business Administration	4%	8
Economics	1%	3
Human Resource	0%	1
Information Technology	0%	1
Law	4%	8
Logistics	0%	0
Marketing	1%	2
Not Applicable	53%	115
Other	3%	7
Procurement Management	0%	1
Project Management	1%	3
Public Management	2%	5
Purchasing Management	0%	1
Risk Management	1%	2
SCM	8%	17
Strategic SCM	0%	1
Unknown	9%	20
Total	**100%**	**217**

Source: Source: National Treasury (2016d: 9)

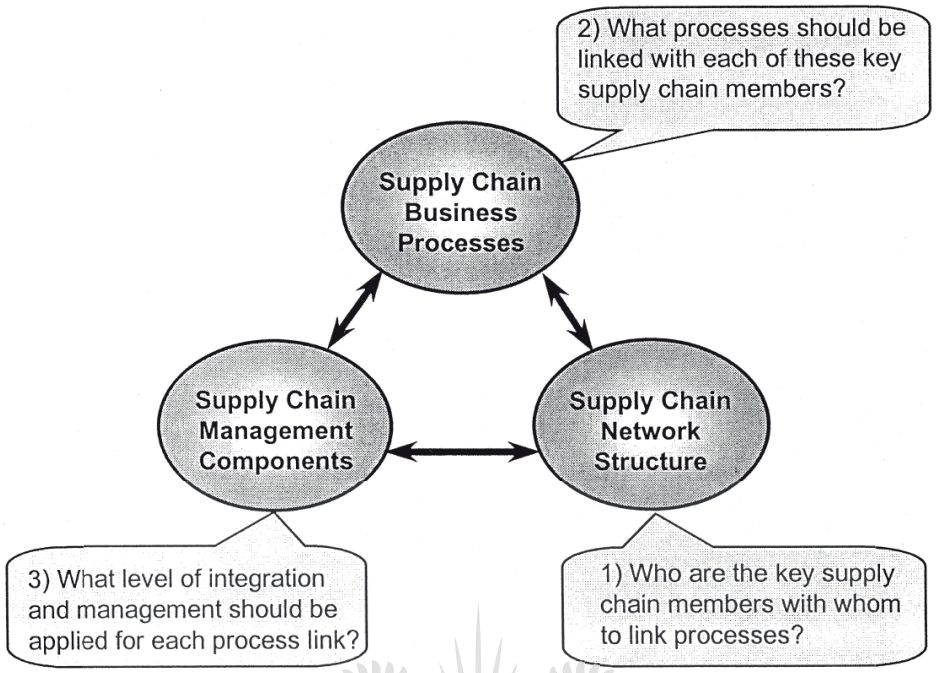
Table 2.3 shows that most of the respondents at Provincial Treasuries were not interested in studying towards the qualifications listed in the table. This is followed by those with an unknown response, leaving 8% of the respondents planning to pursue studies in SCM, followed by Public Administration and Accounting with 5 percent respectively.

2.6.2 Decentralised Supply Chain Management

The Organisation of Economic Co-operation and Development (OECD) (2000: 4) stated that a decentralised public procurement system is an approach that places responsibility for the relevant accounting officer. Decentralisation is done with the intention of improving economic efficiency by placing the function closer to the end-user and therefore reducing the error of purchasing goods and services that may not meet the needs of the public. The South African SCM system is decentralised in nature, allowing points of service to purchase goods and services efficiently. In a media statement, the National Treasury (2016b: 1) has taken into cognisance the decentralised nature of support functions such as Supply Chain Management; Human Resource Management; Financial Management; Payroll and Business Intelligence. The National Treasury (2016b: 1) is endeavouring to improve this disintegration through the Integrated Financial Management System (IFMS).

Disintegrated public sector SCM systems are based on outdated technology and a non-synchronised approach, leading to errors with the implementation of procurement. The decentralisation of SCM into fragments has created loopholes that can be omitted with elements of a centralised system. Lambert and Cooper (2000: 71) stated that an effective supply chain needs a transformation from managing individual functions to centralised operations into vital supply chain processes. It is therefore about constructing and maintaining a network of relationships with the actual business units in the company as well as outside the company. This is alternative to the norm of SCM only being contracted for support purposes, without centralising planning processes of the organisation into supply chain processes. Figure 2.7 depicts the centralised SCM framework.

Figure 2.7: Centralised Supply Chain Management Framework



Source: Lambert and Cooper (2000: 70)

The centralised SCM Framework presented in Figure 2 7 illustrates how the business process applies to the SCM framework as it is a basic building block along with SCM components as well as supply chain network structures. The SCM framework depicts the centralised network that is a requisite of an effective supply chain. According to Lambert and Cooper (2000: 70), it is crucial to ask various questions relating to the SCM framework. Firstly, it is important to ask which business processes should be connected. Secondly, identification of the key stakeholders of the supply chain network is essential. Finally, the level of centralisation, as well as management, should be applied for each process. This enables supply chain to become more efficient as well as strategic in the organisation achieving goals. This means that supply chain process should not be a uniform method. Every organisation needs a balance between the focus of supply and demand in the supply chain value chain. This will determine whether the organisation is centralised or decentralised. The link between the supply chain process and value can be found through the assessment of supply and demand in the supply chain as indicated in Table 2.4.

Table 2.4: Supply and demand chain

Supply Chain (process focused)	Demand Chain (value add focused)
Efficiency focus; cost per item	Effectiveness focus; customer-focused product-market fit
Processes are focused on execution	Processes are focused more on planning and delivering value
Cost is the key driver	Cash flow and profitability are the key drivers
Short-term oriented, within the immediate and controllable future	Long-term oriented, within the next planning cycles
Typically, the domain of tactical manufacturing and logistics personnel	Typically, the domain of marketing, sales and strategic operations managers
Focuses on immediate resource and capacity constraints	Focuses on long-term capabilities, not short-term constraints
Historical focus on operations planning and controls	Historical focus on demand and supply alignment

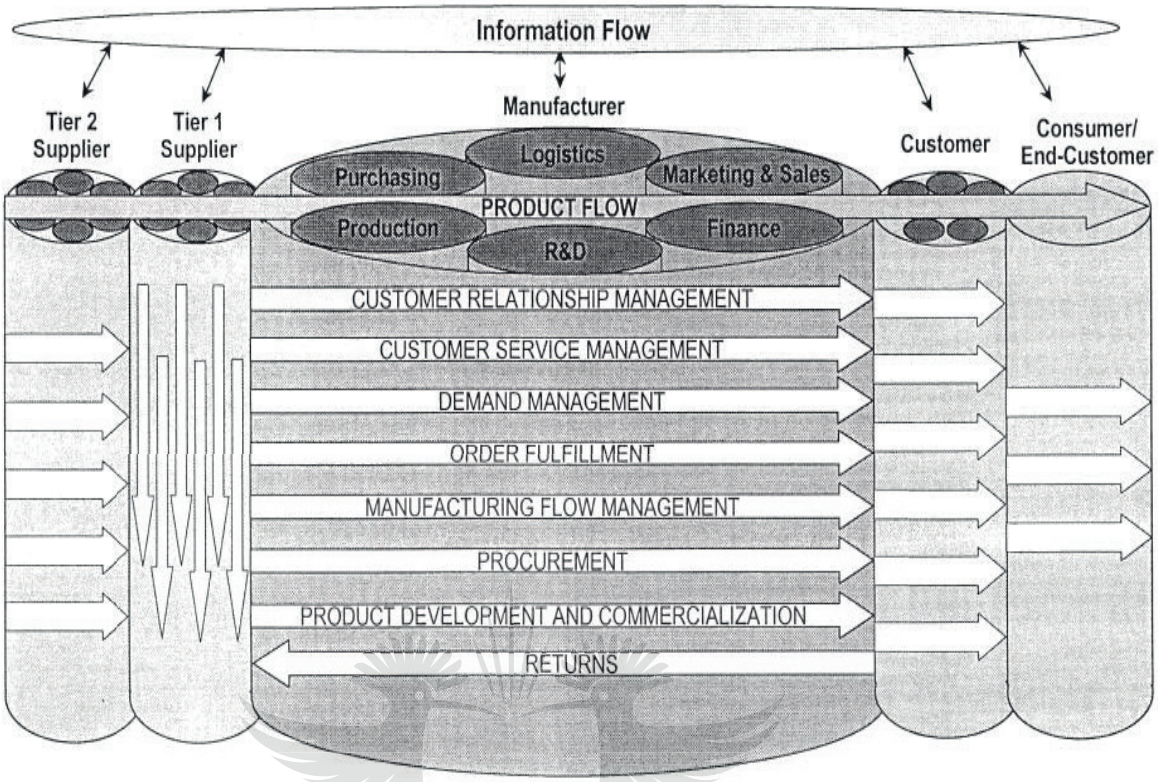
Fernie and Sparks (2009: 19)

Table 2.4 shows that there are differences between supply and demand chain processes as well as methods. According to Fernie and Sparks (2009: 19), companies need to reach a balance between cost efficiency and meeting the needs of the consumer. Organisations should avoid reducing cost at the expense of meeting consumer quality demands. Fernie and Sparks (2009: 19) suggested that for a successful approach, the firm should consider a combination of demand and supply chains to create a balance that does not compromise quality demand. Centralisation and decentralisation should essentially be adapted to the needs of the organisation.

2.6.3.1 Centralised Supply Chain Management Process

For the supply chain to operate optimally, the process is required to be integrated to ensure collaboration between functions of the organisation. When all aspects of the value chain respond to the needs of the other, more value can be realised as well as the achievement of the objectives of the organisation. Figure 2.8 illustrates a centralised SCM approach that caters to relationship management needs of the organisation that had been neglected by logistics management within the organisation.

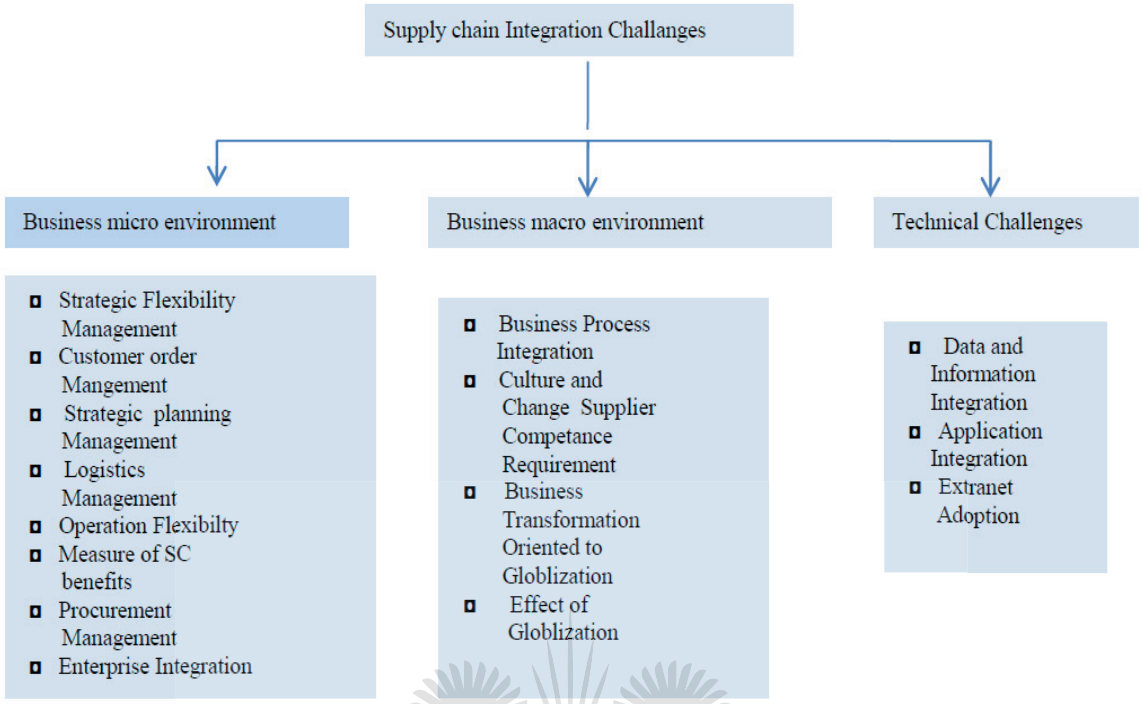
Figure 2.8: Centralised Supply Chain Management business process: integrating and managing business processes across the supply chain



Source: Lambert and Cooper (2000: 67)

The centralised supply chain process operates within a framework that ensures the mitigation of disruptions that may occur due to the constant presence of risk. It is important to ensure that relationships and service with customers are managed. This is due to the strategic oversight that a centralised system enables. In as much as the centralised framework has advantages, it also poses disadvantages as indicated in Figure 2.9.

Figure 2.9: SCM integration challenges



Source: (Bala; 2014: 949)

In the micro environment, the challenge that lies in the integration of SCM processes is the ability of the activities of the organisation to adapt to the modifications in the external environment. The business environment is constantly changing and requires the organisation to adapt to these changes; especially with regards to SCM processes. The technical challenges are linked to data and application centralisation as well as extranet adoption.

In 2013, the National Treasury established the Office of the Chief Procurement Officer (OCPO) with the purpose of providing an oversight role to procurement in the public sector reforms. According to Ambe (2016: 288), the OCPO was tasked with modernising and overseeing public sector SCM systems to ensure practices are fair, equitable, transparent, competitive and cost effective. The Office aims to centralise several public sector transversal goods and services which include the following:

- Centralise banking services for 660 government entities;
- ICT infrastructure and services that cost the public sector R10-billion a year;
- The cost of consultants is at R12-billion a year;
- Security services cost R3.5-billion annually with a lack of uniformity in the services;
- Air travel and hotel accommodation account R5-billion annually;

- The school textbooks and stationery field can be sourced more cost effectively;
- The OCPO is conducting research to find opportunities in the health care equipment industry;
- Leasing and accommodation needs to be consolidated through the State Property Management Agency; and
- Telecommunications services cost government R2.4-billion annually, while it spends R800-million on mobile services (Ambe; 2016: 288).

Procuring such goods and services through transversal contracts holds great benefits. It also opens up many shortfalls as well as wastage of public funds as indicated in Table 1.1. Corruption Watch (2017: 19) stated that the OCPO is also mandated to remove unnecessary steps in the SCM processes and develop it into a strategic rather than an administrative function. Part of the implementation of centralisation is through the Central Supplier Database (CSD).

According to the National Treasury (2018b:1), the purpose of the CSD is to sustain a database of organisations, institutions and individuals who can provide goods and services to the government. The National Treasury aims that the CSD will serve as the single source of key supplier information for the public sector providing consolidated and accurate supplier information to procuring public entities (National Treasury; 2018b: 1). This is done in the effort to improve the credibility of information of suppliers doing business with the public sector. This shows the efforts that the National Treasury is investing in order to centralise some functions of the supply chain in the public sector.

2.6.3 Authority of Auditor-General in Supply Chain Management

The role of the Auditor General South Africa is instrumental for the health of public sector procurement. According to Fourie (2015: 42), the role of the AGSA is to conduct assessment audits in the public sector SCM that ensure that it is fair, equitable, transparent, competitive and cost effective.

Spekle and Verbeeten (2014: 131) stated that, in order to promote an effective, efficient, and accountable public sector, New Public Management (NPM) needs to be assumed in order to encourage mechanistic performance contracting. In the South African Public Sector, the AGSA is one such organisation that is used to ensure that officials perform in line with departmental objectives as well as to promote accountability. Yee, Sujan, James and Leung

(2008: 155) stated that Internal Auditing (IA) can help the organisation improve inefficiencies for resources to be invested in value adding projects, more especially external auditing.

With external auditing, public sector organisations are able to measure performance against organisational objectives. Rendon and Rendon (2015: 723) explained that public procurement not only needs to ensure contracts achieve organisational objectives; but also, realise value for money. In addition, these contracts are required to be executed with accountability and transparency. Therefore, as Rendon and Rendon (2015: 723) stated, entities require competent personnel, capable procurement processes, and effective internal controls.

Baharud-din, Shokiyah, and Ibrahim (2014: 126) stated that the public sector is aware that the quality of financial management will lead to the success of service delivery. The quality of public sector financial management determines quality spending; therefore, proper SCM practices are a requirement for effective public sector service delivery. In South Africa, the Office of the Auditor General is established for evaluating the public sector against service delivery plans. This is to ensure not only service delivery but also the required standards are achieved.

The office of the Auditor General is a national regulator established according to the Public Audit Act 25 of 2004 which aims to realise provisions of the Constitution of the Republic of South Africa. According to the Public Audit Act of 2004, the Auditor General is to provide for the auditing of institutions in the public sector and to provide for accountability arrangements of the Auditor General. The Parliament of South Africa has led a debate regarding the role and power of the Auditor General, of which the role and powers are stipulated in the Public Audit Act of 2004. According to the Parliamentary Monitoring Group (PMG) (2018: 1), the Public Audit Amendment Bill of 2017 proposes giving the Auditor General the power to recover losses from responsible persons. The process indicates the importance of strengthening the authority of the Auditor General as this poses a risk to government departments adhering to audit recommendations.

According to Section 188 of the Constitution of the Republic of South Africa (1996: 95), the Auditor General is responsible for the audit and report on the accounts, financial statements and financial management of all public sector organisations and public entities. In addition to the duties prescribed above, the AG may audit and report on the accounts, financial statements and financial management of any institution funded from the fiscus. Furthermore, Section 188 of the Constitution of the Republic of South Africa (1996: 95) states the Auditor-General must submit audit reports to any legislature that has a direct interest in the audit, and

to any other authority prescribed by national legislation; all the audit reports must be made public.

Kleinman, Lin and Palmon (2014: 77) stated that issues of national prestige and reputation, as well as institutional pride, are monitored through mechanisms such as audit reports. In addition, Kleinman et al. (2014: 77) stated that the reputation based on the performance of the organisation as evaluated by the national regulation would affect co-operation with the organisation. In South Africa, the credibility of external auditors has been questioned, just as in the case of audit firms Klynveld Peat Marwick Goerdeler (KPMG) and Nkonki Inc. The credibility of these two firms resulted in the Auditor General terminating services from the firms due to governance issues raised against them (Auditor-General South Africa; 2018: 1). The role of an auditor is to ensure the overall health of institutions, financial and ethical. However, if an audit firm cannot assure credibility, it also cannot provide a true reflection of the state of the organisation. This leads to questioning of the authority of the Auditor General of South Africa in general.

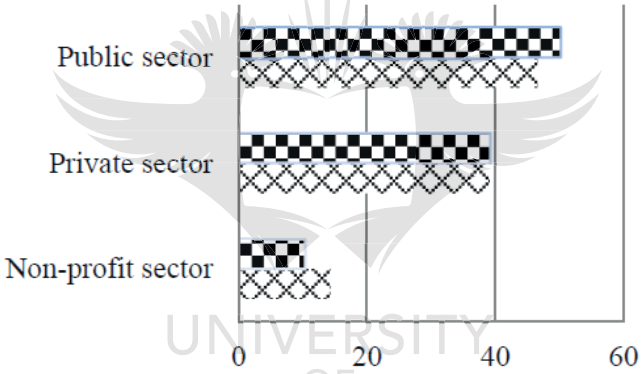
2.6.4 Fraud and corruption in procurement

According to Mantzaris (2014: 76), the procurement process requires more management due to the prevalence of fraud and corruption. Fourie (2015: 38) reflected on the fact that there is an extensive legislative guideline to ethical public procurement practices despite the increase in corruption and fraud. Akenbor and Ironkwe (2014: 451) stated that fraudulent activities have been haemorrhaging the entire economy, particularly the public sector due to the high-risk factors associated with fraud in the private sector. Prabowo (2014: 306) indicated that in 2012 a global study by the Association of Certified Fraud Examiners was conducted and estimated annual losses from fraud worldwide are estimated to be US$3.5-trillion. Fourie (2015: 40) stated that in South Africa an estimated R30-billion was lost due to corruption in the procurement of goods and services in the construction industry. According to National Treasury (2018a: 4), the government spent R27-billion in 2016/17 on buildings and other fixed structures; this shows the magnitude of funds allocated for capital spending in the public sector.

Furthermore, Neupanm, Soar and Vaidya (2015: 356) stated: “corruption in public procurement is believed to be rapidly increasing, especially in developing countries”. Neupanm, Soar and Vaidya (2015: 356) stated that public procurement accounts for almost 10% to 15% of GDP in developed countries and almost 20% of GDP in developing countries.

Rendon and Rendon (2015: 714) found that, in the case of procurement corruption, there was an indication of disregard for procurement processes in contract awarding, high procurement expenditure yet low service-delivery, and a misuse of public funds. With the government public procurement being "big business" according to National Treasury (2018a: 1), spending in excess of R938-billion a year in goods and services, procurement is a function that requires effective operations. In addition, Fourie (2015: 40) showed that corruption inhibits "the ability of the public sector to achieve its agenda; affects spending on priority sectors such as education and health and can have a damaging impact on growth". The scale of fraud is illustrated by the percentage of global fraud by the public, private and non-profit sectors in Figure 2.10.

Figure 2.10: Global fraud by public, private and non-profit sectors in percentage from 2008-2012

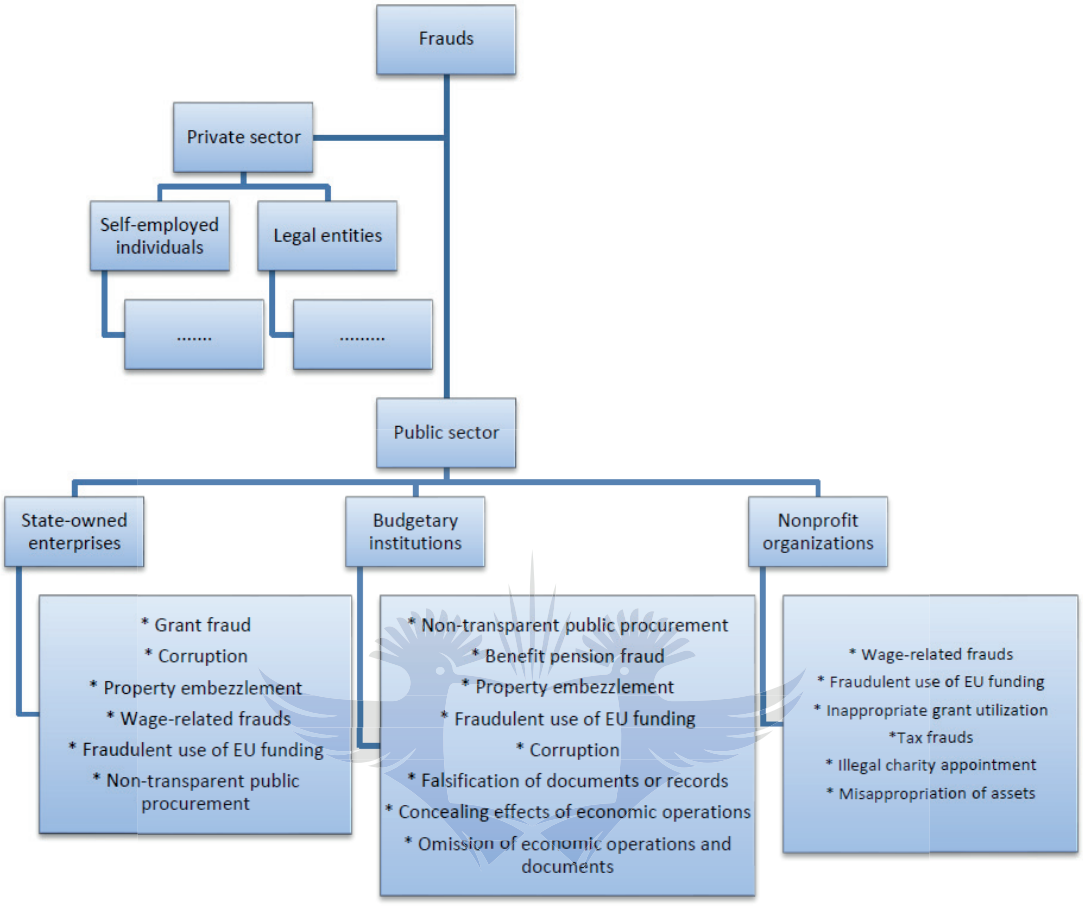


	Non-profit sector	Private sector	Public sector
2012	10,4	39,3	50,3
2008	14,3	39,1	46,6

Source: Giriunas and Mackevicius (2014: 143)

Giriunas and Mackevicius (2014: 143) showed the proportion of fraudulent activities committed in the public sector is higher than in the private sector. According to Giriunas and Mackevicius (2014: 145), entities committing fraud in the public sector have more incentive and motivation as well as ability than in the private sector, due to the intense level of internal control in the public sector. Figure 2.11 shows that fraud between the private and public sectors can be classified into various categories. The figure also shows that a majority of the fraud lies in the public sector.

Figure 2.11: Classification of public sector fraud



Source: Giriunas and Mackevicius (2014: 146)

Giriunas and Mackevicius (2014: 147) explained that public sector fraud should be characterised according to its manifestation areas. The oldest fraud in practice is a misappropriation of public funds, which is not using the budget as it is intended. The majority of such fraud in state-owned enterprises are carried out using various fixed or current asset acquisition, production and recovery operations. Giriunas and Mackevicius (2014: 147) listed the most common fixed asset frauds in the public sector, which are:

- Goods or services allocated for reconstruction instead of repairs;
- Asset value is not corrected;
- The asset is sold to predefined individuals for the residual value; and
- Purchased fixed assets are attributed to current assets.

2.7 Conclusion

The efficiency of the supply chain determines the success of the organisation in the product offered. Public sector supply chain management determines the success rate of services delivered to the public. In addition, the efficiency also determines the increase in value for money in the delivery of services, doing more with less. However, if the efficiency is reduced by the Supply Chain Risk factors, lack of efficiency may cause disruptions and wastage of public funds. The mitigation or even elimination of these risk factors may increase value for money of the public sector in Supply Chain Management.

The literature review discussed the background relating to public sector supply chain management. This highlighted the malpractice that has come into the spotlight due to ineffective supply chain practices. This includes the mismanagement of public funds as well as attempts by GPT to improve the performance of the supply chain function. The concept of SCM showed that the function is important to the success of any organisation but more especially a public sector organisation. A strategic supply chain system also promotes operating with strategic intent rather than administrative outlook. This led to the discussion of the public sector supply chain framework as well as the challenges surrounding the function. These challenges are identified as risk factors; emphasising the importance of developing departmental strategies to mitigate the risk factors in an integrated approach rather than isolated challenges.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Chapter 3 presents the research design and methodology used to study the research questions and to make conclusions. It explains the basis for the approach used and demonstrates how the research design and methodology were applied to examine the SCM challenges in the GPT. The chapter explains the method of data collection employed in the study as this was important to ensure the study achieves its objectives.

3.2 Research philosophy

The research philosophy used for this study was the pragmatism approach as this study was based on the perception of the practical implementation of SCM processes in the public sector. This is to assist in improving the current inefficiencies despite the various initiatives to mitigate risks in SCM. Saunders et al. (2016: 143) stated that pragmatism is aimed at identifying practical problems and creating solutions. Therefore, this study aimed to contribute to the topic by providing a different perspective as the 'challenges' in SCM were highlighted as 'risk factors' in order to develop mitigation measures through an integrated solution.

3.3 Research methodology

For purposes of this study, a quantitative method was utilised to test the theory of SCM risk factors in GPT by measuring the perception of SCM officials in the GPT. According to Choy (2014: 99), quantitative research begins with a general area of study or issue of professional or personal interest. The researcher should narrow the focus to relevant factors of the topic by using literature. In addition, Choy (2014: 99) stated that a quantitative research methodology enables establishing the relation between different variables as this study did with SCM and the risk factors that compromise the efficient, effective and economical implementation of service-delivery objectives.

The goal of the study was to examine the risk factors in the implementation of public sector SCM in GPT. This study employed the mono method quantitative research methodology. A quantitative approach was also suitable to this study as challenges surrounding SCM are already known; unlike a qualitative research approach that is applied to a topic of which little is known. Antwi and Hamza (2015: 221) stated that quantitative researchers operate with the

assumption that the occurrence of events has one or more causal factors; which are described as probabilistic causes. The aim of this study was to establish and validate perceptions and to develop generalisations to contribute to the theory about SCM. Creswell (2014: 41) listed two broad classifications of quantitative research: survey and experimental research. This study used survey research to provide a quantitative description of "trends, attitudes and opinions by using questionnaires" as stated in Creswell (2014: 42). In the study, various variables were identified and linked to determine insights of SCM officials against various theories in public sector supply chains.

3.1.1 Deductive research

According to Saunders, et al. (2016: 145), the deductive approach assumes that a clear theoretical position is established before data is collected. The challenges surrounding the SCM risk factors relate to the theory presented in the literature review. Antwi and Hamza (2015: 222) indicated that deductive reasoning is theory testing which can confirm or disapprove theory surrounding the research. In addition, Antwi and Hamza (2015: 220) said researchers use deductive reasoning to deduce from previous studies the observable consequences that should occur with new empirical data if the theories are true.

From the theory relating to SCM risk factors, it is possible to determine which SCM challenges to focus on. SCM is experiencing challenges that can possibly be solved through analysing perceptions of SCM officials at GPT. Therefore, understanding what SCM practitioners perceive the problems to be could assist in locating the causes and possible solutions.

3.1.2 Survey strategy

A survey strategy is a quantitative tool used to collect perceptions of the population and data to inspect connections between variables. According to Saunders, et al. (2016: 181), the survey strategy is usually associated with the deductive approach which is used to answer questions of "who, what, where, how much and how many". In addition, Saunders et al. (2016: 181) indicated that the data collected using a survey strategy could be used to suggest possibly the cause of relationships between variables and to develop solutions if challenges occur. The relationship between the variables can be used to generate solutions using models.

3.1.3 Data collection instrument: questionnaire

One of the tools used in research to collect data by means of survey strategy is questionnaires. Pandey and Pandey (2015: 57) stated that a researcher requires various data-gathering tools or techniques. The data-collection technique used guides the researcher in data collection and evaluation. In addition, Pandey and Pandey (2015: 57) stated: "each tool is suitable for the collection of certain types of information". The tools include questionnaires, interviews, documentary surveys, observation techniques, and rating scales. Antwi and Kasim (2015: 223) indicated that quantitative research generally measures the scale of perception through a Likert-type rating scale. According to Saunders, et al. (2016: 457), a Likert-type rating scale consists of questions in which the respondent is asked to indicate "how strongly she or he agrees or disagrees" with the statements in the survey. For the purposes of this study, a questionnaire with Likert-type scales and documentary surveys were used to collect data.

The questionnaires used for the study assisted in receiving feedback from SCM practitioners in GPT and identified problems through the experiences of officials in different positions. According to Saunders, et al. (2016: 439), questionnaires assist the researcher in collecting feedback from many respondents timeously to receive accurate and relevant information. Permission was granted through an internal memorandum in the department that was approved by the Head of Department of the GPT. In addition, using questionnaires assists to maintain the anonymity of respondents while receiving relevant information. A total of 119 hard copies of self-administered structured questionnaires were distributed to the respective branches and completed by SCM officials. A total of 79 questionnaires were completed and returned. The completed questionnaires were dropped in sealed boxes in the office of one of the officials to ensure the anonymity of participating officials. In addition, the respondents' personal details were not required for completion of the questionnaire. The respondents were provided a week to complete the questionnaire. The data from the questionnaires were manually captured into a Microsoft Excel spread sheet for analysis. Since questionnaires are suitable for the study, this method has advantages and disadvantages as shown in Table 3.1.

Table 3.1: Advantages and disadvantages of questionnaire

Advantages	Disadvantages
Economical	This only brings limited responses
Time saving process	Lack of personal contact
Covers the research in a wide area	Greater possibility of wrong answers
Suitable for special type of responses	Chances of receiving incomplete responses are increased
Reliable in special cases	Sometimes answers may be illegible
	It may be useless for many problems

Source: Pandey and Pandey (2015: 59)

The table shows that the questionnaires were not only time saving but also economical. In addition, it enabled the researcher to cover a wider research area as compared to other data collection methods. However, the questionnaires only provided limited responses and no contact with the respondents. This increased the possibility of receiving wrong and illegible answers.

3.1.4 Pilot testing of the questionnaire

According to Saunders, et al. (2016: 473), the purpose of pilot testing is to refine the questionnaire to limit problems in answering the questions and recording the data once the surveys are received. Saunders et al. (2016: 473) stated that refining the questionnaire can also be achieved through consulting experts. In the case of this study, research experts at Statistical Consultation Services (Statkon) were consulted. The Statkon consultant reviewed the draft questionnaire and provided technical feedback that was implemented into the questionnaire. The questionnaire was then piloted with five officials in the SFRM at GPT; which assisted in identifying some errors that might have caused a challenge in the data analysis.

3.1.5 Unit of analysis, population and Sampling strategy

Officials in SCM in GPT were the target group for the study as they could provide insight into the processes in SCM. By scaling the perceptions of these officials, the study could gauge the true essence of the challenges of public sector SCM in GPT. The inclusion criteria for the target population included the following functions as these officials perform duties related to the implementation of SCM in GPT: The Provincial Supply Chain and Asset Management

(PSCAM), Sustainable Fiscal Resource Management (SFRM) and Financial Management Services (FMS) as indicated in the GPT 2015 Strategic Plan (GPT, 2014: 65). These officials were selected to participate in the study owing to their various levels of exposure to SCM in practice. In total 119 questionnaires were distributed, and 79 were completed and received from the respective programmes, as illustrated in Table 3.2. Thus, the questionnaire was distributed to all those who met the inclusion criteria as per the sample size. Therefore, sampling was not undertaken.

Table 3.2: Target population

Programme	Chief directorate (CD)(s)	Unit of analysis	Sample	Total completed responses	Response Rate
Provincial Supply Chain Asset Management	• Supplier Management and Development • Policy, Norms Governance Monitoring an Evaluation • Transversal Sourcing • Strategic Sourcing • Strategy Management	129	96	56	58%
Sustainable Fiscal Resource Management	Infrastructure Management	91	9	9	100%
Administration	Financial Management Services	156	11	11	100%
Administration	Internal Risk Management		3	3	100%
Total		**376**	**119**	**79**	

Source: Authors own construction

Table 3.2 shows the number of targeted respondents as well as the business unit in which the officials are employed. It was challenging to find respondents as most of the officials were under pressure finalising the financial statements for the financial year. I attempted approaching officials through the gatekeepers; however, I was not successful in attracting the full number of officials (119). Most of the officials are from the PSCM business unit, which is responsible for SC oversight in the province. The questionnaire was distributed to officials in the SFRM branch, PSCAM, Administration: Financial Management Services and Administration: Internal Risk Management not all the employees in these departments

completed the questionnaire. This was due to only 58 percent of officials from the PSCM business unit responding to the questionnaire and 100 percent responding from SFRM, 100 percent from Administration: Financial Management and 100 percent from Administration: Internal Risk Management respectively. From a total unit of analysis of 376 officials by means of non-probability sampling, purposive selection; in the identified business units, a total of 119 were identified based on officials that were available to participate in the study and 79 responses were received, which is a response rate of 66 percent. Respondents were given a week to complete the questionnaire. Officials that are practitioners in SCM were chosen to participate in the study; officials that do not operate in the SCM function were not chosen to participate. Not all officials were included because an understanding of SCM in the public sector was required to respond to the questionnaire adequately. The response rate would have been higher if officials could have secured time to complete the questionnaires; however, the period of distribution was the financial year end for the public sector. Respondents received a week to complete the questionnaire and two days extension if not complete. Table 3.2 shows the questionnaire collection rate from each of the three branches in GPT. The PSCM business unit is where most of the respondents are based; with 58 percent of respondents completing questionnaires.

Four branches in GPT complied with the inclusive criteria to participate in the study based on the areas of expertise in SCM in GPT. The PSCM branch is responsible “to promote and enforce transparency and effective Supply Chain Management and Asset Management in the Province” (GPT 2015/16 Annual Report, 2016: 42); therefore, insights into this branch would be from the point of maintaining accountability in SCM. In addition, PSCM gave insight into the procurement and management of immovable assets. The Sustainable Fiscal Resource Management: Infrastructure Chief Directorate assists in sourcing information regarding infrastructure procurement; this provided information on the oversight of infrastructure procurement in GPT.

Furthermore, the Financial Governance in the Transversal Internal Risk Management business unit, which is a source of information related to the risk posed by SCM to the department as well as to service delivery. The fourth branch is Administration: Financial Management Service that has the purpose to “promote accountability through the substantive reflection of financial activities as well as compliance with financial norms and standards in PFMA compliant institutions” (GPT 2015/16 Annual Report, 2016: 38). In the Financial Management Services, the procurement business unit operates to ensure that GPT meets its procurement demands as well as financial wellbeing.

3.1.6 Data analysis

According to Saunders, et al. (2016: 414), quantitative analysis techniques such as graphs, charts and statistics allow researchers to explore, present, and examine relationships and trends within data. Statistical analysis allows for making inferences that are more objective as compared to qualitative research that is more subjective. When the questionnaires were received, data were captured into a Microsoft Excel spread sheet to ensure the information from hardcopy to the computer is ready for analysis purposes. The captured data was checked by a fellow researcher in order to check consistency in the Excel spread sheets. The study used descriptive statistical analysis, as Saunders, et al. (2016: 444) stated that it enables the scholar to compare variables numerically. This was done in the study to compare variables such as corruption and service delivery in the procurement value chain. A comparison of different variables was done to determine the perception of respondents.

3.4 Time horizon

Time horizon refers to the period on which the study focused. According to Saunders, et al. (2016: 200), the time offers a snapshot (cross-sectional) or a diary (longitudinal) perspective. According to Saunders, et al. (2016: 200), a cross-sectional study is based on phenomena at a specific point in time. The phenomenon that was being assessed was SCM risk factors in GPT from January 2018 until March 2018. Therefore, this study employed a cross-sectional time horizon. In addition, the cross-sectional studies are normally used in survey studies that are used in academic projects that are time constrained. Therefore, the method is suitable to offer a snapshot into SCM in the public sector considering the limited time available to complete the study.

3.5 Validity

Validity is described as a means of accurate measurement as well as a means of verifying whether the intended variables are measured (Winter, 2000: 5). According to Winter (2000: 5), validity is closely associated with reliability that will assist in the replicability of the study in the future. Validity in the study was assured by focusing the population of the study to only officials operating in SCM functions to ensure respondents are able to answer the questionnaire.

3.6 Reliability

According to Saunders, et al. (2016: 451), threats to reliability include participant error and bias. Participant bias was mitigated by making the questionnaire anonymous; this ensured that no officials' employment was at risk. If the questionnaires were not made anonymous, the results would have shown some bias. In addition, due to the nature of the study relating to SCM in GPT, the data can be considered reliable due to the maintenance of anonymity.

In addition, the researcher used a Social Desirability Scale (SDS) as designed by Crowne and Marlowe (1960) to test honesty in answering less desirable behavioural questions and less desirable questions related to SCM. This scale was "developed according to a psychometric model avoiding the ambiguities of the statistical deviance approach" (Haghighat; 2007: 1). However, for purposes of this research, a Brief Social Desirability Scale (BSDS) according to Haghighat (2007: 1) was used to save time as the original questionnaire by Crowne and Marlowe (1960) which contained 33 questions in relation to the five questions in the version used for this study. The 33 questions would not have been feasible as the questionnaire by Crowne and Marlowe (1960) already contained 43 questions. According to Haghighat (2007: 1), "people tend to resort to social desirability in their responses to sensitive questions". The relevance of the questions in the questionnaire was directly linked to the research questions to reaching the objectives of the research. The results of using this scale are discussed in detail in Chapter 4 of the study.

3.7 Gaining Access

Access to secondary as well as primary data is important for the completion of the research study. This is the first step the researcher needs to consider when deciding on a topic. The researcher is an employee of GPT in the SFRM branch and had access to employees of the department at the time of the research study. According to Saunders, et al. (2016: 222), there are two layers of access that the researcher needs to penetrate to gain access to data, namely the physical as well as the gate keeper levels. The physical level is the level in which management approves the study in the organisation. For purposes of this study, the Head of Department (HOD) of GPT granted approval to conduct the study. This meant that the gatekeepers, which include the team leaders; would be free to participate in the study. However, this was a challenge as most team leaders were engaged in activities of finalising the year-end financial reporting, making time availability a constraint. The researcher had physical access to the GPT's one department and visited the branches under review to encourage survey participation.

Saunders et al. (2016: 222) listed the strategies useful to help gain access to the organisation. These according to Saunders et al. (2016: 222), including ensuring you are acquainted with and understand the organisation or group before making contact. For the researcher to gain access relating to the strategies above, the researcher could secure access to information in the organisation as an internal researcher as the researcher was in the employ of GPT. As a starting point, the researcher already had physical access to the organisation as an employee. However, due to time being limited, as the target group was in the process of finalising year-end financial reporting, officials were reluctant to participate. The researcher had to make numerous attempts in addition to the cooperation received from gatekeepers.

Through respondents who were available, the researcher could gain more contacts by means of referral. The purpose of the research was communicated from the institutional level, through a covering letter regarding the questionnaire as well as introductions to respondents. Communication with respondents was colloquial and simple to understand; no queries were received regarding the language used in the questionnaires. From inception, the researcher had access to the research material by engaging officials in various key GPT branches. Through these engagements, a perceived need to pursue the study was strengthened by the sentiments of the employees that maintained the study would add value to SCM in the public sector. Therefore, by being able to convince the target group of the possible value-add of the study, information was secured ethically. SCM practitioners will be able to benefit from the assessment of the risk factors in the organisation which may be used to address some challenges in their duties as SCM practitioners.

3.8 Ethical considerations

According to Saunders, et al. (2016: 249), ethical considerations need to be considered to ensure the credibility of information. This can be done by keeping respondents anonymous. According to Saunders, et al. (2016: 239) generally, ethics refers to the appropriateness of the researcher's behaviour in relation to the rights of those who become the subject of a researcher's work or are affected by it. Creswell (2014: 133) indicated that ethical considerations strengthen the credibility of the research. Creswell (2014: 132) considered ethical issues in qualitative, quantitative, and mixed methods research.

According to Creswell (2014: 132), the credibility of the research study is determined by the way information is accessed from respondents in all five stages of the process. At no point was it permitted to force or manipulates respondents for access to information. In addition,

respondents were allowed to withdraw from the study with no repercussions. This manner of retrieval of information would have been unethical and may have raised questions as to the validity of the information assessed. The researcher distributed the questionnaires to the different branches in boxes that allowed respondents to submit anonymously in sealed boxes without anyone seeing the identity of the respondent. In addition, the respondents were given a week to complete the form without the researcher's influence. The researcher received ethical clearance from the University of Johannesburg (UJ) after the study was approved by GPT after a request to conduct the study on the organisation was submitted. The HOD approved a memo from the Human Resources (HR) business unit which said the study might proceed, awarding permission to distribute questionnaires as well as to publish the study upon completion.

3.9 Limitations of the study

Limitations in responses were found, as this study was conducted while GPT officials were finalising year-end financial reporting. Some of the respondents did not apply their mind in answering the questionnaires and this is reflected in the SDS. This made it a challenge to receive feedback from officials. In addition, the lack of personal contact with officials constrained the ability to convince more officials to complete the questionnaires. Furthermore, this made it difficult to receive complete responses as officials were short of time, 34% of the questionnaires were not returned.

3.10 Summary

The methodical planning of a research methodology and design is important to achieve the research question and objectives. In addition, a clear design ensures that the study can be replicated by other researchers to contribute to the field. The study provided the researcher with methods to validate and ensure the reliability of the study for sensitive topics such as SCM in the public sector. Furthermore, this chapter shows the process the researcher used to ensure approval to conduct a study in the GPT, as without ethical clearance from the HOD, reliability may not have been achieved.

CHAPTER 4: RESEARCH RESULTS AND INTERPRETATION

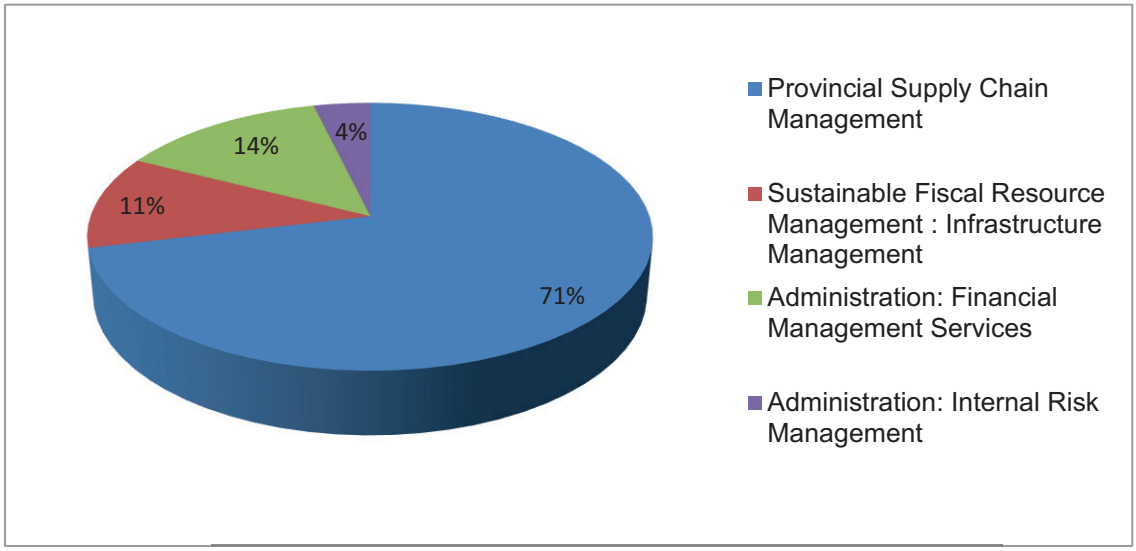
4.1 Introduction

This chapter presents the research results and interprets them in order to make inferences. It shows the working experience of the SCM respondents as well as the educational background. Furthermore, results regarding the SDS are presented and interpreted. The results regarding the skills shortage in SCM as a risk to sound procurement are presented. This is followed by the results for the practice of decentralisation of SCM. Subsequently, results concerning the limitations in the authority of the AG are presented. In addition, a presentation of the responses for fraud and corruption as a risk factor was interpreted. It should be noted that the responses for question one was not included in the results and interpretation as respondents did not respond to the question. The reason for this could have possibly been to maintain anonymity. Furthermore, question 5 regarding the qualifications of the respondents was also excluded as most respondents also left this question out of the responses.

4.2 The demographic profile of respondents

Out of the four business units that participated in the study, 71 percent of the respondents were based in the PSCM departmental branch, followed by Administration: Financial Management Services with 14 percent, Sustainable Fiscal Resource Management with 11 percent and Administration: Internal Risk Management with four percent. Figure 4.1 shows the question two of the questionnaire which is the composition of the respondents which are mainly in PSCM owing to it being the function that specialises in SCM in GPT.

Figure 4.1: Question 2: Distribution of respondents from various branches



The number of years of work experience contributes to the ability of an employee to execute responsibilities. This is consistent with a study conducted by Bhargava and Anbazhagan (2014: 105), which found that there is a correlation between job experience and job performance. Over third, (39%) of respondents had one to six years of work experience at GPT, while 29 percent had between six to ten years' experience at GPT. Just over a quarter (26%) of respondents had one year or less experience in GPT. Furthermore, six percent of the respondents had 10 to 15 years' work experience at GPT. However, no respondents had more than 15 years' experience. Figure 4.2 shows the working experience of the respondents in GPT which is question three of the questionnaire.

Figure 4.2: Question 3: Working experience of the respondents in GPT

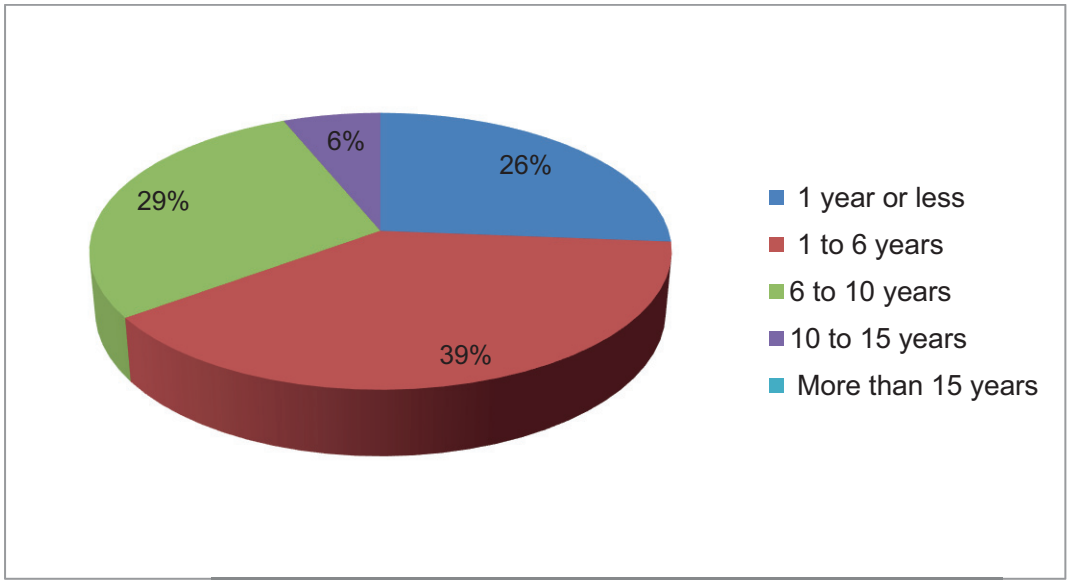


Table 4.1 lists the types of qualifications at GPT that SCM respondents hold which was question four of the questionnaire. Some respondents hold more than one qualification, and multiple responses were allowed to the question. Therefore, the responses do not show a number equal to the 79 respondents, but 93 chosen qualifications by 79 respondents. A total of 32 percent of the respondents hold a qualification in Accounting. This is followed by Logistics as an area of exposure, with 11 respondents holding a qualification in Logistics Management. Five respondents completed Business Management, Public Administration and Public Management respectively. Four respondents completed a qualification in Auditing and Economics respectively and three in Law. Two respondents completed qualifications in Business Management, Information Technology, Risk Management and Strategic Supply Chain respectively. One official completed a qualification in B-BBEE, and Human Resources, Purchasing/Procurement Management, as well as Secretarial Studies. Nine respondents indicated that their qualifications were obtained in Engineering and Construction.

The above demographic information of respondents in GPT shows that most of the SCM respondents are from the PSCM branch of the department. Most of these respondents have 1 to 6 years in GPT and most likely hold a qualification in Accounting. The results show that in SCM in GPT officials are unlikely to have completed a qualification in SCM or logistics; which is consistent with the study conducted by National Treasury on SCM in provincial treasuries in the nine provinces. This also relates to the skills mismatch in a study by Quintini (2011: 23) titled “Over-Qualified or Under-Skilled: A Review of Existing Literature”. In the study, Quintini (2011: 23) showed that the changes in the needs of the economy drive a mismatch of the skills of employees in an organisation.

Table 4.1: Question 4: Types of qualifications at GPT for SCM respondents

Qualification	Number of respondents
Accounting	30
Auditing	4
B-BBEE	1
Business Administration	5
Business Management	2
Economics	4
Education	0
Human Resource	1
Information Technology	2
Law	3
Logistics	11
Public Management	5
Public Administration	5
Public Policy	0
Public Relations	0
Purchasing/Procurement Management	1
Risk Management	2
Supply Chain Management (SCM)	5
Secretarial	1
Social Science	0
Strategic Supply Chain Management	2
Taxation	0
If other, please specify: Civil engineering, Construction Management, Mechanical Engineering	9
Total number of responses (qualifications)	**93**

4.3 Social Desirability Scale

According to Crowne and Marlowe (1960: 349), the SDS is used to test the interest in the problem of response distortion concerning attempts of statistical correction for “faking good” or “faking bad”. The combination of analysis of responses and responses from SDS allow for the validity of responses in the questionnaire to be tested. The SDS is used to test the ability, to be honest with one’s self by not using socially desirable responses. This is considering the nature of the topic, which may have prompted respondents to exaggerate. The results of the questions are indicated in Table 4.2.

Table 4.2: Responses to the Brief Social Desirability Scale feedback

	Question	Yes	No
36	Would you likely smile at people every time you meet them?	71.25%	28.75%
37	Do you always practise what you preach to people?	63.75%	36.25%
38	If you say to people that you will do something, do you always keep your promise no matter how inconvenient it might be?	66.25%	33.75%
39	Would you ever lie to people?	50.00%	50.00%
40	Would you ever laugh at a dirty joke people may make?	45.00%	55.00%

In order to determine the level of bias from the respondents the BSDS has been employed. The response rate of the respondents toward a more socially desirable answer may indicate limited validity versus truthful responses. Table 4.2 shows the BSDS feedback as completed by SCM respondents as part of the distributed questionnaires. For the question, "Would you likely smile at people every time you meet them?", 71.25 percent of respondents responded 'yes', which is socially more desirable and 28.75 percent responded 'no', which is less socially desirable. It would be socially desirable to smile at people all the time. Most of the respondents answered 'yes' to the statement. This means respondents answered in a socially desirable manner.

For the question, "Do you always practise what you preach to people?", 63.75 percent answered 'yes', and 36.25 percent answered 'no'. For this question, it would be socially desirable to practice what you preach. Most of the respondents answered 'yes', which is a socially desirable answer.

For the question, "If you say to people that you will do something, do you always keep your promise no matter how inconvenient it might be?", 66.25 percent indicated 'yes' and 33.75 percent indicated 'no'. Answering 'yes' to the question shows social desirability, with most respondents answering 'yes', this means that this question was answered according to social constructs.

For the question, "Would you ever lie to people?", 50 percent answered 'yes', and 50 percent responded 'no'. Lying to people is socially undesirable, and half of the respondents answered 'yes' and the other half 'no', showing more people answering undesirably to this question.

Finally, to the question, “Would you ever laugh at a dirty joke people may make?”, 4 percent of respondents answered ‘yes’, and 55 percent answered ‘no’. Respondents maintained socially desirable responses even for this question.

The results lean mostly to the scale of responses being socially desirable, according to the responses reported through the BSDS questionnaire and may have been answered in a socially acceptable manner. The results showed that responses leaned towards the more desirable end of the scale, indicating the need for the results to be read in this context. In the context of public sector SCM in GPT, employees may have answered some questions in the questionnaire in a socially desirable manner; this impact may have been minimised through the anonymity of the questionnaires. However, the reader may have to be cautioned to interpret the results presented with the BSDS in mind.

4.4 Supply chain management skills shortage

The human resource of an organisation is important as the organisation cannot function optimally without this resource. A skills shortage may lead the organisation to become ineffective; thereby posing a risk to the overall output. SCM risk factors include skills shortages or the lack of skills to implement outputs related to organisational mandate and objectives effectively. Table 4.3 shows the responses to statements relating to SCM skills shortages as a risk factor to SCM.

Table 4.3 Responses to supply chain management skills shortage

Q	Statements	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
6	I think that there is a Supply Chain Management skills shortage in the Gauteng Provincial Treasury.	2.50%	17.50%	41.25%	30.00%	8.75%
7	I believe that the lack of Supply Chain Management skills is the leading cause of the mismanagement of public sector funds.	2.50%	15.00%	50.00%	30.00%	2.50%
8	It is correct to say that the inefficiencies in procurement are attributable to a skills shortage in Supply Chain Management in Gauteng Provincial Treasury.	0.00%	28.75%	53.75%	8.75%	8.75%
9	I think the errors in the application of Public Supply Chain Management can be attributed to the limited skills capacity of Supply Chain Management in the Gauteng Provincial Treasury.	0.00%	17.50%	62.50%	17.50%	2.50%
10	I would say that the misalignment in qualifications, as well as training, leads to non-adherence to public sector supply chain Management legislation in the Gauteng Provincial Treasury.	2.50%	28.75%	38.75%	26.25%	3.75%
11	I think the skills shortages have led to increased vacancies in other Provincial Treasuries.	5.00%	30.00%	32.50%	15.00%	17.50%
12	I would say the lack of public sector related experience translates into the lack of sound Supply Chain Management practice in the Gauteng Provincial Treasury.	2.50%	32.50%	38.75%	12.50%	13.75%
13	I think that the lack of professional affiliation has led to the lack of Supply Chain Management sound practice in the Gauteng Provincial Treasury.	2.50%	27.50%	47.50%	16.25%	6.25%

For the statement, "I think that there is a Supply Chain Management skills shortage in the Gauteng Provincial Treasury", in question 6 of the questionnaire, the responses to the statement indicate that 41.25 percent of respondents agree and 30 percent strongly agree.

This shows consistency with the finding from the National Treasury (2016d: 22) that most respondents in the study conducted on provincial treasuries hold a qualification in Accounting, rather than specialising in Logistics or SCM. The perceptions of the GPT officials to this statement are consistent with the study conducted by National Treasury (2016d: 4), which indicated that SCM employees have been in government for many years without appropriate SCM-related academic qualifications and relevant training. In addition, Heyns and Luke (2012: 113) stated that there is a shortage of SCM skills in the country. In addition, the National Treasury (2016d: 22) also highlighted the lack of willingness by officials to pursue specialised studies in SCM.

However, 2.5 percent of the respondents strongly disagree while 17.5 percent disagree with this statement and 8.75 percent who did not know how to respond to the question. This may be aligned with statement 10 in the questionnaire that states "I would say that the misalignment in qualifications, as well as training, leads to non-adherence to Public sector supply chain Management legislation in the Gauteng Provincial Treasury". This is an indication that respondents do not associate misalignment as a skills shortage; therefore, does not pose a risk for sound procurement implementation.

To the statement, "I believe that the lack of Supply Chain Management skills is the leading cause to the mismanagement of public sector funds", in Question 7 of the questionnaire, nearly one third of the respondents strongly agree, and half agree to the statement. These responses show consistency with the National Treasury (2016d: 22) in the study on the importance of placing expert knowledge and skills to ensure compliance to the public sector SCM framework to avoid unfavourable audit opinions. However, the results from the question show that 17.5 percent of respondents disagree or strongly disagree and 2.5 percent did not know how to answer the question. Respondents that disagree with this statement may be due to the perception that there is no skills shortage in public sector SCM in question 6 of the questionnaire. If the public sector is to manage the mismanagement of funds; measures may need to be implemented to improve the skills of SCM officials.

The statement, "It is correct to say that the inefficiencies in procurement are attributable to a skills shortage in Supply Chain Management in Gauteng Provincial Treasury", in question 8 of the questionnaire, the responses to the question indicate just above half, 53.75 percent of respondents agree and 8.75 percent strongly agree, followed by 28.75 percent that disagrees. Respondents that agree to the above statement show a perception that corresponds with a study by Ambe and Badenhorst-Weiss (2012: 249) that identified challenges in South African public sector SCM that includes the lack of adequate knowledge, skills and capacity.

Furthermore, the National Treasury (2016d: 4) indicated that the government is the largest capital spender, therefore requiring appropriate skilling of public sector SCM employees. In addition, 8.75 percent indicated they do not know about the content of the question. Disagreement to the statement by nearly 30 percent of the respondents shows that some of the respondents do not perceive that there is a relationship between skills shortage and sound procurement practices as indicated in question 7 of the questionnaire.

Responses to the statement, "I think the errors in the application of Public Supply Chain Management can be attributed to the limited skills capacity of Supply Chain Management in the Gauteng Provincial Treasury" in question 9 of the questionnaire, the responses to the question indicate that 62.50 percent of respondents agree and 17.50 percent strongly agree. Furthermore, 17.5 percent disagree, with only 2.5 percent of the respondents indicating they did not know how to answer the question. The responses that agree and strongly agree may indicate consistency with the study conducted by National Treasury (2016d: 4) that stated that public sector SCM officials have been operating for many years without appropriate SCM-related academic qualifications and relevant training. This is a challenge for accurate execution of the procurement process.

Furthermore, the risk that is posed by a lack of skills capacity in procurement may lead to inefficiencies in the value chain, such as delayed service delivery, which eventually may cause protests that are violent in nature. Question 9 is aligned with a report by SALGA (2015: 11) that indicated that a consequence of protest actions is damage to infrastructure and public amenities, which is also detrimental to service delivery. This means that the department may have to repair or replace damaged amenities, by moving funds from other deliverables. Consequently, service delivery may be fragmented or not even provided at all. In addition, the errors in the application of SCM in the public sector show that these errors may be a result of the lack of skilled personnel processing procurement. As indicated by Ambe and Badenhorst-Weiss's article (2012: 249), the lack of adequate knowledge, skills and capacity is one of the key challenges in the implementation of procurement.

The responses to the statement, "I would say that the misalignment in qualifications, as well as training, leads to non-adherence to Public sector Supply Chain Management legislation in the Gauteng Provincial Treasury", in Question 10 of the questionnaire. The responses show that more than one third or 38.75 percent of respondents agree and 26.25 percent strongly agree with the statement. These responses are consistent with Quintini (2011: 23) that stated there might be a mismatch in modern organisational skills due to the nature of the constantly changing economy. Furthermore, 28.75 percent disagree and 2.50 percent strongly disagree with the statement in the questionnaire. In addition, 3.75 percent responded that they did not

know about the subject of the statement in the questionnaire. The opposing perception to the statement may be due to the filled vacancy level in GPT. This means that officials have qualifications; however, the qualifications are not specially aligned to SCM operational requirements. In addition, this leaves room for error and inefficiencies as shown in questions 8 and 9 of the questionnaire.

Responses to the statement; “I think the skills shortages have led to increased vacancies in other Provincial Treasuries” in Question 11 of the questionnaire, showed a third or 32.5 percent of respondents agree and 15 percent strongly agree to there being increased vacancies in other provincial treasuries. The response to the question is inconsistent with the finding by the National Treasury (2017a: 5) that the PFM environment experiences skills shortages, with vacancy rates as high as 34 percent, coupled with turnover rates of 14.6 months. This is followed by the finding that nearly one third or 30 percent of respondents disagree and 5 percent strongly disagree. In addition, 17.5 percent do not know any information regarding this statement. This means that the scale of the challenge of skills shortages in the profession may not only be noticeable in GPT but may similarly be the reality in eight other provincial treasuries. Furthermore, this may also indicate the scale of the challenge in the market as the pool of talent may not be enough to supply the demand required for optimal operations of public sector institutions.

To the statement that, “I would say the lack of public sector related experience translates into the lack of sound Supply Chain Management practice in the Gauteng Provincial Treasury” in question 12 of the questionnaire, the results show that 38.75 percent of the respondents agree and 12.50 percent strongly agree. Responses to the statement are consistent with an article by Bhargava and Anbazhagan (2014: 105) that states that there is a relationship between job experience and job performance. The study conducted by Bhargava and Anbazhagan (2014: 105) found that experience is a better predictor for less complex jobs than for high complexity jobs. This shows that experience may be a challenge relating to performance in SCM; however, the challenge of performance is also attributable to training in specialised skills. Furthermore, Kaye (2014: 17) stated that public sector SCM is more challenging, even though it is less complex compared to the private sector because implementation according to legislative requirements is a critical factor. This means that candidates may require public sector SCM experience in order to operate optimally in the public sector environment. The responses are followed by 32.50 percent of the respondents that disagree and 2.50 percent that strongly disagree. The opposing perception may be due to respondents disagreeing with Kaye (2014: 17) about the complex environment of public sector SCM that requires prior exposure in order to adapt and operate optimally.

To the statement, “I think that the lack of professional affiliations has led to the lack of Supply Chain Management sound practice in the Gauteng Provincial Treasury”, in question 13 of the questionnaire, the responses show that 47.50 percent of respondents agree and 16.25 percent strongly agree that the lack of professional affiliation has led to the lack of sound SCM practice. Patel (2014: 8) showed that professional bodies aim to offer qualifications, set conditions for maintaining competence, as well as to maintain and enforce a code of conduct. These are all important factors that maintain skill competency and thus an effective organisation. This means that SCM in GPT may be struggling to assist SCM officials in obtaining relevant qualifications, set conditions for maintaining competence and enforce conduct. Furthermore, this indicates that officials are not held accountable through professional bodies as most SCM practitioners are not members of these bodies. The respondents that disagree with the statement include 27.50 percent and 2.50 percent who disagree or strongly disagree respectively. Respondents that disagree with the statement may be due to the perception that there is no indication of a skills shortage in GPT in question 6 of the questionnaire. This opposing view is also aligned with respondents thinking that a low vacancy rate means that the organisation is operating with full capacity as shown in question 11.

4.5 Decentralisation of functions

Decentralisation of functions such as SCM may lead to advantages as well as disadvantages, depending on the nature of goods and service as well as the environment in which the system is implemented. In large organisations, just as the public sector transversal functions such as SCM may need to be decentralised; however, some elements may be centralised. Table 4.4 shows responses for supply chain management decentralisation as a risk factor to SCM.

Table 4.4: Responses for supply chain management decentralisation

Q	Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
14	Is it correct to say that Public Sector procurement is decentralised?	6.25%	17.50%	55.00%	15.00%	6.25%
15	I see the decentralisation of procurement as a risk factor in achieving sound Supply Chain Management practices.	3.75%	15.00%	46.25%	32.50%	2.50%
16	The decentralisation of Public Sector procurement leads to loopholes in the procurement system in the Gauteng Provincial Treasury.	3.75%	28.75%	37.50%	23.75%	6.25%
17	I believe that decentralisation leads to inefficiencies in the Supply Chain Management system in the Gauteng Provincial Treasury.	2.50%	33.75%	36.25%	17.50%	10.00%
18	Decentralisation of supply chain processes contributes to the reduction of wastage.	5.00%	36.25%	36.25%	11.25%	11.25%
19	The centralisation of Supply Chain processes encourages efficiency in the Supply Chain Management system.	2.50%	15.00%	47.50%	28.75%	6.25%
20	I think centralisation of transversal contracts to Gauteng Provincial Treasury and National Treasury reduces the risk of fraud and corruption.	6.25%	10.00%	47.50%	36.25%	0.00%
21	The Central Supplier Database is effective in promoting the efficient application of Supply Chain Management in the Gauteng Provincial Treasury.	0.00%	15.00%	48.75%	31.25%	5.00%

To the statement "Is it correct to say that Public Sector procurement is decentralised", in question 14 of the questionnaire, the results indicate that just over half or 55 percent of respondents agree that procurement in the public sector is decentralised and 15 percent strongly agree with this statement. This is consistent with the statement by former Minister of Finance Pravin Gordhan (2013: 28) that SCM in the public sector is highly fragmented and decentralised in nature. On the contrary, 17.50 percent of respondents disagree, and 6.25 percent strongly disagree with Question 14 of the questionnaire. However, 6 percent of respondents could not answer the question. The contrary perception may be due to respondents appreciating the benefits in the centralisation of SCM aligned with question 19.

This means that the perception is mostly that decentralisation is stifling sound procurement, and centralisation principles may assist to improve risks associated with decentralisation.

In relation to the statement, “I see the decentralisation of procurement as a risk factor in achieving sound Supply Chain Management practices” in question 15 of the questionnaire. This shows almost half or 46.25 percent agree and 32.55 percent strongly agree with the statement. The response is consistent with Ambe (2016: 280) that indicates that the public sector has 36 different SCM systems that are poorly integrated and manual, which poses a risk to achieving sound SCM practices. This means that public sector procurement may be a risk to achieving sound SCM practices due to it being highly decentralised in nature, as indicated in Question 14. In contrast, 15 percent of the respondents disagree, and 3.75 percent strongly disagree with the statement. However, only 2.50 percent of the respondents do not know how to answer this statement. The respondents that disagree and strongly disagree may be aligned to the benefits associated with decentralisation stated in question 18 of the questionnaire.

For the statement “The decentralisation of Public Sector procurement leads to loopholes in the procurement system in the Gauteng Provincial Treasury” in question 16 of the questionnaire, a third of the respondents or 37.50 percent agree, and 23.75 percent strongly agree with the statement. The perception of the respondents is consistent with Lambert and Cooper (2000: 71) that stated that a “successful SCM requires a change from managing individual functions to centralised activities into key SC processes”. The loopholes that occur in a decentralised approach may result in inefficiencies in the supply chain value chain. In contrast, 28.75 percent disagree, and 3.75 percent strongly disagree. Respondents may align with question 18 that indicates that decentralisation holds benefits inasmuch as it has disadvantages. However, 6.25 percent of the respondents could not agree or disagree with the statement.

The statement, “I believe that decentralisation leads to inefficiencies in the Supply Chain Management system in the Gauteng Provincial Treasury”, in question 17 of the questionnaire, the responses to the statement indicate that one third or 36.25 percent of respondents agree and 17.50 percent strongly agree. In contrast, 33.75 percent disagree, and 2.50 percent strongly disagree. This may be due to the perception that decentralisation holds some benefits such as lower administration cost savings. This is followed by 10 percent who do not know how to answer the statement. With regards to the statement, “Decentralisation of supply chain processes contributes to the reduction of wastage “in question 18, the responses indicated that 36.25 percent agree and 11.25 percent strongly agree with the statement, while just over a third or 36.25 percent disagree and 5 percent strongly disagree with the statement.

Furthermore, 11.25 percent of respondents did not have the knowledge to answer the question. Responses for the two statements are consistent with the statement that the fragmented nature of SCM reduces efficiency in the public sector.

The responses that agree are consistent with the findings relating to the benefits of joint procurement in the public sector by the (2008: 2) which showed that the key benefits of decentralisation include lower prices and administrative cost savings. In the case of Question 17, the increased prices and administrative costs are some of the reasons for the inefficiencies in the value chain. Therefore, due to the loopholes that are caused in the value chain in question 17 of the questionnaire, inefficiencies are bound to occur as a result of the decentralised implementation of procurement. Furthermore, exploring the advantages and challenges of a centralised system may improve the prevalence of these challenges.

To the statement, “Centralisation of Supply Chain processes encourages efficiency in the Supply Chain Management system”, in question 19 of the questionnaire, the responses indicate that almost half or 47.50 percent agree and 28.75 percent strongly agree that centralisation of SCM processes encourages efficiency in the SCM system. This is followed by 15 percent of respondents disagreeing and 2.50 percent strongly disagreeing. Furthermore, 6.25 percent chose not to respond to the statement. This suggests that most respondents see centralisation as a means to encourage efficiency in the SCM system as current reforms are advocating for some functions to be centralised rather than the total decentralisation of public sector SCM. This is consistent with the study released by the European Commission (2008: 2) about the benefits of centralised procurement. Furthermore, a centralised model may be adopted incrementally in the South African public sector if it is found that the gains outweigh the losses.

The statement, “I think centralisation of transversal contracts to Gauteng Provincial Treasury and National Treasury reduces the risk of fraud and corruption”, in question 20 of the questionnaire, the results show that 47.50 percent agree and 36.25 percent strongly agree with the statement. This shows that there is a positive perception regarding efforts to centralise through the use of transversal contracts as it is beneficial in the SCM value chain. This is consistent with the study conducted by the European Union (2008: 2) concerning the benefits of centralised and decentralised procurement. In contrast, 10 percent disagree and 6.25 percent strongly disagree with the statement. Respondents that disagree with the statement may see decentralisation benefits outweighing the costs compared to those of centralisation.

For the statement, “The Central Supplier Database is effective in promoting the efficient application of Supply Chain Management in the Gauteng Provincial Treasury”, in question 21

of the questionnaire, the results showed that almost half or 48.75 percent of respondents agree and 31.25 percent strongly agree with the statement. In addition, 15 percent disagree and 5 percent did not know how to respond to the question. The effectiveness of a centralised approach is consistent with a comparison conducted by Brooks (2016: 44-47), which shows that inasmuch as decentralisation is easier to customise; centralisation reduces operational and administrative costs. In addition, Brooks (2016: 44-47) stated that centralisation promotes transparency and effective management controls, which are all attributes required in public procurement.

The CDS is being seen as an effective tool for the promotion of SCM in GPT. Transversal contracting is seen as a strong mechanism to reduce fraud and corruption and one that increases prevalence as a result of decentralised procurement, as indicated in question 20. Furthermore, the centralisation of some aspects of procurement improves efficiency as shown in question 19. This may indicate that centralisation systems may be required to improve the risk posed by a decentralised approach.

4.6 Authority of Auditor General

The function of an auditor is necessary to maintain the overall well-being of any organisation and to measure the attempt of the organisation in achieving its strategic objectives. In achieving these strategic objectives, the organisation needs to organise the use of its resources; wasteful use of these resources is a risk to the organisation's attempt to achieving its objectives. At the centre of the use of organisational resources, especially financial resources, is SCM. This is pertinent in the public sector where financial resources are generated mainly from taxes. The Auditor General is central to ensuring accountability to those that are responsible for the use of public finances. Table 4.5 shows the responses to the limitations of the authority of the AG.

Table 4.5 Responses to the limitations in the authority of the AG

Q	Statements	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
22	Non-compliance to audit recommendations related to Supply Chain Management is a risk factor to sound practice of procurement in GPT.	2.50%	7.50%	47.50%	33.75%	8.75%
23	I believe the authority of the Auditor-General is limited to reporting.	1.25%	26.25%	33.75%	13.75%	25.00%
24	The Auditor-General as a Chapter 9 Institution has been able to ensure the Gauteng Provincial Treasury complies with effective procurement processes.	5.00%	8.75%	65.00%	12.50%	8.75%
25	Recommendations in Auditor-General Annual Reports ensure effective procurement processes.	2.50%	8.75%	68.75%	15.00%	5.00%
26	I think Gauteng Provincial Treasury complies with recommendations from the Auditor-General.	0.00%	13.75%	45.00%	25.00%	16.25%

The statement, "Non-compliance to audit recommendations related to Supply Chain Management is a risk factor to sound practice of procurement in GPT", in question 22 of the questionnaire. This shows results that indicate 47.50 percent of respondents agree and 33.75 percent strongly agree with the statement. This is consistent with the AGSA being an organisation that is used to ensure that officials perform in line with departmental objectives as well as to promote accountability and to encourage public satisfaction. In addition, this statement corresponds with Yee, Sujan, James and Leung (2008: 155) that stated that Internal Auditing (IA) could help the organisation improve inefficiencies for resources to be allocated to value adding projects, more especially external auditing. The responses are followed by 7.5 percent that disagrees and 2.5 percent that strongly disagree. However, a total of 8.75 percent did not know how to answer the question. Opposing views corresponds to question 24 of the questionnaire that states that the Auditor General as a Chapter 9 Institution has been able to ensure the Gauteng Provincial Treasury complies with effective procurement processes. This implies that some of the respondents think that non-compliance to audit recommendations is not a risk factor to sound procurement.

The statement, "I believe the authority of the Auditor-General is limited to reporting" in question 23 of the questionnaire, the results show that a third or 33.75 percent of the respondents agree

and 13.75 percent strongly agree with the statement. These respondents are followed by 26.25 percent that disagrees and 1.25 percent who strongly disagree. This is followed by 25 percent of respondents that do not know how to answer the question. The responses that agree and strongly agree are consistent with the Auditor-General (2017: 1) stating that there are audit limitations like “internal control, that is an unavoidable risk that some, even material, misstatements in reported information may not be detected, and the completeness and the accuracy of the information reported are not guaranteed”.

In addition, the Auditor-General (2017: 1) focuses on specific areas in key legislation, and the audit does not provide a guarantee that all applicable legislation has been complied with. This may mean that even though the Auditor General is mandated as a Chapter 9 Institution to enforce accountability of public sector organisations; the Institution cannot guarantee implementation of recommendations in audit reports. The Auditor General may not be achieving accountability only through recommendations that are a result of audits conducted on public sector organisations as indicated in Question 22. This may indicate that reporting by the Auditor General is only limited to reporting of these recommendations without ensuring implementation and accountability. However, respondents that disagree and strongly disagree have a perception that the audit reports do not limit the authority of the Auditor General; which aligns to question 24 of the questionnaire.

The statement that “The Auditor-General as a Chapter 9 Institution has been able to ensure the Gauteng Provincial Treasury complies with effective procurement processes” in question 24 of the questionnaire. The responses illustrate that 65 percent of the respondents agree and 12.5 percent that strongly agrees with the statement. This is consistent with Fourie (2015: 42), that stated that the role of the AGSA is to conduct assessment audits in public sector SCM that ensure that it is fair, transparent, competitive and cost effective. This shows that there is a good level of trust between the AGSA and GPT. This is followed by 8.75 percent that disagrees and 5 percent that strongly disagree. However, 8.75 percent did not know much information regarding the statement. However, respondents that disagree with the statement may align their perception towards the view that the authority of the Auditor General may be limited to reporting as indicated in question 23 of the questionnaire.

To the statement that “Recommendations in the AG’s annual report ensure effective procurement processes” in question 25 of the questionnaire, these responses indicate 68.75 percent of respondents agree, and 15 percent strongly agree with the statement. In addition, 8.75 percent of the respondents disagree, and 5 percent did not know how to answer the question. The results to question 25 indicate consistency with the mandate of the Public Audit Act of 2004 that the AG is given the authority to report on the financial health of public

institutions. This means that the Institution is operating effectively; however, the respondents that disagree with the statement may not see the audit process improving the situation with procurement that is aligned with question 22.

The statement that “I think Gauteng Provincial Treasury complies with recommendations from the Auditor-General” in question 26 of the questionnaire, the proportion of respondents who agree with the statement was 45 percent and 25 percent strongly agree. Furthermore, 13.75 percent disagree altogether. In addition, 16.25 percent did not know how to answer the question. This is consistent with the AG supporting and guiding the department in improving SCM practices in the organisation. However, the authority of the AG is only limited to reporting and not consequence management, which does not give the institution the ability to enforce recommendations. However, as shown in questions 24, 25 and 26, the recommendations made by the AG are well received in GPT, as they are used as an early warning signal for public sector organisations of degradation of the health of the organisation. Furthermore, the AG may assist the department with the implementation of the audit recommendations. However, accounting officer organisations concerned cannot be compelled by the AG to implement. Furthermore, the AG cannot ensure implementation through penal measures. In addition; the respondents that disagree with the statement may perceive the organisation as not complying to the required recommendations, therefore, relating to question 23 regarding the limited authority of the Auditor General.

4.7 Fraud and corruption

The South African public sector is afflicted by fraud and corruption that inhibit the ability of public sector organisations to achieve its objectives. Fraud and corruption are one of the causal factors of inefficiencies in any organisation, even outside the public sector. The presence of these two risk factors requires firm mitigation in order to reduce opportunities that may enable fraud and corruption. Table 4.6 shows the responses relating to fraud and corruption as a risk factor to SCM.

Table 4.6: Responses regarding fraud and corruption

Q	Question	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
27	Corruption is a risk to sound procurement execution.	0.00%	2.50%	47.50%	50.00%	0.00%
28	Fraud is a risk to sound procurement execution.	0.00%	0.00%	50.00%	50.00%	0.00%
29	Corruption is a result of the loopholes in legislation.	6.25%	23.75%	41.25%	22.50%	6.25%
30	I think fraud is a result of the loopholes in legislation.	8.75%	33.75%	43.75%	11.25%	2.50%
31	I would say that corruption and fraud in procurement disrupts service delivery.	0.00%	0.00%	43.75%	56.25%	0.00%
32	It is true to say that corruption causes wastage of public funds.	0.00%	0.00%	31.25%	68.75%	0.00%
33	Fraud causes wastage of public funds.	0.00%	0.00%	38.75%	62.50%	0.00%
34	The organisational culture in the public sector is tolerant of fraud and corruption.	5.00%	26.25%	45.00%	17.50%	6.25%
35	Lack of consequence management encourages fraud and corruption.	2.50%	5.00%	37.50%	42.50%	12.50%

The statement, "Corruption is a risk to sound procurement execution" in question 27 of the questionnaire), results show almost half or 47.50 percent of respondents agree, and another half or 50 percent strongly agree to the statement with only 2.50 percent that disagrees. In question 28 of the questionnaire applying to the statement "fraud is a risk to sound procurement execution" resulted in half or 50 percent of respondents agreeing and half 50 percent strongly agree that corruption is a result of loopholes in legislation. This indicates respondents agree that fraud and corruption are a risk to sound procurement execution. Both responses to the statements are consistent with cases relating to the abuse of power that has been on the decline, as shown by Corruption Watch 2016 Report (2014: 15). The use of power in positions of authority is a result of loopholes in the system that may be bypassed by officials. Employment corruption cases reported in the Corruption Watch 2016 Report have also increased between 2012 and 2016, representing a lack of progress concerning the elimination of corruption in the country. This means that fraud and corruption are seen as a risk to sound procurement; furthermore, this may be a result of officials abusing power given to them. In addition, in contrast to Question 20, centralisation mechanisms should be designed in ways that do not concentrate too much power, to avoid its being abused.

To the statement, “Corruption is a result of the loopholes in legislation” in question 29 of the questionnaire, a total of 41.25 percent of respondents agree, and 22.50 percent strongly agree, and 23.75 percent disagree, and 6.25 percent strongly disagree. Furthermore, 6.25 percent do not know how to respond to the statement. The statement, “I think fraud is a result of the loopholes in legislation” in question 30 of the questionnaire, results show that 43.75 percent agree and 11.25 percent strongly agree. Furthermore, 33.75 percent disagree and 8.75 percent strongly disagree with the statement. In addition, 2.5 percent do not know how to respond. Responses to these statements are consistent with Munzhedzi (2016: 2) who stated that SCM processes are abused by inflating prices, contracts being awarded to friends or family, tenders not being advertised, bid committees not being properly constituted or that panel members are not declaring their interest before the sitting of the adjudication committee. These instances may be used as an indication of loopholes in legislation that make it easy to abuse positions of authority in the public sector. Furthermore, fraud and corruption may be a result of the fragmented nature of the procurement, as inconsistencies in legislation may not be easily detected. However, respondents that disagree with questions 29 and 30 may not think there are loopholes in legislation. But rather the organisational culture that may be tolerant of fraud and corruption as indicated in question 34 of the questionnaire.

The statement, “I would say that corruption and fraud in procurement disrupt service delivery” in question 31 of the questionnaire, the responses show that almost half 43.75 percent agree and just over half 56.25 percent strongly agree with this statement. This corresponds with the statement by Fourie (2015: 40) that corruption inhibits “the ability of the public sector to achieve its agenda; affects spending on priority sectors such as education and health, and can have a damaging impact on growth”. This shows concern for public sector institutions not achieving the mandate of organisations, as financial resources are not used to deliver services.

The statement, “It is true to say that corruption causes wastage of public funds” (Question 32) in the questionnaire, resulted in 31.25 percent of SCM respondents agreeing and 68.75 percent strongly agreeing that corruption causes wastage of public funds. This is consistent with Rendon and Rendon (2015: 714) who found that in the case of procurement corruption there was an indication of disregard for procurement expenditure and low service delivery, with the misuse of public resources. Inevitably, corruption is a direct cause of wastage of public resources, which is a risk to sound procurement in GPT.

Subsequently, for the statement that, “Fraud causes wastage of public funds” (Question 33), responses indicate that 38.75 percent agree and 62.50 percent strongly agree that fraud

causes wastage of public funds. This is consistent with the statement by Akenbor and Ironkwe (2014: 451) that fraudulent practices have stood as potent weapons capable of "haemorrhaging" the entire economy, particularly the public sector due to high-risk factors associated with fraud.

The statement, "The organisational culture in the public sector is tolerant of fraud and corruption" in question 34 of the questionnaire; results show that 45 percent agree and 17.50 percent strongly agree. Furthermore, 26.25 percent disagree and 5 percent strongly disagree with the statement. While 6.25 percent of the respondents could not answer this question. Agreement to the statement is consistent with a statement by Giriunas and Mackevicius (2014:145) who said that entities committing fraud in the public sector have more incentive and motivation, as well as ability than those in the private sector, due to the intense level of internal controls than exist in the public sector. The incentive and motivation have created a culture that is tolerant of fraud and corruption. In questions 32 and 33 it is shown that the risk of fraud and corruption results in wastage of public funds that were meant for service delivery. Furthermore, the persistence of fraud and corruption could be a result of a culture tolerant of fraud and corruption. However, disagreement to the statement may indicate that some respondents that do not agree that loopholes in legislation results in fraud and corruption as indicated in questions 29 and 30 of the questionnaire.

The statement, "Lack of consequence management encourages corruption" in question 35 which is stated in the questionnaire, indicates that 37.50 percent agree and 42.50 percent strongly agree, 5 percent disagree, and 2.50 percent strongly disagree, while 12.5 percent do not know. Agreement to this statement is consistent with the statement by Giriunas and Mackevicius (2014: 145) that there is more incentive to engage in corruption in the public sector than in the private sector, due to weaker internal controls. This means that tolerance and the lack of consequence management creates a higher incentive for perpetrators, as their actions will not be punished. Responses that disagree with the statement may be due to the perception of the extensive legislative framework in SCM. The extensive legislative framework that respondents perceive not to have loopholes as consistent with questions 29 and 30 of the questionnaire.

4.8 Summary

This chapter has consolidated the quantitative data and presented them in the form of graphs and tables. The aim of the study is to test perceptions, and this was done in the form of a

scaling questionnaire. These data were presented and interpreted by analysis of the feedback from SCM respondents in GPT. The SDS scale indicated that there may have been some bias in the responses of the questionnaires. The main results show that respondents identify the skills shortage to the skills misalignment in SCM rather than the lack of skilled personnel as a risk factor. The results further showed that respondents see decentralisation as a risk to SCM. Respondents see the importance of the office of the AG, however, the AG's limited authority is a risk due to lack of consequence management. Respondents also see fraud and corruption as a risk to SCM, especially service delivery. Furthermore, these inferences were used in order to develop conclusions and recommendations in the next chapter.

CHAPTER 5: CONCLUSIONS

5.1 Introduction

This chapter presents the final conclusions in order to present the outcomes of the study: the research question, objectives and data collected in order to develop recommendations based on the results of the study. These conclusions and recommendations can be used not only by GPT but also by the public sector.

5.2 Limitations and constraints

It is important that the reader takes into consideration the context in which the research was conducted, with regards to the limitations and constraints. The numbers of respondents were restricted by the time constraints, as at the time data was collected officials were finalised end of the year report.

5.3 Achievement of the objectives of the study

5.3.1 Research question

As stated in Chapter 1, the research question is, 'What are the SCM risk factors that are reducing financial efficiency and effectiveness in the GPT?' This is done to examine the risk factors in the implementation of public sector SCM in GPT.

5.3.2 Research objectives

The secondary objectives of the study are:

- To determine the perceptions of the effect of skills shortages on risk in the GPT SCM.
- To determine the perceptions through questionnaires, of the effect that a decentralised procurement system has on the GPT SCM.
- To determine the perceptions through the questionnaire, of the effect that limitations in the authority of the Auditor General have on the GPT SCM.
- To determine the perceptions of the effect that corruption and fraud have on risk in GPT SCM.

The objectives were assessed based on the content in the five chapters that were used to provide guidance for a well aligned study to provide results.

5.3.3 Summary of Results

Chapter 4 provided an analysis of the consolidated data that was collected in the distributed questionnaires. The findings are discussed below.

General demographic information

A total of 71 percent of respondents were in the PSCM branch, as this is the largest business unit that is responsible for SCM in GPT. GPT has a workforce of low work experience, with the majority of officials in the participating business units being at the department for one to six years and less than one year. Most officials either hold a qualification in Accounting or Logistics; only a few specialise in SCM, especially SCM in the public sector.

The following section discusses the findings, followed by the conclusions of each research objective.

Objective one: Skills shortage

- Most GPT officials think that a skills shortage is a risk to sound procurement in GPT. In addition, most GPT officials think that the inefficiencies in procurement are due to a skills shortage in SCM. Officials do hold qualifications; however, these qualifications are not public sector SCM specific.
- GPT officials also see that errors in the application or implementation of public sector SCM can be attributed to limited skills capacity in SCM in GPT.
- Officials think that there is a misalignment in qualification and duties in public sector SCM as most officials do not hold a qualification in public sector SCM.
- Furthermore, the results indicate that there is limited professional association membership, which limits the implementation of sound SCM practices. The professionalisation of public sector SCM could be achieved through professional body membership, to strengthen the accountability of officials practicing SCM in the public sector.

Objective two: Decentralisation

- Most officials see the public sector-procurement system as decentralised; furthermore, as a risk to achieving sound SCM processes.
- In addition, GPT SCM officials indicated that decentralisation of public sector procurement leads to loopholes in the procurement system in GPT.
- Officials also indicated that decentralisation leads to inefficiencies in the SCM system in GPT.
- According to respondents, decentralisation of supply chain processes contributes to increased wastage. On the contrary, the centralisation of supply chain processes is perceived to encourage efficiency in the SCM process. A hybrid model, decentralised and centralised systems, can be used in order to encourage efficiencies in the supply chain system to ensure it operates to its full capacity. In addition, SCM officials think that the CSD is an effective centralisation tool in promoting the efficient application of SCM in GPT.

Objective three: Limitations in authority of the AG

- Officials think that non-compliance to audit recommendations related to SCM is a risk factor for sound procurement in GPT. This is due to the authority of the AG being limited to reporting; this suggests that the continued non-compliance to audit recommendations related to SCM may pose a risk to SCM.
- Most respondents agree that the authority of the AG is limited to reporting, suggesting that the AG has no authority to implement consequence management mechanisms.
- In addition, officials indicated that the AG ensures GPT complies with effective procurement processes. Therefore, the AG assists departments in implementing audit report recommendations; however, in the case of lack of implementation; departments are not penalised.
- SCM officials in GPT agree that recommendations in the AG report ensure effective procurement processes; however, with the lack of implementation, improvement may be minimal.

Objective four: Fraud and corruption

- SCM officials in GPT agree that corruption and fraud are a risk to sound procurement execution in GPT.
- SCM officials also agree that loopholes in legislation are a contributing factor to the presence of fraud and corruption in the SCM value chain.

- In addition, officials think that corruption and fraud in procurement disrupt service delivery, as it is the point of service delivery that requires improvement in order to ensure efficient, effective and economic service delivery.
- Furthermore, the officials think that fraud and corruption cause wastage of public funds.

5.4 Conclusions

Objective one: Skills shortage

The general perception of officials at GPT is that the skills shortage is a risk factor to sound procurement. Officials also think this is exacerbated by the misalignment between job specification and qualification. This means that officials occupying these positions have qualifications; however, these qualifications do not address the supply chain in the public sector. As a result of non-specialised SCM skills, inefficiencies are prevalent in the SCM system. Furthermore, officials agree that the lack of membership in professional bodies may be weakening accountability mechanisms. This is due to professional bodies helping organisations maintain the accountability of professionals who are associated through membership or accreditation.

Objective two: Decentralisation

Officials think that decentralisation is a risk to sound procurement in GPT. The perception is that decentralisation increases the chances for loopholes to appear in the supply chain value chain. Officials also agree that centralisation should be used more in order to reduce the fragmented nature of the public sector procurement system. Furthermore, a more centralised system may assist in improving the regressive wasteful expenditure that happens as a result of decentralisation.

Objective three: Limitations in authority of AG

The recommendations of the AG are effective in tracking organisational health. However, officials indicate that the lack of penalisation from the Chapter 9 Institution may reduce the incentive for public sector organisations to implement recommendations. Furthermore, officials see recommendations as a step in the right directions but think giving the AG more authority may provide for instituting penalties for non-implementation.

Objective four: Fraud and corruption

The surveyed officials see corruption and fraud as a risk to sound procurement in the public sector supply chain. The result of this is wastage of public funds and a lack of service delivery. The officials also think that loopholes in legislation may be one of the reasons the practices

can persist. Furthermore, improving service delivery may require the elimination of the practices.

5.5 Recommendations

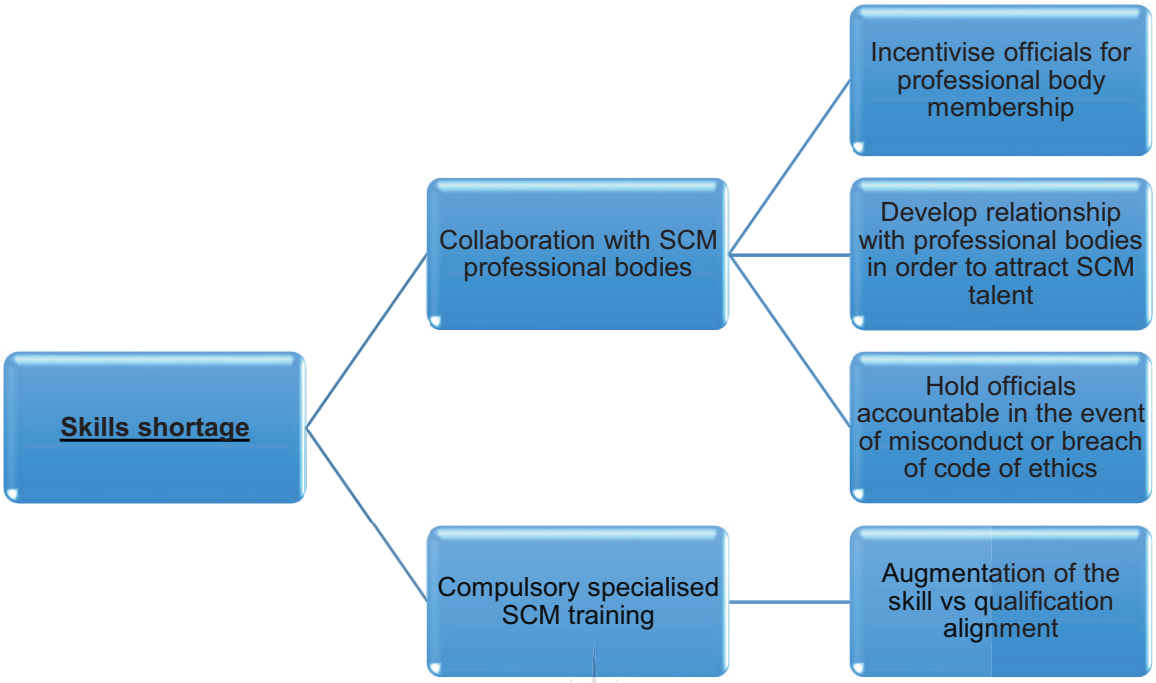
From the previous description, a conclusion can be drawn that the objectives of the study have been achieved. The conclusion is drawn from the results of the study, as well as the recommendations on how the SCM risk factors are reducing efficiency in the department.

Recommendation one: skills shortage

GPT officials operating in SCM hold qualifications in various disciplines, which is compliant with recruitment requirements. However, qualifications are not specialised in SCM. This means that GPT may have to augment skills in strategic SCM as it would be advisable that the department makes SCM specialisation courses compulsory for officials responsible for SCM duties. The National School of Government (NSG) has such courses, which can assist officials to transform public sector SCM into a more strategic function rather than being an administrative operation.

GPT can also incentivise officials that register to be members of professional bodies such as CIPS. However, the organisation still needs to be accredited. This is to encourage SCM employees to register with professional bodies, ensuring professionalisation of public sector SCM. Furthermore, the Department can develop relationships with SCM professional bodies to help the public sector develop SCM best practices as well as to assist with sourcing talent from the best professionals. Figure 5.1 illustrates this recommendation.

Figure 5.1: Recommendation one: skills shortage



Source: Authors own

Figure 5.1 shows the first recommendation concerning the SCM skills shortage. The recommendation focuses on addressing this risk not only internally but also externally to the organisation. Officials that are not in possession of SCM qualifications that are appropriate for their responsibilities may be required to take on training in SCM to augment the skills capacity that already exists. In order to achieve a more strategic SCM in the public sector, training specialising in public sector SCM will be advantageous to the organisation.

Recommendation two: Decentralisation

The fragmented nature of SCM reduces its performance considerably, as the lack of integration increases the chance for errors when processes are implemented. GPT can integrate SCM planning into internal strategic-planning mechanisms. When the executive presents a plan about the vision for achieving the outputs of the department, a detailed strategy that takes into consideration sound SCM practice should be employed. Furthermore, the supply chain system should be integrated from demand, acquisition, logistics management and disposal, through to performance management. The whole process should also be integrated into the business unit that is using the services of SCM. Through collaboration between the two business units, the goods and services procured may meet the required specifications, compared to a decentralised approach. These recommendations may be

applied at GPT; however, it may not be successful if attempts to balance decentralisation with centralisation are not applied throughout the public sector.

Recommendation three: Authority of the AG

The AG has the authority that is guided by the Constitution of the Republic of South Africa. The authority of the AG is limited through audit reports that present recommendations for improving the financial health of public sector organisations. However, the institution is not given the authority to implement punitive measures against public sector organisations that do not implement recommendations. This recommendation can be effectively implemented by the AG or the South African legislature as the role of the AG is policy related when considering the responsibilities of the different government entities and departments. This can be done by giving the AG the authority to withhold the departmental appropriation funds until audit recommendations are implemented or evidence of the process of implementation of audit recommendations. Within GPT, the accounting officer could directly hold managers accountable for non-implementation of audit recommendations as made by the AG.

Recommendation four: Fraud and corruption

With a vast legislative framework that provides a guide to the implementation of sound SCM in the public sector, it may seem as though penalties are not implemented for contravening the framework. GPT may implement consequence management mechanisms more sternly, by criminalising fraud and corruption against the state. To lower the risk caused by fraud and corruption that causes wastage and lack of service delivery in public sector organisations. Loopholes in legislation are a policy problem that cannot be resolved by GPT alone; however, GPT can take care to implement consequence management that can act as a deterrent for officials, members of the public- and private-sector organisations that defraud and conduct corrupt activities against the state.

5.6 Conclusions

As shown in the study, the supply chain in the South African public sector, particularly GPT faces various challenges that pose a risk to its optimal operation. These challenges are mirrored by the perceptions of SCM officials in GPT that experience these challenges in their line of work. GPT needs to develop a process of mitigating the occurrence of these risk factors.

However, in order to mitigate these risks, the department needs to take a comprehensive approach. Without a comprehensive approach, the persistence of other challenges will continue to cause problems in the value chain.

In terms of pursuing future research, a qualitative study may bring to light details regarding the challenges in public sector SCM. Extensive legislation guides officials, yet risk factors persist through various means. Such a qualitative approach may assist the researcher to understand how consequence management can be implemented to improve the performance of public sector SCM. Furthermore, including multiple departments may be useful as this study was limited to one department. The inclusion of multiple departments will help shape a holistic view of the challenges facing provincial governments.

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