

**The evaluation of the perceived effect of internal controls on post trade services in selected financial markets infrastructures**

**NN Kobe**

 **orcid.org 0000-0002-6431-0951**

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Supervisor: Prof. R de Villiers

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Student number: 29807697

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## **ABSTRACT**

Internal controls are processes designed and effected by those charged with governance, management, and other personnel to provide reasonable assurance to achieve of entities' objectives concerning the reliability of the financial reporting, effectiveness and efficiency of operations and compliance with applicable laws and regulations. This Internal control comprises the plan of the enterprise and all of the coordinating methods and measures adopted within a business to safeguard its assets, check the accuracy and reliability of its accounting data, promote operational efficiency, and encourage adherence to prescribed managerial policies. The post trade processes are those processes performed after the execution of a trade by the trading counterparties or the announcement of a corporate action event by an issuer and that these processes play a significant role in the financial sector. AFME (2015) further added that post trade services are an indispensable part of the end-to-end transaction and value chain – enabling as they do the discharge of obligations entered into at trading level and the processing of corporate actions initiated by issuers for the benefit of investors. This study aimed to evaluate the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures. The results of the study play a significant role in assisting managers and businesses as a whole to achieve its goals; hence the need for this study as it has never been performed for the financial markets' infrastructure within a South African context. The data is reliable ( $\alpha=.921$ ), consistent, and not skewed. The results show that the respondents are strongly in agreement that an effective control system exists, the risk assessment is conducted properly, and that a proper control environment exists. Regarding the internal communication and monitoring activities, the respondents marginally agree that these processes are satisfactory. The study then concludes that the latter two processes be improved via assessing and training. The other processes on which the respondents agree, are to be maintained. The study also makes recommendations based on the findings of the study, and the limitations are acknowledged.

**Keywords:** financial markets, infrastructure internal control systems, post trade services.

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## LIST OF ACRONYMS

Acronym	Description
AFME	Association for Financial Markets in Europe
AIA	American Institute of Accountants
AICPA	American Institute of Certified Public Accountants
BRQ	Broad research question
CCP	Central counterparty
COBIT	Control objective for information and related technology
CoCo	Criteria of Control
COSO	Committee of Sponsoring Organisations of the Treadway Commission
CSD	Central securities depository
ESMA	European Securities and Markets Authority
FCPA	Foreign Corrupt Practices Act
FMI	Financial Markets Infrastructure
ICSD	International Central Securities Depositories
ICS	Internal Control Systems
IFAC	International Federation of Accounts
INTOSAI	International Organisation of Supreme Audit Institutions
IOSCO	International Organisation of Securities Commissions
J-SOX	Japan's Financial Instrument and Exchange Law
OTC	Over-the-counter
PFMI	Principles for Financial Markets Infrastructures
PO	Primary research objective
SAS	Statements on Auditing Standards
SO	Secondary objectives
SOX	Sarbanes-Oxley Act
SSS	Securities settlement systems
URL	Universal resource locator

# CHAPTER 1

## INTRODUCTION AND BACKGROUND

### 1. INTRODUCTION AND BACKGROUND

#### 1.1. The concept of internal control

The term internal control was already defined early in the 19<sup>th</sup> century by the American Institute of Accountants [AIA now referred to as American Institute of Certified Public Accountants (AICPA)] in 1949, as follows:

*“Internal control comprises the plan of enterprise and all of the coordinate methods and measures adopted within a business to safeguard its assets, check the accuracy and reliability of its accounting data, promote operational efficiency, and encourage adherence to prescribed managerial policies.”* (Lauren, 2017).

Kirsch (2002), on the other hand, suggest that internal control can be defined as a set of mechanisms designed to motivate an individual or a group towards the achievement of the desired objectives. Cahill (2006) states that internal control is a system of internal administrative efficiency which often leads to the design of a system that will enhance financial check and balance which will support corrective actions intended by the management of the organisation and will ensure the primary goal of the organisation is achieved.

Ejoh and Ejom (2014) further add to the above and states that internal controls refer to the measures instituted by an organisation to ensure attainment of the organisation’s objectives, goals and missions. Ejoh and Ejom (2014) continue to mention that internal controls are a set of policies and procedures adopted by an organisation in ensuring that an organisation’s transactions are processed appropriately to avoid waste, theft and misuse of organisational resources. It is also worth noting that D’Aquila (2013) defines internal controls in the Committee of Sponsoring Organisations of the Treadway Commission (also known as COSO) as: “a process, affected by an organisation’s board of directors, management, and

other personnel, designed to provide reasonable assurance regarding the achievement of objectives relating to operations, reporting, and compliance”.

Furthermore, Ejoh and Ejom (2014) mentioned that internal controls are seen as processes designed and affected by those charged with governance, management, and other personnel to provide reasonable assurance about the achievement of an organisation’s objective with regard to the reliability of the financial reporting, effectiveness and efficiency of operations and compliance with applicable laws and regulations.

From the definitions presented above by COSO, AICPA, Ejoh and Ejom (2014), Kirsch (2002), D’Aquila (2013) and Cahill (2006), it is evident that internal controls comprise of measures put in place by the organisation to ensure the primary goal of the organisation is achieved effectively and efficiently within applicable laws and regulations. The next section elaborates on the history of the internal control system, the role of internal control systems in organisations and the internal control framework.

## 1.2. History of Internal Control System

Table 1.1 below describes the history of internal control systems.

**Table 1.1: History of Internal Control System**

Period	Event Description
1500 - 1905	According to Hackett and Mobley (1976:2) between 1500 and 1850, internal control was used through the development of double-entry accounting. This continued to be used only as a control system for cash transactions until 1905.
1905 – 1930s	Industrial Revolution and ever-growing size of corporations made its mark, especially in the period between 1905 and 1933. Then it became evident that the extent of auditing and testing being done in accounting systems needed to be based on “evaluation of the effectiveness of the system of internal control” (Hackett and Mobley 1976:3).

Period	Event Description
	<p>1929 stock market crash was factored by bad financial reporting practices and a poor quality of audits. The perceived legal liability of the auditors who reviewed systems of internal control of clients sustained rapid development of internal control. (Hackett &amp; Mobley 1976:3-5).</p>
1940 – 1949	<p>In 1940 the word “control” was introduced to what was previously called “internal check”. (Hackett &amp; Mobley 1976:5) This decade also witnessed the development of first internal control definition by the American Institute of Certificated Accountants (AICPA) in 1949. Internal control was defined as “a plan and other coordinated means and ways by the enterprise to keep safe its assets, check the coherency and reliability of data, to increase its effectiveness and to ensure the settled management politics” (Lakis &amp; Giriunas 2012:146).</p>
1949 – 1980s	<p>After 1949, internal control has been continuously updated. Another breakthrough came with the political turmoil of Watergate and the subsequent adoption of the 1977 Foreign Corrupt Practices Act (FCPA). It affected the financial management of companies responsible for internal accounting controls. As Moeller (2011) summarises it “FCPA was a strong set of corporate governance rules, and because of the FCPA, many boards of directors and their audit committees began to review the internal controls in their enterprises actively”. However, despite the adoption of FCPA, there was no unified definition of internal control at the time.</p> <p>To answer the problem, AICPA released a series of Statements on Auditing Standards (SAS) on internal control audit standards in the first half of the 1980s. It standardised the terminology and defined internal control concepts. In the same time, The National Commission on Fraudulent Reporting (called later Treadway Commission) was working on and issued a report that identified</p>

Period	Event Description
	<p>“factors that allowed fraudulent financial reporting” Moeller (2013:52). Those factors were a reason behind enterprise failures, high inflation and high-interest rates that dominated the US economy in 1970s and 1980s.</p>
1990	<p>In 1990 COSO released a draft of COSO framework, which was adjusted and re-released as Internal Control-Integrated framework in 1992. It became a recognised standard for effective internal control. (Moeller 2013:52-53; Hightower 2008:7) The framework was re-released again in 2013 to capulate changes in business and operating environments.</p>
2002 to date	<p>In 2002, the Sarbanes-Oxley Act (SOX) was released as a response to the major corporate and accounting scandals. They resulted in collapses of companies like Enron, WorldCom, Ahold, Parmalat (Lakis &amp; Giriunas 2012:146) and shook investors’ confidence. Creation of this act brought the regulation of financial practice and corporate governance. It had a significant impact on businesses worldwide. Moreover, Section 404 of the law mandates the use of COSO framework in annual evaluations of internal controls implemented in companies. Hence, Hightower (2008:7) mentioned that “Every internal control manual today, refers to the Committee of Sponsoring Organisations of the Treadway Commission (COSO) framework and the Sarbanes-Oxley Act (SOX)”.</p>

**Source:** Own research

Based on the brief history of internal control systems highlighted in table 1.1 above, it is clear that the latter has an important role to play in the ensuring that the organisation can safeguard the organisation’s assets and increase the effectiveness of the control environment to achieve set goals and objectives. The next section focuses on the role of an internal control system in the organisation.

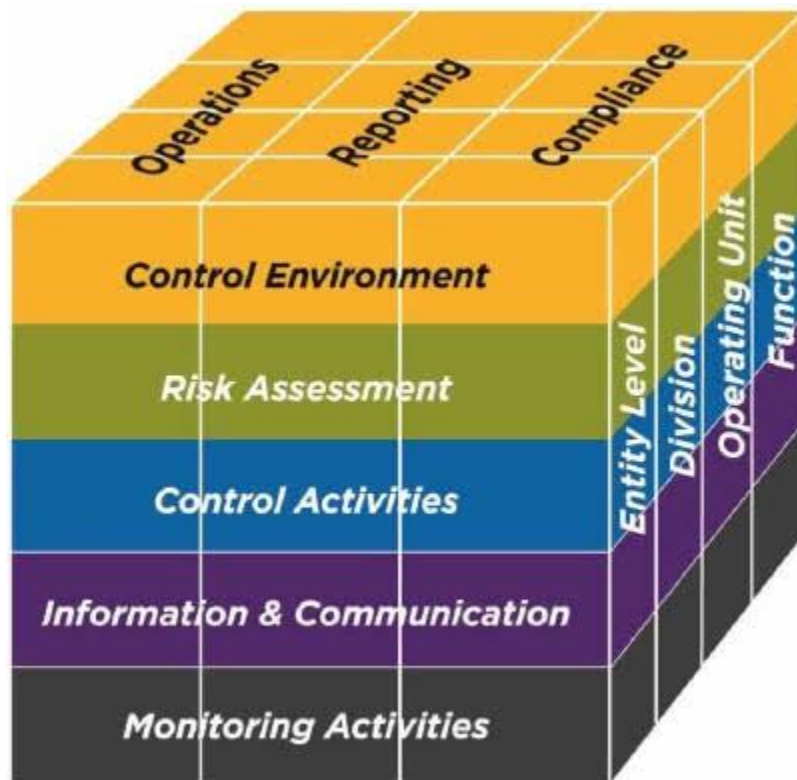
### **1.3. Role of internal control system in the organisation**

COSO (2013), states that the most comprehensive way to understand the role of the internal control system in an organisation is through the internal control framework. It connects the definition and main components of internal control. Therefore, in this research, the role of internal control is represented by the internal control framework developed by COSO (2013). Besides, it is also well developed, being published already in the year 1992 and recently updated in 2013. Hence, the framework provides a holistic knowledge of the internal control system subject.

According to Graham (2015), other known internal control frameworks that exist are the Turnbull Report by The Financial Reporting Council in Britain CoCo (Criteria of Control), the Canadian Institute of Chartered Accountants (CPA Canada), and the J-SOX by Business Accounting Council of the Japanese Financial Services Agency. Graham adds that these models are not so popular worldwide and that they are implemented mostly in their countries of origin. However, their objectives and framework for internal control are typically similar. However, as mentioned previously, in this research, the internal control framework developed by COSO (2013) was used to measure the perceived effect of internal control systems on post trade services in selected financial market infrastructures.

Hayes (2005) states that internal control comprises of five components, (i) the control environment, (ii) the organisation's risk assessment process, (iii) the information and communication systems, (iv) control activities and (v) the monitoring of controls. Refer to figure 1.1 next for the COSO internal control framework, which was used in this study to measure the perceived effect of internal control systems on post trade services in selected financial market infrastructures.

**Figure 1.1: COSO Internal Control Framework**



**Source:** Graham (2015:4)

Figure 1.1 presents the 2013 updated COSO framework and based on the presented figure. Internal control has five main components shown in the rows (Control Environment, Risk Assessment, Control Activities, Information and communication, and Monitoring activities). The Framework provides for three categories of objectives, (namely, operations objectives, reporting objectives and compliance objectives), which allow organisations to focus on different aspects of internal control. They impact on the organisational structure on different levels of an organisation (Entry Level, Operating Unit, Functional level and on Divisional level) This is shown in the figure's third dimension. The COSO framework is elaborated on below in paragraph 1.3.1 to 1.3.3.

### 1.3.1. Objectives of internal control framework

According to COSO (2013), the framework provides for three categories of objectives, which allow organisations to focus on different aspects of internal control. This is discussed by COSO (2013) as follows:

- *Operations objectives* — these pertain to effectiveness and efficiency of the organisation's operations, including operational and financial performance goals, and safeguarding assets against loss.
- *Reporting objectives* — these pertain to internal and external financial and non-financial reporting and may encompass reliability, timeliness, transparency, or other terms as set forth by regulators, recognised standard setters, or the organisation's policies.
- *Compliance objectives* — these pertain to adherence to laws and regulations to which the organisation is subject.

### 1.3.2. Components of internal control

According to COSO (2013), the internal control framework consists of five integrated components. These are conversed by COSO (2013) as follows:

- **Control Environment**

The control environment is the set of standards, processes, and structures that provide the basis for carrying out internal control across the organisation. Graham (2015:5) and Web (2015) states that the control environment talks to the kind of message the management sends to its employees about the importance of internal control.

- **Risk Assessment**

Risk assessment involves a dynamic and iterative process for identifying and assessing risks to the achievement of objectives. Graham (2015:5) and Web (2015) states that risk assessment is performed by management. They exert effort in areas where the risk are most significant; they set up reliable internal controls to manage the risks and deal with common problems employees experience.

- **Control Activities**

Control activities are the actions established through policies and procedures that help ensure that management's directives to mitigate risks to the achievement of objectives are carried out. Graham (2015:5) and Web (2015) states that control activities talks to the actual control activities in operation. This can be, for example, the authorization of transactions and the segregation of duties.

- **Information and Communication**

Information is necessary for the organisation to carry out internal control responsibilities to support the achievement of its objectives. Communication is the continual, iterative process of providing, sharing, and obtaining the necessary information. Graham (2015:5) and Web (2015) states that information and communication talks to how are the results and to whom are the results communicated in the organisation. How do departments communicate with one another? Is this relevant to internal communication (within the organisation), or also to external communication?

- **Monitoring Activities**

Ongoing evaluations, separate evaluations, or some combination of the two are used to ascertain whether each of the five components of internal control, including controls to affect the principles within each component, are present and functioning. Graham (2015:5) and Web (2015) states that monitoring talks to how are the controls monitored by management; regular monitoring to uncover issues and ensure that the problem is communicated, and solutions are found; an answer to dynamically changing environment.

### **1.3.3. The organisation's organisational structure**

According to Uzun (2009:3), the third dimension of an internal control framework represents the business environment in which the organisation operates, and this dimension creates an opportunity for effective internal control implementation. Risks are identified bearing the organisation's financial, operational and also strategic objectives in mind and plays a significant role to determine what the design of the control activities should encompass.

The communication and monitoring of information also helps in the assessment and review of the efficiency of control activities.

According to COSO (2013), an internal control system's role is to help entities achieve essential objectives and sustain an improved performance. Thus, the framework enables organisations to effectively and efficiently develop systems of internal control that adapt to changing business and operating environments, mitigate risks to acceptable levels, and support sound decision making and governance of the organisation. The key benefits of implementing internal controls increase the efficiency of operations and management of risks, and here management is also supported by (Uzun, 2009:4-6):

- “Applying standardised procedures, rules, and regulations;
- Securing the organisation's current assets;
- Providing reliable financial reporting;
- Ensuring compliance with laws and regulations;
- Elimination of income or resource losses;
- Goal-oriented and accurate decision making; and
- Identification and prevention of fraud.”

On the other hand, (Mosher, 2009) believes that “inadequate internal control systems would be an impediment that slows down the company. It is important that during the development of internal controls, such controls are designed to respond to specific and primary risks.” It must also be cost-efficient and comprehensive, as well as consistent and well understood by all employees (Mosher, 2009).

In the paragraphs to follow (par. 1.4, 1.5 and 1.6), post trade services and its role within the financial market landscape is discussed.

#### **1.4. Post trade services and the role within the financial market landscape**

According to Mai (2005), post trading refers to the activities that take place after an exchange of securities has been agreed upon. This includes clearing and settlement. Clearing and settlement is the term used to describe the processes and the infrastructures required to finalise a transaction. These processes enable:

- The transfer of ownership of the securities from the seller to the buyer; and
- The transfer of the payment from the buyer to the seller.

Mai (2005) further asserts that post trade services are required after two parties have decided to transfer ownership of a security. Mai (2005) also mentions that post trade services normally handle the execution of a trade i.e., “realising the transfer of ownership of a security from one party to another, and the transfer of cash as payment for the security”. Meanwhile, Ferrarini and Saguato (2015) believe that post trade services are offered either directly by exchanges or by organisations linked to them, such as clearing and settlement agents and central securities depositories, which enable the settlement of exchange transactions and make them securer. Also, Ferrarini and Saguato (2015), mentions that each post trading service is intended at reducing or more generally managing a separate facet of systemic risk. Mai (2005) further added that the necessity for post trade services result from after any trade, regardless of whether the parties trade over an exchange or over-the-counter and whether the deal involves local or international securities.

According to AFME (2015), which is the voice of all Europe’s wholesale financial markets providing expertise across a broad range of regulatory and capital markets issues, posited that post trade processes comprise the services performed after the trade has been executed. Therefore:

- “Post trade services form an integral part in discharging obligations entered into at trading level”; and
- “Post trade service providers process the corporate actions initiated by issuers for the benefit of investors.”

According to the European Commission (2015), efficient and safe post trade infrastructures are a key element of a well-functioning financial market. If they don't work correctly, investors face more risks and higher costs.

Figure 1.2 below depicts the overview of the post trade functions. It describes five distinct functions of post trade services, i.e. securities: clearing, settlement, custody, safekeeping, and the notary function (Mai, 2005).

While different financial market infrastructures provide one or more of the services associated with these functions, these five functions exhaustively describe the scope of post trade activities both in a domestic and in a cross-border context. In this study, the focus will be on post trade services. In paragraph 1.4.1 to 1.4.6, each element of the post trade services is explained (as depicted in figure 1.2 below).

**Figure 1.2: Overview of post trade functions**

Trading functions		Post trade functions				
Trading	Risk taking	Clearing	Settlement	Custody	Safekeeping	Notary

**Source:** Mai (2005) - adapted

### 1.4.1. Trading

AFME (2015) mentioned that trading is the activity of buying and selling securities or other financial instruments. At the same time, Mai (2005) noted that a trade is “a contract that establishes an obligation for a seller to deliver securities against cash and for a buyer to pay cash to receive securities. A trade is a contract that establishes an obligation for a seller to deliver securities against cash, and for a buyer to pay cash to receive securities”.

## **1.4.2. Clearing**

Li and Marinč (2016:137) mentioned that clearing is the process in which the buyer of a security and its seller establish their respective obligations. Mai (2005) also noted that the clearing function provides the connection between trading and settlement. Besides, clearing services include the validation of trades and the preparation of the settlement process, that is the enhancement of trades with the information required for settlement (for example, settlement date, securities identification codes, settlement venue), as well as the authentication of the existence of adequate funds and securities. Clearing ensures that all of the prerequisites for the settlement process are in place. Meanwhile, AFME (2015) mentioned that following the trade, the process of clearing manages the actions between trade date and settlement date. Mai (2005), further, adds that “the clearing function provides the connection between trading and settlement. Clearing services thus comprise the authentication of trades and the preparation of the settlement process.”

### **1.4.3. Settlement**

Mai (2005) describes the settlement as the effective transfer of ownership of securities from a seller to a buyer, and the particular transfer of cash from a buyer to a seller. This is also supported by AFME (2015) by suggesting that settlement is the step in the post trade process flow where the buyer receives the purchased securities, and the seller receives the corresponding cash for those securities. Li and Marinč (2016:138) add that “settlement implies the transfer of money from the buyer to the seller, and simultaneous delivery of the securities from the seller to the buyer”.

### **1.4.4. Custody**

Besta (2017) noted that “custody relates to all those services, including account keeping and administration of securities on behalf of customers.” While Mai (2005), noted that “the custody function comprises customer account keeping of securities on behalf of customers. It deals with ongoing services for securities owners, for example, capital increases, redemptions, or the collection of dividends and interest”.

### **1.4.5. Safekeeping**

According to Mai (2005), safeguarding function refers to securities evidenced by physical certificates that need to be stored in a safe place. In the case of a dematerialised issue (i.e. share certificate gets converted to electronic format, securities are no longer stored physically).

### **1.4.6. Notary**

According to Mai (2005):

*“the notary function is the starting point for an issuer into the securities post trade domain. It confirms whether securities fulfil specific technical and formal requirements to be eligible for post trade services”.*

After the above discussion on post trade functions, the next section turns the attention to the providers of post trade services.

## **1.5. Providers of post trade services**

According to Mai (2005), the main types of institutions active in the post trade market are:

- agent banks/custodians;
- international central securities depositories;
- central securities depositories (CSD) common depositories; and
- registrars.

In the next section, the importance of internal controls, specifically on the post trade services, are discussed.

## **1.6. Internal controls and post trade services**

A study conducted by the European Post Trading Forum (2016) concluded that the recent regulatory reforms are forcing the evolution of the post trading services in many areas which include amongst others: (1) controls and monitoring over implementation, (2) enhanced, more stringent supervision. Collet (2012), mentioned that “although often referred to as the plumbing of the financial markets, post trading activities are crucial in providing vital linkages to guarantee a smooth and safe execution of a financial transaction along with the different steps of the value chain.” Collet (2012) also mentioned that, while often described as the plumbing of the securities market, the post trade infrastructures are nevertheless paramount activities provided by Central Securities Depositories and/or Central Counterparties to ensure the efficiency, risk mitigation and the safety of the clearing and settlement of securities transactions.

In addition, Mack (2018) argues that regulators worldwide have imposed more stringent reporting requirements and demand greater transparency and access to data. To meet these requirements, many firms have added participants to their post trade and compliance groups. But these functions remain predominantly manual (Mack, 2018). To comply with regulations, firms need to maintain and process large amounts of risk-related data. Mack (2018) further adds that there are two harmful consequences. Firstly, there is uncertainty at the close of the trading day about the status of transactions, and secondly, there is a

susceptibility to errors caused by manual matching which still dominates post trade operations for most asset classes.

AFME (2015) mentioned that “one of the crucial steps in the post trade process flow is the settlement – whereby, after a trade has been carried out, the buyer receives the purchased securities. The seller receives the corresponding cash in exchange for those securities.” AFME (2015) further added that settlement occurs typically two or three business days after trade date to allow for a certain number of processing steps to happen. This is to ensure a high degree of control and efficiency, which is required for the processing of high volumes and values of securities transactions. The integrity of securities issues and minimise risks arising out of safekeeping, and transfer of securities is ensured by the central securities depositories who have adopted stringent control measures which includes the double-entry mechanism of bookkeeping, internal and external reconciliation (AFME, 2015).

From the arguments of the AFME (2015), European Post Trading Forum (2016), Collet (2012) and Mack (2018), it is evident that to process volumes and values of securities transactions within the post trade environment, a much higher degree of control measures and efficiency are required as well as monitoring over such implementation. The researcher puts that post trading activities are crucial in providing vital linkages to guarantee a smooth and safe execution of a financial transaction along with the different steps of the value chain. However, based on the vast amount of literature reviewed, it seems as if a study evaluating the perceived effect of internal control systems on post trade services in selected financial market infrastructures has yet to be performed, specifically in a South African context, and it is imperative that the internal controls at the post trade services function effectively.

## **1.7. PROBLEM STATEMENT AND MOTIVATION**

According to AFME (2015), post trade processes are those processes performed after the completion of a trade by the trading counterparties or the announcement of a corporate action event by an issuer and play a significant role in the financial sector. AFME (2015) further adds that post trade services are an indispensable part of the end-to-end transaction and value chain – enabling as they do the discharge of obligations entered into at trading level and the processing of corporate actions initiated by issuers for the benefit of investors.

Furthermore, it has been established by Mai (2005) that post trade services providers perform an essential role in reducing the credit, market, and liquidity risks of market participants. In addition to this, AFME (2015) and the European Post Trading Forum (2016), suggested that to process volumes and values of securities transactions within the post trade environment, a much higher degree of control measures and efficiency are required as well as monitoring over such implementation. This point is also supported by Collet (2012) who noted that “although often referred to as the plumbing of the financial markets, post trading activities are crucial in providing vital linkages to guarantee a smooth and safe execution of a financial transaction along with the different steps of the value chain.”

A number of studies have been conducted in the past which focused on how internal control affected the financial performance of companies, how internal control systems influenced organisations, as well as, the role of internal control activities on financial performance (Kinyua, 2015), (Ndiwa, 2014) and (Ndifon, 2014). Table 1.2 indicates the purpose and results of some of the several studies performed on the latter phenomenon:

**Table 1.2: The purpose and results of studies conducted in the past**

Researcher(s)	Purpose of the Study	Results
Kinyua (2015)	The study analysed how the financial performance of Nairobi Securities Exchange companies were affected by the internal control environment.	The findings of the study revealed the existence of a positive relationship between financial performance and internal control environment.
<u>Ndiwa</u> (2014)	The study investigated how the financial performance of the African Institute of Research and Development Studies was influenced by internal control	The study established that these institutions had adequate resources but weak financial performance leading to the closure of some of them. The

Researcher(s)	Purpose of the Study	Results
	of Research and Development Studies campuses only.	audit department did not have adequate participants. The study established the existence of a positive relationship between financial performance and internal control.
Ndifon (2014)	The study investigated the role of internal control activities on the financial performance in tertiary institutions in Nigeria. The study was performed at Cross River State College of Education, Akamkpa.	The findings of the study indicated that all the control activities in the institution were spearheaded by the management. In addition, there was a separation of duties among the employees in the finance department, and there was consistent supervision of work by the superiors.
Mwakimasinde <i>et al.</i> (2014)	The study examined how the financial performance of sugarcane out-grower companies in Kenya was influenced by internal control systems.	The regression findings that the study showed a statistically significant relationship between financial performance and internal control systems.
Anas (2015)	The study investigated the impact of internal control system on financial performance in Mogadishu Private Banks.	The findings of the study revealed that the majority of the private banks in Mogadishu have enough cash to meet their intended goals and that there is a clear separation of duties. The study also suggests that the

Researcher(s)	Purpose of the Study	Results
		internal auditors perform their duties fast, efficient and reliable.
Kamau (2014)	The study explored how financial performances of manufacturing firms in Kenya were affected by internal controls.	The study found out that most of the companies had proper control environment which positively influenced their financial performance, the participants of the companies under study were well trained on financial management systems, and the organisations had security systems to protect their assets and prevent fraud.
Palfi and Muresan (2009)	The study investigated the significance of proper internal control system in the baking industry.	The study findings showed teamwork between the management and internal audit department through regular meetings.
Nyakundi <i>et al.</i> (2014)	The study performed an investigation on the effect of the internal control system on the financial performance of small and medium scale business enterprises in Kisumu city, Kenya.	The result of the analyses revealed a significant change in the financial performance of small and medium scale enterprises which is linked to the existence of an internal control system.

**Source:** Kenya National Bureau of Statistics (2015)

It is clear from table 1.2 that these studies considered the role of the internal control system and its influence within organisations. However, none of the studies considered the

perceived effect of the internal controls systems on post trade services in selected financial market infrastructures.

Resultantly, a study of this nature is imperative because a clear gap exists in the literature of this field. Such a study would assist in contributing to the body of knowledge and provides feedback on the perceived effect of the internal controls systems on the post trade services in selected financial market infrastructures. The recommendations of the study can be of interest to the management of financial markets infrastructures which would be interested in coming up with various ways in which to improve their efficiency and effectiveness through the use of proper internal control system in all their operations. Ultimately, the findings identified from this study can assist academics that are interested in the field to carry out further research in the field and may shed some light on this for the financial markets' infrastructures.

In response to the global financial crisis, the Committee on Payments and Settlement Systems of the BIS and the Technical Committee of the International Organisation of Securities Commissions IOSCO (2012) published the Principles for Financial Markets Infrastructures (PFMI), international standards for the oversight and supervision of systemically important payment systems, central securities depositories and securities settlement systems, central counterparties and trade repositories. The PFMI aims to strengthen the resilience of financial markets infrastructures in case of wide-scale crises.

This study plays a significant role in assisting managers and businesses as a whole to achieve its goals, hence the need for this study as it has never been performed for financial markets infrastructure.

Based on the vast amount of literature reviewed, it seems as if a study evaluating the perceived effect of internal control systems on post trade services in selected financial market infrastructures has yet to be performed, specifically in a South African context, although the internal controls at the post trade services must function effectively.

## **1.8. RESEARCH QUESTION**

The broad research question (BRQ) below emerges as a result of the evaluation of the perceived effect of the internal controls systems on the post trade services in selected financial markets infrastructures. The question was further expanded to reflect the more specific questions which can assist in achieving the overall objective of this study.

*BRQ: Are the internal controls systems employed in selected financial markets infrastructures perceived to have an effect on post trade services?*

## **1.9. RESEARCH OBJECTIVES**

### **1.9.1. Primary objective**

The primary research objective (PO) of this study is to:

*PO1: Evaluate the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures.*

### **1.9.2. Secondary objectives**

The following secondary objectives (SO) were formulated to achieve the PO1:

*SO1: Defining the internal control system and financial markets infrastructures*

*SO2: Identify, assess and examine the role and importance of internal control system, post trade services and the principles of financial markets infrastructures*

*SO3: Identify the research methodology to be applied in this study.*

*SO4: Evaluate the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures through analysis of the acquired results.*

*SO5: Formulate recommendations as to the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures.*

## **1.10. SCOPE OF THE STUDY**

This study focuses on assessing the perceived effect of the internal controls systems on the post trade services in selected financial markets infrastructures. Thus, the researcher concentrates on internal control systems of selected financial market infrastructures to assess the effect on post trade services.

The conceptual scope of this study lies on the effect of internal control systems on the post trade services in selected financial markets infrastructures. The specific context of interest is financial market infrastructures providing post trade services in South Africa. The participants of these institutions in the post trade services department were asked through a questionnaire to be involved since they have the knowledge and would provide information on finance reports in relation to the internal control system of post trade services. It is believed that this would provide adequate information for the study and therefore give reliable results and findings.

## **1.11. RESEARCH METHODOLOGY**

### **1.11.1. Literature review**

A literature review is simply a summary of what existing scholarship knows about a particular topic. It is always based on secondary sources – that is, what other researchers and scholars have already written on the subject; it is not concerned about discovering new knowledge or information per se. As such, it could be seen as a prelude to further research, a digest of scholarly opinion (Kent, 2019). The literature sources utilised in this study include, amongst others, academic journals, books, published theses and dissertations, electronic articles, published annual financial statements, applicable legislation and regulations, and the King reports.

The literature review addresses secondary objective 1 to 3, as indicated in Chapter 1, par. 1.9.2.

### **1.11.2. Empirical research**

In addressing secondary objective 4 to 5, as indicated in Chapter 1, par. 1.9.2, the empirical study was conducted as follows:

### **1.11.3. Research tool**

According to Burns and Grove (2003:57), secondary information should always be sought first, since it is much cheaper and faster to collect than primary information. On the other hand, Malhotra (2010:132), define primary data as the data that is intended to solve the problem or make use of the opportunity specifically.

In this study, both primary and secondary sources were used to collect quantitative data. These sources of information were used to explore and to become familiar with the research problem through the use of questionnaires, financial statements, textbooks and reliable academic research articles.

### **1.11.4. Research method**

Burns and Grove (2003:368) state that a quantitative research method is used to quantify the problem by way of generating numerical data or data that can be transformed into useful statistics. It is used to quantify attitudes, opinions, behaviours, and other defined variables – and generalise results from a larger sample population if possible. Burns and Grove (2003:368) further add that quantitative research uses measurable data to formulate facts and uncover patterns in research. Quantitative approaches were used to fulfil the objectives of the study.

In this study, information was collected through self-administered questionnaires using the automated research tool Survey Monkey. The researcher sent the link to the completion of the questionnaire on Survey Monkey via email to the participants. The questionnaire consists

of two parts. Part 1 contains the participants' demographical information. Part 2 contains five sections that deals with internal control as per the COSO framework. Each of the sections has its own unique questions relevant to internal control that the respondents answered to indicate if their organisation do implement any elements to control risk. The data is obtained from appropriate participants of the post trade services based on relevance. The available data was transformed into a pattern that fits and addresses the research objectives.

Quantitative, numerical data were collected and analysed to determine the perception of selected participants from junior level to senior management and determine the effects of the internal controls systems on post trade services in selected financial markets infrastructures. This research utilised a cross-sectional field survey to collect the data used for the empirical analysis in the study.

#### **1.11.5. Study population**

Kombo and Tromp (2011) define a population as a group of individuals, objects or items from which samples are taken for measurement. The population of a study is the collection of all possible individuals, objects or frequencies of interest. In this study, the population focused on participants from junior level to senior management level in selected financial market infrastructure, especially those with exposure to dealing with internal control systems in post trade services.

#### **1.11.6. Sample**

Polit and Beck (2012) mentioned that a sample is a portion of the target population selected to participate in the research study. Also, the essence of sampling is that it should maximise representativity of the selected population and to allow for generalisation to be as accurate as possible. The total number of employees employed at the selected financial market infrastructure within the post trade services department, which makes up the population of this study is 37 employees. The research plan selected the top, middle, lower-level management, and employees because they are the custodian of the internal control system. A questionnaire was sent to all participants in the department to fulfil the objectives of this study.

## 1.12. ETHICAL CONSIDERATIONS

Ethics is a branch of philosophy that deals with the conduct of people and guides the norms or standards of behaviour of people and relationships with each other (Blumberg *et al.*, 2005). It refers to an “ethos” or “way of life”, “social norms for conduct that distinguishes between acceptable and unacceptable behaviour” Shah (2011:205); Akaranga and Ongong’a (2013:8). Ethics are the moral principles that govern a person’s behaviour. Research ethics may be referred to as doing what is morally and legally right in research. They are actually norms for conduct that distinguish between right and wrong, and acceptable and unacceptable behaviour. Ethics are central to the research process. Researchers need to take care of various ethical issues at different levels of this process. The reality is there can be ethical concerns at every step of the research process Bickman and Rog (2009). Besides, ethical considerations have been gaining paramount importance across the research community. With an increase in the public concern about the limits of the inquiry and legislative changes in human rights and data protection, the ethical considerations have come to the forefront in social research. With the advent of technology, more and more ethical issues have been arising in the field of communication research Bickman and Rog (2009).

According to Du Plooy-Cilliers *et al.* (2014:190), Leedy and Ormrod (2012:104-108) and Wagner *et al.* (2012:88), ethical issues fall into four categories with which the study and the research comply with and are outlined below as follows in table 1.3:

**Table 1.3: Ethical issues**

Category	Researcher's responsibility
Protection from harm	The researcher ensured that the participants endured no physical or psychological harm. The participants were not subjected to strenuous or embarrassing situations. The tone of the interview was of such a nature as not to offend the participants. The interview itself was conducted in solitude, and the researcher inquired on regular intervals if the participants were comfortable.
Voluntary and informed participation	The participants were approached and requested to participate only voluntarily. They were informed of the scope of the research to make a calculated decision to participate. Nobody was forced to participate in this study, and the participants were made aware that they could discontinue their participation at any stage.
Right to privacy	The identity of the participants was kept anonymous and the information shared by them is kept confidential. Their responses were presented anonymously in the dissertation.
Honesty with professional colleagues	Participants in the research were informed of the processes to be followed and the purpose of this research. All the participants were treated equally.

**Source:** Du Plooy-Cilliers *et al.* (2014:190), Leedy and Ormrod (2012:104-108), and Wagner *et al.* (2012:88).

In executing this study, acceptable behaviour and ethical standards were adhered to. Any correspondence were treated with utmost respect required, the information will not be shared without the consent of the participants, administered the questionnaire professionally and ethically, participants were informed beforehand that their participation is voluntary, and that they could opt-out at any time. In conducting this research, the researcher subscribed to the rules of the NWU Institutional Research Ethics; all applicable policies of the NWU as well as

all national and international laws and regulations applicable to the researchers field of study. Furthermore, the researcher committed to abide by the ethical principles and responsibilities as set out in the Singapore statement on Research Integrity (22 September 2010). The approved ethics number provided by North West University to the researcher is NWU-01342-19-A4.

### **1.13. RESEARCH STRUCTURE**

The study consists of five different chapters:

#### **Chapter 1: Introduction and background**

This chapter argues about the perceived effect that internal control system has on post trade services within selected financial market infrastructures. The chapter outlines limited studies performed to determine the perceived effect that internal control system has on the post trade services within selected financial markets infrastructures. As a result of the lack of studies performed in the past, this formed the motivation of the study on which the problem statement was based on. This chapter addresses the primary objective as set out in Chapter 1, par. 1.9.1.

#### **Chapter 2: Literature review**

This chapter addresses secondary research objective 1 and 2, as set out in Chapter 1, par. 1.9.2. This chapter provides an overview of the internal controls system and financial markets infrastructures. In addition, this chapter presents the history, role and framework of the internal control system. This chapter is followed by chapter three, which discusses the research methodology.

#### **Chapter 3: Research methodology**

The purpose of the chapter is to identify the research methodology to support secondary research objective 3, defined in Chapter 1, par. 1.9.2. This chapter outlines the research design followed for this study, the type of research design used in the study and how it will

be detailed. Also, the sample and research methodology are described. The chapter also explains the data collection and statistical analysis selected in this study in detail.

#### **Chapter 4: Research findings**

This chapter contains the detailed presentation of the empirical results. This chapter, therefore, addresses secondary research objective 4, as set out in Chapter 1, par. 1.9.2.

#### **Chapter 5: Conclusions and recommendations**

This final chapter concludes the study and addresses the research objectives. Recommendation based on the research findings, and also suggestions for future research are made to address the secondary research objectives 5, as set out in Chapter 1, par. 1.9.2.

## 1.14. CHAPTER SUMMARY

This chapter commenced by introducing the concept of internal controls where it was highlighted that internal controls comprise of measures put in place by the organisation to ensure the primary goal of the organisation is achieved effectively and efficiently within applicable laws and regulations. The history of internal control systems was also described from the year 1500 to date. From the history described, it is clear that the internal control systems have an important role to play in ensuring that the organisation can safeguard assets and increase its effectiveness of control environment to achieve set goals and objectives.

The researcher also discussed the role of internal controls in the organisation wherein the internal control framework developed by COSO was presented for a better understanding of the framework. This COSO, internal control framework, is used in this study to measure the perceived effect of internal control systems on post trade services in selected financial market infrastructures. The objectives and components of the internal control framework were also discussed in the chapter.

Post trade services and their role within financial markets landscape was also discussed in the chapter. It was discovered that the post trade services arise after any trade, regardless of whether the parties trade over an exchange or over-the-counter and whether the trade involves domestic or international securities. The overview of post trade functions was also presented, and we also learned about the functions involved in the post trade process. This function includes trading, clearing, settlement, custody and safeguarding and notary. This was followed by a discussion of internal controls and post trader services where it was learned that in order to process volumes and values of securities transactions within the post trade environment, a much higher degree of control measures and efficiency are required as well as monitoring over such implementation. It is put by the researcher that post trading activities are crucial in providing vital linkages to guarantee a smooth and safe execution of a financial transaction along with the different steps of the value chain.

This chapter also presented the problem statement and motivation after looking at studies and literature conducted in the past. The problem statement for this study is based on the vast amount of literature reviewed. It seems as if a study evaluating the perceived effect of internal control systems on post trade services in selected financial market infrastructures has yet to be performed, specifically in a South African context, although it is clearly imperative that the internal controls at the post trade services function effectively. This was followed by the presentation of the research question and the research objectives for the study. The broad research question being asked in the study is *“Are the internal controls systems employed in selected financial markets infrastructures perceived to have an effect on post trade services?”* The primary objective of the study is then to *“evaluate the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures”*.

The scope of the study was also discussed in the chapter. The scope highlights that the study focuses on assessing the perceived effect of the internal controls systems on the post trade services in selected financial markets infrastructures. Thus, the researcher concentrates on internal control systems of selected financial market infrastructures, so as to assess the effect on post trade services. The specific context of interest is financial market infrastructures providing post trade services in South Africa. This chapter also described the research methodology that was followed during the study. The ethical standards adhered to in the study were also outlined in terms of the behaviour that is acceptable and exercised by the researcher. Finally, the research structure is presented outlining the five chapters composed in the study.

The next chapter explores and discusses relevant literature research concerning the effects of internal control systems on financial markets infrastructures in an attempt to address SO 2.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1. INTRODUCTION

The purpose of this study is to establish whether internal control systems (ICS) in selected financial market infrastructures are perceived to affect post trade services. The previous chapter discussed the perceived effect that ICS has on the post trade services within selected financial markets infrastructures. As a result of the lack of studies performed in the past, this formed the motivation of the study on which the problem statement was based on. This chapter aims to address the next two secondary objectives in the study (see chapter one, paragraph 1.9.2).

*SO1: Define internal control system and financial markets infrastructures internal control system*

*SO2: Identify, assess and examine the role and importance of internal control system, post trade services and the principles of financial markets infrastructures*

The literature review begins by defining what an ICS is and its significance to achieve these two objectives above. The literature then proceeds by describing the process and the types of ICS. This chapter also discusses the role of post trade services and relationship with internal controls. The literature also points out management responsibilities concerning ICS. The literature concludes by providing an overview and principles of financial market infrastructures.

#### 2.2. DEFINING INTERNAL CONTROL SYSTEMS

INTOSAI (2004) defines ICS as an essential process that is affected by the management and employees of an organisation and it is intended to address threats and to provide reasonable assurance that in quest of the organisation's mission, with general objectives of performing orderly, ethical, economically effective and efficient operation, fulfilling

accountability obligation, conforming with relevant laws and regulations while safeguarding resources against misuse and loss. Furthermore, INTOSAI (2004) states that internal control (IC) requires the commitment of management and employees at all levels to involve and address risks and simultaneously provide satisfactory assurance of the achievement of organisation's mission and objectives. IC is a dynamic and important process that adapts continuously to the changes that organisations face daily.

Cook *et al.* (1980) noted that ICS are generally defined as a System which has the features of:

- Maintaining the assets of a company,
- Ensuring accuracy and reliability of information,
- Reports related to accounting and other operations,
- Increasing the effectiveness of the operations.

Cook and colleagues (1980) stated further that the system also covers all assessment and methods that are adopted to detect the suitability of operations following the policies determined by management, implementing a chart of accounts and reporting system, specifying the duties, authority and responsibilities and organisation plan of the cooperation.

Chatfield and Vangermeersch (2014) defined ICS as the plan of organisation and all the methods and procedures adopted by the management of an organisation to help in achieving management objectives. Also ensuring as far as practicable, the efficient and orderly conduct of its business. And lastly, adherence to management policies, the safeguarding of assets, prevention and detection of fraud and error, the accuracy and completeness of records and the timely preparation of reliable financial information. While Doyrangöl (2017) suggest that an ICS which is created and implemented by management and employees is a process which is designed to ensure reasonable assurance to achieve their pre-specified objectives.

The Control Objective for Information and Related Technology (COBIT, 2007) also defined ICS as “a process including procedures, norms, performance and organisational structure established to ensure reasonable guarantees.” This, in turn, achieves the established business goals, avoids undesirable events, or identifies events so that it can be prevented

or fixed. Even though the conception of IC is defined differently, the core point remains the same in all frameworks, that is, the definition as an IC is the inspection, observation, maintenance and regulation of organisation work for the achievement of objectives.

COSO (2013) integrated framework<sup>1</sup> states that IC helps organisation to achieve important objectives and sustain and improve performance. Uket and Joseph (2012) and Eniola and Akinselure (2016) added that a sound of ICS could help the organisations to prevent frauds, errors and minimise wastage. Verschoor (1999) noted that ICS not only contribute to managerial effectiveness but are also important duties of the corporate boards of directors.

Essentially as stated by Beasley (2010) and also by Emasu (2010), a system of IC consists of policies and measures considered to provide management with representative assurance that the organisation achieves its goals and objects. These procedures and policies are frequently called controls; collectively, they make up the organisation's IC. ICS are set up by the organisation to aid them in meeting their objectives, ensure generation of reliable financial reports, increase organisational compliance to financial regulations as well as prevent loss of organisational resources. Hence, the International Federation of Accountants (IFAC, 2012) mentioned that best-performing organisations are knowledgeable and they can take advantage of opportunities or avert threats by effectively applying the internal controls.

Therefore, it can be summarised based on the definitions above that ICS is a process affected by management and employees aimed at ensuring the achievement of organisations goals and objectives. Moreover, the organisation needs to have the know how to take advantage of opportunities and prevent threats through effective application of internal controls. The following section discusses the ICS process and various elements involved in the process to have an effective ICS.

### **2.3. INTERNAL CONTROL SYSTEMS PROCESS**

COSO (2013) stated that “the five elements of IC that need to be employed and incorporated into the business procedures to ensure that the overall business goals and objectives are

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<sup>1</sup> COSO integrated framework “enables organisations to effectively and efficiently develop system of internal control that adapt to changing business and operating environment, mitigate risks to acceptable level and support decision making and governance of organisation.”

met and must be integrated into the management process. The five elements are control environment, risk assessment, control activities, information and communication and monitoring activities.”

### **2.3.1. Control environment**

Naciri (2009) noted that the control environment sets the tone for the organisation and determines how the employees are conducting activities and how they exercise their control responsibilities. The control environment serves as basis for all the other components of IC because it provides the structure and also the discipline (COSO, 2013). Furthermore, COSO (2013) mentioned that effective control “must incorporate integrity and ethical values, commitment to competence, management philosophy and operating style, organisational culture, attention and oversight by directors or audit committee with the objective of good governance and adequate financial reporting.”

In addition, COSO (2013), further added to the above assertions to state that, control environmental factors and these include ethical values, integrity, and proficiency of an organisation’s personnel, its management’s philosophy and operating style, the manner in which management allocates responsibility and authority, how it organises and develops its personnel, and the board of directors’ direction and attention. Mawanda (2008) also conceded to state that factors such as integrity, ethical values, commitment and competence influences the control environment. It also constitutes a control consciousness at management and all the personnel to perform their duties that were assigned to them. While Mohammed *et al.* (2017:687) mentioned that an effective control environment is one where competent people know what their responsibilities are, know the limits of their authority, while they are mindful, knowledgeable, and committed to follow the organisation’s policies and procedures and uphold its behavioural and ethical standards. The control environment encompasses technical competence and ethical commitment.

In summary, based on the above literature that control environment essentially stems from the tone, culture and discipline set in the organisation which feeds the entire organisation. Traits such as integrity, ethics, values, competence and management philosophy are essential in instilling an effective control environment.

### **2.3.2. Risk assessment**

According to Naciri (2009), risk assessment is the “identification and analysis of risks associated with the achievement of operations, financial reporting, and compliance goals and objectives.” Furthermore, risk assessment is the process of setting objectives; prioritizing and linking those objectives; and identifying, analysing, and managing risks relevant to achieving those objectives. In addition, risk assessment is defined by Ofori (2011) as procedures organisations go through to identify and analyse the relevant risks which may affect the organisation’s ability to achieve its primary objectives. Ofori (2011) further adds that risk assessment is essential exercise for all companies, irrespective of its size, because every organisation faces a different kind of risk to assess. These risks can manifest from either external or internal sources.

Ndungu (2013), emphasised that “risk assessment component deals with the critical evaluation of factors that affect the possibility of not achieving anticipated consequence. It is the identification and analysis of relevant risks to the success of the objectives, forming a basis for determining how the risks should be managed.”

The OECD (2014) noted that risk assessment is a careful assessment of factors that affect the possibility of objectives of the organisation not being achieved. The OECD also suggested that risk assessment requires identifying clear objectives of the organisation, while the COSO (2013) stated that the prerequisite to risk assessment is the establishment of objectives, linked at different levels and internally consistent.

In summary, risk assessment is an important element to the IC process as it’s an exercise concerned with identifying potential threats to the achievement of an organisation’s goals and objectives.

### 2.3.3. Control activities

Mawanda (2008) describes control activities as basic policies, general rules and procedures an organisation initiates to ensure that all management directives are duly met. These activities aid management to ensure that all the necessary actions are taken to mitigate risks so that the organisation reaches its objectives. Control activities occur throughout the organisation, at all levels and in all functions. Similarly, Beasley (2010) has categorised control activities as adequate separation of duties, proper authorization of transactions and activities, adequate documents and records, physical control over assets and records and independent checks on performances.

Besides, COSO (2013), defined control activities as policies and processes that help ensure management directives are done. Moreover, Naciri (2009) states that control activities are those actions that are taken to address risks that threaten the organisation's ability to achieve its objectives, one of which is reliable financial reporting. Control activities are usually supported by (1) a policy that established what should be done, and (2) the procedure that implements the policy. Lousteau (2006), Naciri (2009) and Dinapoli (2005) further explains that control activities vary in types. Table 2.1 below provides clarity.

**Table 2.1: Control types**

Type	Description
Preventive Control	Lacotelli (2009), states that preventive controls are measures put in place by management to deter and prevent noncompliance with directives, policies and procedures. Lacotelli (2009), further adds that these preventive controls are intended to prevent the risk of irregularities, error and frauds from occurring in transactions which prevents losses. These preventive controls are in the form of: <ul style="list-style-type: none"><li>• Segregation of duties,</li><li>• Proper authorization and approval,</li><li>• The establishment of the organisational chart to allocate jobs to responsible officers,</li><li>• Adequate documentation,</li><li>• Physical control over assets and</li></ul>

Type	Description
	<ul style="list-style-type: none"> <li>• Constant training of participants.</li> </ul>
Detective Controls	<p>Wells (2006), posits that these are controls which are aimed at detecting and uncovering problems such as fraud, irregularities and errors after they have been committed. Wells (2006), further adds that although, detection is necessary prevention is more desirable. These controls are in the form of post-audits, exception reports and validation. They provide evidence that a loss has occurred but do not prevent a loss from occurring. Examples of detective controls are:</p> <ul style="list-style-type: none"> <li>• Reviews,</li> <li>• Analyses,</li> <li>• Variance analyses,</li> <li>• Reconciliation,</li> <li>• Physical inventories and</li> <li>• Audits.</li> </ul> <p>However, detective controls play a critical role in providing evidence that the preventive controls are functioning and preventing losses.</p>
Corrective Controls	<p>The corrective controls are put in place to address anything foreign, and every problem that has occurred in the system (Simmons, 1995).</p>
Directive Controls	<p>According to Rittenberg <i>et al.</i> (2007), directive controls refers to policies and procedures put in place by top management to promote compliance with independence rules. Rittenberg <i>et al.</i> (2007), further added that the policies and procedures from management that are important must pervade the organisation and must be clear and consistent to ensure compliance.</p>

Type	Description
Compensating Controls	As mentioned by Rittenberg <i>et al.</i> (2007), compensating controls are put in place for lack of controls elsewhere in the system. Rittenberg <i>et al.</i> (2007), makes an example that firms with an electronic database could maintain a hard copy of the client list in the office library. Such a list would compensate for downtime in electronic systems and difficulties in locating client names in an automated system.

Source: Compiled from Lousteau (2006), Naciri (2009) and Dinapoli (2005)

In summary, the control activities are considered to be the key controls implemented by management and employees to address risk identified and considered to be a threat to the overall achievement of the organisation's goals and objectives.

#### 2.3.4. Information and communication

According to COSO (2013), "information and communication is the aspect of the IC fundamentals which involves that all apposite information must be identified, captured and communicated in a form and timeframe that enable people to carry out their responsibilities. Information systems turn out reports, containing operational, financial and compliance-related information, that make it possible to run and control the business." Moreover, Asiligwa (2017) adds that information systems produce reports that contain operational, financial and non-financial and compliance-related information and that make it possible to run and control the operation. Also, Theofanis *et al.* (2011), states that "information and communication are one of the most influenced aspects of IC because of its standing and ability to underpin good working relationships at all levels in the organisation."

According to Turnbull and Edwards (2013), effective communication must also happen in a broader sense. This means that it must flow down, across, and up in the organisational structure. All personnel be able to communicate important information upwards in the organisation. This means that there has to be broad communication channels and that the

communication medium should allow for information to easily flow from top to bottom and also across all sections in the organisation (Badara & Siti, 2013).

In summary, information and communication are another critical element of an ICS as this aspect deals with identifying relevant information and communicating such to all relevant structures within the organisation timeously and clearly to the relevant parties to achieve the organisational goals and objectives.

### **2.3.5. Monitoring activities**

Monitoring involves all the activities and procedures that were designed to measure the efficiency and effectiveness of the ICS to achieve the organisation's financial reporting objectives (Jones, 2008). In addition, COSO (2013) states that monitoring is the process entrusted to continuously measure the quality of the organisation's system's performance. According to COSO (2013), the "monitoring controls are controls designed with the primary aim of ensuring that the ICS put in place continue to work as intended. This is achieved through continuous monitoring activities, separate evaluations or a combination of the two." Continuous monitoring occurs during the course of operations. Coffin (2003) also asserted that the activities in monitoring may be ongoing or may be separate assessment, and it is significant in the complex and dynamic environments faced by many organisations.

The literature above on monitoring activities indicates that this element plays a pivotal role regarding the effectiveness of the ICS. It is concerned with monitoring the ongoing changes within the organisation to ensure that implemented control activities continue to operate as intended and more importantly, organisations goals and objectives continue to be achieved.

Based on the literature presented above, we have learned the key points about ICS:

- ICS is a process affected by management and employees aimed at ensuring the achievement of organisations goals and objectives;
- Control environment essentially stems from the tone, culture and discipline set in the organisation which the entire organisation feeds from;

- Risk assessment is a crucial element to the IC process as it's an exercise concerned with identifying potential threats to the achievement of the organisation's goals and objectives;
- Control activities are considered key controls implemented by management and employees to address risk identified and considered to be a threat to the overall achievement of the organisation's goals and objectives; and
- Information and communication is another critical element of ICS as this aspect deals with identifying relevant information and communicating such to all relevant structures within the organisation timeously and clearly.

It can, therefore, be concluded that the implementation of an effective ICS is the responsibility of management and employees. The next section seeks to elaborate on management and employees' responsibilities concerning ICS and overview and the role of post trade services.

#### **2.4. MANAGEMENT AND EMPLOYEES RESPONSIBILITIES IN RELATION TO INTERNAL CONTROL SYSTEMS**

Chatfield and Vangermeersch (2014) suggest that management should identify, analyse, and respond to significant changes that could impact the ICS. This means that IC is a process, and part of that process is the responsibility for management to be continually aware of changes, both internal and external. Those changes should be analysed for both their immediate effect and for any future impact. Therefore, management must then determine any modifications needed in the IC process to adapt to abovementioned changes.

Ayagre *et al.* (2014), also noted that the ICS is an integrated process with the management action to achieve overall organisational goals. That is if achieving organisational objectives can be realised whenever components of the ICS and business process interact ceaselessly (Ayagre *et al.*, 2014). In addition, Dinapoli (2010) noted that the interaction of the elements of the ICS in the business organisation plays a significant role in its effectiveness. Dinapoli (2010) further adds that management is accountable to the Board of Governors, which provides guidance, governance and oversight. Effective board members are capable, objective and inquisitive. They also know of the company's and environment and commit the time needed to fulfil their board responsibilities. Dinapoli (2010) also suggests that

management may be in a position to override controls and ignore or stifle communications from subordinates, enabling dishonest management which intentionally misrepresents results to cover its tracks. A robust and active board, when coupled with effective communication channels and capable financial, legal and internal audit functions, is often best able to identify and correct such a problem.

Essentially, according to Dinapoli (2010), everyone in an organisation has responsibility for IC to some extent. He further asserts that most employees produce information used in the ICS or take other actions needed to effect control. Similarly, all personnel are responsible for communicating the problems in operations, noncompliance with the code of conduct and policy violations or illegal actions. Therefore, each individual in the governance structure has a specific role to play (Dinapoli, 2010). In the chapter below, the discussion turns to post trade services literature and the relationship with internal controls.

## **2.5. OVERVIEW AND ROLE OF POST TRADE SERVICES**

Besta (2017) positioned that when an investor made the decision to buy stocks of Firm A, for example, the investor typically makes use of an intermediary service supplier who executes the order. Subsequently, the stock is transferred to the investor's trading account for their perusal. Besta (2017) further adds that what has happened in between those days is, for the average investor, surrounded by mystery. However, obviously someone must have established ownership, and who owes what to whom, must have set up a transaction in terms of payment and delivery, must have placed the money and the stock in the correct account (Besta, 2017). What happens between those days is a function of post trade services and few specialists have a thorough grasp of what happens behind the scenes. Although it should be noted that post trade services play a critical role in maintaining an efficient financial system (Besta, 2017).

Basically, according to Besta (2017) post trade means the chain of operations performed between the conclusion of a trade and its settlement, i.e. the moment in which money and instruments are transferred. Meanwhile, according to Mai (2005) "post trade services are required after two parties have decided to transfer ownership of a security." Mai (2005) further asserts that there is a need for post trade services following any trade transaction, irrespective if the parties exchanged or over-the-counter ("OTC"), or if the trade involved

consists of domestic or international securities. Only in the case where a trade requires the transfer of a security, would there be a need for post trade services. Mai (2005) notes that the most common securities are equities (shares) and fixed-income securities (such as bonds).

According to Ferrarini and Saguato (2014) “post trading infrastructures provide clearing, settlement, and reporting services to the trading markets, and perform a systemic function by operating as risk management and oversight mechanisms.” Ferrarini and Saguato (2014) also add that:

*“post trading infrastructures are not only counterparties to financial institutions and investors but also respond to the public interest as guardians of financial markets. They contribute to financial stability by providing network services and facilitating connections among market participants”.*

AFME (2015) also supported the abovementioned statements that post trade functions are those performed after the execution of a trade by the trading counterparties or the announcement of a corporate action event by an issuer and play a significant role in the financial sector. AFME (2015) further asserts that post trade services are an indispensable part of the end-to-end transaction and value chain and therefore, enabling as they do the discharge of obligations entered into at trading level, and the processing of corporate actions initiated by the issuers for the benefit of investors.

In summary, post trade services are a chain of operations performed between the completion of a trade and its corresponding settlement, and these services are vital in maintaining an efficient financial system to the interest of investors. The next section outlines the activities performed within the post trade environment based on the background above on post trade services and their importance in the financial system.

## **2.6. POST TRADE SERVICES ACTIVITIES**

Table 2.2 below prepared by Besta (2017) presents the activities that constitute post trade services which will be discussed in this section as well as insights relating to these services.

**Table 2.2: Post trade services**

<b>Trading Matching</b>	<b>Clearing</b>	<b>Settlement</b>	<b>Custody</b>	<b>Safekeeping</b>	<b>Notary</b>
Acquisition of trade data and reconciliation of the terms of the transaction.	The CCP becomes the counterparty to every market participant. Calculation of bilateral balances of every market participant.	Calculation of multilateral balances and generation of the instructions for transferring cash and securities.	Record keeping of accounts owned by issuers and intermediaries. Administration of securities on their behalf.	Physical storage of certificates.	Registration of changes in ownership. Verification of technical and formal requirements.

**Source:** Adapted from Besta (2017)

### **2.6.1. Trade matching**

Besta (2017) notes that the initial step in the post trading activity is “trade matching”. This technical process consists of ensuring consistency of the conditions of the trade as intended by both the buyer and the seller. Usually this is carried out by the trading system itself, in case we are dealing with a regulated exchange that offers a central counterparty (CCP); once the terms of the trade are agreed upon, the system sends the order to the Securities Settlement System (SSS).

### **2.6.2. Clearing**

The second phase is called “Clearing”, and is performed by the central counterparty (CCP) (Besta, 2017). Clearing is the connection between trading and settlement, as it validates the trades and prepares information for the next step (Besta, 2017). The clearing occurs post-

execution and refers to the set of steps involved in preparing executed trades for settlement and the submission of settlement instructions.

### **2.6.3. Settlement**

Settlement consists of the effective transfer of ownership from a seller to a buyer, and the correspondent transfer of cash from a buyer to a seller (Besta, 2017). Settlement of a cash trade refers to the stage in which ownership of securities passes from the seller to the buyer in exchange for cash.

### **2.6.4. Custody**

According to Besta (2017), custody relates to all those services, including account keeping and administration of securities on behalf of customers. This is usually performed by a CSD (the organisation that manages as well the settlement stage).

### **2.6.5. Safeguarding**

Besta (2017) notes that physical issuance of certificates has become less frequent. Traditionally, banks, apart from CSD, were entrusted with this issuance, as they were considered a logical and safe location by the owners of the certificates. Despite that, dematerialisation is trending upwards, and this will contribute to the extinction of such a service.

### **2.6.6. Notary**

Besta (2017) suggest that the notary function is set up to certify whether securities issued fulfil legal and technical requirements. Besta (2017) further adds that notary represents the entry point in the case of both Initial Public Offerings and Seasoned Public Offerings. The CSD has the important role of providing, together with the intermediary, the definitive record of the legal title as far as the instruments recorded in that CSD are concerned. This nuance of the notary function resembles the function of keeping a register

Having presented the post trade services and activities involved above. The next section describes the market players that are involved in post trade services.

## **2.7. PROVIDERS OF POST TRADE SERVICES**

According to (Besta, 2017), the following providers of post trade services:

- **Custodians:**  
Custodians offer mainly safekeeping and custody services (Besta, 2017).
- **International Central Securities Depositories (ICSDs):**  
According to (Besta, 2017) ICSDs offer every “core” service a part from safekeeping and they operate on an international basis.
- **Central Securities Depositories (CSDs):**  
Besta (2017) mentioned that CSDs generally cover one single jurisdiction (operating on a national level). Still, they can implement measures to provide services in more than one by, for instance, becoming part/member of other CSDs.
- **Common Depositories:**  
Common depository’s main objective is to provide safekeeping and notary services (Besta, 2017).
- **Registrars:**  
Registrars are mainly firms that offer assets services; rarely, banks as well (Besta, 2017).

Table 2.3 summarises market players involved in the post trade services and what they do:

**Table 2.3: Post trade services market players**

<b>Market Players</b>	<b>Clearing</b>	<b>Settlement</b>	<b>Custody</b>	<b>Safekeeping</b>	<b>Notary</b>
<i>Custodians</i>	x	x	x	x	
<i>ICSD</i>	x	x	x		x
<i>CSD</i>	x	x	x	x	x
<i>Common Depositories</i>				x	x
<i>Registrars</i>					x

**Source:** Adapted from Besta (2017)

## **2.8. POST TRADE SERVICES AND INTERNAL CONTROLS**

ESMA (2015) noted that organisations must have post trade controls to monitor their trading activity and take appropriate action where controls are triggered. These controls should include:

- Conduct a continuous assessment and monitoring of market and credit risk exposures (these must be capable of being calculated real-time);
- Adopt controls over maximum longs and shorts (and overall strategy positions) for derivatives, specific to the instrument;
- Maintain complete, accurate and consistent trade and account information;
- Maintain electronic trading logs, reconciled with relevant third parties such as trading venues, brokers; and
- Ensure traders and the risk function undertakes post trade monitoring.

In summary, post trade services are vital in maintaining an efficient and stable financial market system to the interest of investors. The researcher also postulates that, to maintain an efficient and stable financial market system, internal controls within the post trade chain are vital to ensure that risks are managed at an appropriate level. The following section discusses financial market infrastructures and their role with respect to financial stability.

## **2.9. OVERVIEW AND THE ROLE OF FINANCIAL MARKETS INFRASTRUCTURES**

Ferrarini and Saguato (2014) noted that “financial markets infrastructure is multilateral systems or networks, which provide trading, clearing, settlement, and reporting services about securities and derivative transactions.” Besides, Ferrarini and Saguato (2014) further asserted that the infrastructure of financial markets supports the financial markets by connecting counterparties, providing essential services, reducing transaction costs through economies of scale, fostering transparency, and managing systemic and counterparty risks.

IOSCO (2011) defined financial markets infrastructure “a multilateral system among participating financial institutions, including the operator of the system, used for recording, clearing, or settling payments, securities, derivatives, or other financial transactions”. In addition, Diehl (2015) suggested that financial market infrastructures are essential for the well-functioning of the financial system, as they play a central role in facilitating clearance and settlement of financial transactions such as payments, securities, and derivatives contracts. Diehl (2015) further added that currently it is accepted that the proper functioning of systemically important financial market infrastructures is also vital to maintain financial stability; their failure for solvency reasons or operational disruptions could almost certainly lead to systemic instability. Consequently, the adequate supervision of financial market infrastructures is inherent to the function of preserving financial stability.

In addition, IOSCO (2011), further suggested that financial market infrastructures typically establish a set of standard rules and procedures for all participants, a technical infrastructure, and a specialised risk management framework appropriate to the risks they incur. Financial Market Infrastructures provide participants with centralised recording, clearing, netting, and settlement of financial transactions among themselves or between each of them and a central party to allow for greater efficiency and reduced costs and risks (IOSCO, 2011). Through the centralisation of specific activities, financial market infrastructures also enable participants to manage their risks more efficiently and effectively, and, in some instances, eliminate specific risks. Financial Market Infrastructures can also promote increased transparency in certain markets.

Moreover, IOSCO (2011) indicates that financial market infrastructures play a critical role in the financial system and the broader economy. Financial Market Infrastructures refers to

payment systems, central securities depository, securities settlement systems, central counterparty, and trade repositories. These infrastructures need to facilitate the clearing and settlement of monetary and other financial transactions, which include payments, securities, and derivative contracts. While safe and efficient, financial market infrastructures contribute to maintaining and promoting financial stability and economic growth, financial market infrastructures also concentrate risk. If not properly managed, financial market infrastructures can also be sources of a financial shock, such as liquidity dislocations and credit losses, or a major channel through which these shocks are transmitted across international and domestic financial markets.

IOSCO, 2011 clearly stated the following:

*“Financial market infrastructures that facilitate the recording, clearing, and settlement of monetary and other financial transactions can strengthen the markets they serve and play a critical role in fostering financial stability; however, if not properly managed, they can pose significant risks to the financial system and be a potential source of contagion, particularly in periods of market stress”* (IOSCO, 2011).

Furthermore, Goodspeed (2018) mentions that “central to the clearing and settlement of monetary and financial transactions in global and domestic financial systems.” Financial Market Infrastructures include important and systemic payment systems, securities settlement systems, central securities depositories, central counterparties and trade repositories.

Therefore, it can be summarised that financial market infrastructures are essential for the well-functioning of the financial system, as they play a central role in facilitating clearance and settlement of financial transactions (i.e. post trade services). Essentially financial markets infrastructures facilitate recording, clearing, netting and settlement of monetary transactions involved in the financial system (i.e. post trade services). Moreover, financial markets infrastructures are critical to maintaining and preserving financial stability.

Financial markets infrastructures also play a pivotal role in the broader economy in ensuring that costs and risks are minimised. Important to also note that financial market infrastructures manage these risks through the establishment of principles, rules, procedures and ensuring that there is an appropriate risk management framework in place. The guiding principles will

be discussed in section 2.11. We learned from the literature provided above that there are different types of financial markets infrastructures which are explained in the section below.

## **2.10. TYPES OF FINANCIAL MARKETS INFRASTRUCTURES**

### **A) Payment system**

IOSCO (2011) mentioned that a payment system is a set of instruments, which also includes procedures and rules for the transfer of funds between or among participants; the system includes the participants and the organisation operating the arrangement. In addition, payment systems are usually based on an agreement between or among participants and the operator, and the transfer of funds is achieved using an agreed upon operational infrastructure.

Goodspeed (2018) also noted that payment systems could be firstly, large-value payment systems capable of handling high-priority and sizeable payments such as interbank foreign exchange transactions. Secondly, retail payment systems, which handle relatively low-value, large-volume payments such as credit and debit card transactions, debit orders, electronic fund transfers and cheques. Generally retail payment systems, while important and prominent, are in the short-term not regarded as systemically important systems.

Goodspeed (2018) also added to the above and mentioned that the “payment system is an arrangement of instruments, procedures and rules for the transfer of funds between participants such as commercial banks. The organisation operating the system and the participants are generally considered to be part of the system.” Thus, a payment system is usually considered systemically important if a disruption in its operation could firstly, threaten the stability of or confidence in a financial system. Or secondly, this also leads to serious consequences for business continuity in the economy.

### **B) Central securities depository (CSD)**

Li and Marinč (2016:139) mentioned that CSDs are involved in settlement of securities traded on their respective local markets and are often part of the exchange in their country. Li and Marinč (2016:139) further added that CSDs make possible processing and settlement

of securities transactions by book entry. They provide custodial services (e.g. the administration of corporate actions and redemptions) and play an active role in ensuring the integrity of securities' issues. Goodspeed (2018) also added that CSD immobilises or dematerialises physical securities and transfers ownership through book entries to electronic accounting systems. To eliminate principal risk best international practice requires a CSD to put in place a delivery-versus-payment mechanism, which links the funds transfer (payment) system and the securities transfer (delivery) system to ensure delivery occurs if and only if payment occurs.

Ferrarini and Saguato (2014) also mentioned that a CSD traditionally operates in the settlement phase of cash transactions, by holding the securities of listed entities (either in certificate form or dematerialised) and managing the transfer of the same from the seller to the buyer; a new and growing function of CSDs relates to the management and transfer of collateral. A CSD plays a vital role in containing the operational risk of securities markets.

While IOSCO (2011) states that:

*“a CSD holds securities accounts and, in many countries, operates a securities settlement system. A CSD also provides central safekeeping and asset services, which may include the administration of corporate actions and redemptions. This plays an important role in helping to ensure the integrity of securities issues, that is, securities are not accidentally or fraudulently created or destroyed, or their details changed. A CSD can hold securities either in physical form (but immobilised) or in a dematerialised form, that is, they exist only as electronic records). The precise activities of a CSD vary based on jurisdiction and market practices.”*

### **C) Securities settlement systems (SSSs)**

IOSCO (2011) mentioned that:

*“... a securities settlement system enables securities to be transferred and settled by book entry according to a set of predetermined multilateral rules. Such systems allow transfers of securities either free of payment or against payment. An SSS may be organised to provide additional securities clearing and settlement functions, such as the confirmation of trade and settlement instructions”.*

While Goodspeed (2018) stated that:

*“a SSS enables securities to be transferred and settled by book entry either free of payment or against payment (i.e. delivery-versus-payment). An SSS may provide additional functions, such as the confirmation of trade and settlement instructions and the safekeeping of securities. In practice, CSDs often perform the functions of SSSs.”*

#### **D) Central counterparty (CCP)**

According to Goodspeed (2018), CCP or clearinghouse interposes itself between the buyer and the seller and assumes the rights and obligations of both parties. Thus, CCPs become the buyer to every seller and the seller to every buyer, thereby ensuring the performance of open contracts. In theory, a CCP reduces systemic risk by netting the trades of all counterparties, which reduces counterparty risk and minimises cash flows between counterparties. Ferrarini and Saguato (2014) also support and suggest that a CCP interposes between counterparties becoming the ‘seller to every buyer and the buyer to every seller’. By netting the opposite positions of its members, a CCP mitigates the overall counterparty credit risk, creates more effective mechanisms to assess the potential default risk of its members, and ultimately contributes to the reduction of systemic risk.

While the IOSCO (2011), added that central counterparty interposes itself between counterparties to contracts traded in one or more suggests that financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the performance of open contracts. A CCP becomes the counterparty to trades with market participants through novation, an open-offer system, or through an analogous legally binding arrangement. CCPs have the potential to reduce risks significantly to participants through the multilateral netting of trades and by imposing more effective risk controls on all participants.

#### **E) Trade repositories (TRs)**

Ferrarini and Saguato (2014) noted that TRs make the relevant market more transparent, providing regulators with information on relevant transactions, and market participants with aggregated data on concluded deals. In comparison, Goodspeed (2018) mentioned that trade repositories maintain a centralised database of open OTC derivatives transactions and

allow access to this information by the public and central banks, securities and market regulators, and prudential supervisors of market participants. The primary benefit of TRs has improved market transparency in OTC derivatives markets.

IOSCO (2011) suggested that a TR is an organisation that maintains a centralised electronic record (database) of transaction data. TRs have emerged as a new type of FMI and have recently grown in importance, particularly in the OTC derivatives market. By centralising the collection, storage, and dissemination of data, a well-designed TR that operates with adequate risk controls can serve an essential role in enhancing the transparency of information to relevant authorities and the public, promoting financial stability, and supporting the detection and prevention of market abuse. An important function is to provide information that supports risk reduction, operational efficiency, and cost savings for both individual entities and the market as a whole. Such entities may include the principals to a trade, their agents, CCPs, and other service providers offering complementary services, including central settlement of payment obligations, electronic novation and affirmation, portfolio compression and reconciliation, and collateral management.

As noted above that financial market infrastructures manages these risks through the establishment of principles, rules, procedures and ensuring that there is an appropriate risk management framework in place. The following section discusses the principles of financial market infrastructures.

## **2.11. PRINCIPLES FOR FINANCIAL MARKETS INFRASTRUCTURES**

According to IOSCO (2011), the following are the general principles of financial markets infrastructures:

- **“1<sup>st</sup> Principle: legal basis**

An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each aspect of its activities in all relevant jurisdictions.

- **2nd Principle: governance**

An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.

- **3<sup>rd</sup> Principle: framework for the comprehensive management of risks**

An FMI should have a sound risk management framework for comprehensively managing legal, credit, liquidity, operational, and other risks. Credit and liquidity risk management.

- **4<sup>th</sup> Principle: credit risk**

An FMI should effectively measure, monitor, and manage its credit risk from participants and from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. A CCP should also maintain additional financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the [one/ two] participant[s] and [its/their] affiliates that would potentially cause the largest aggregate credit exposure[s] in extreme but plausible market conditions.

- **5<sup>th</sup> Principle: collateral**

An FMI that requires collateral to manage its or its participants' credit risk should accept collateral with low credit, liquidity, and market risk. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.

- **6<sup>th</sup> Principle: margin**

A CCP should cover its credit exposures to its participants for all products through an effective margin system that is risk-based and regularly reviewed.

- **7<sup>th</sup> Principle: liquidity risk**

An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources to effect same-day and, where the appropriate, intraday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default

of [one/two] participant[s] and [its/their] affiliates that would generate the largest aggregate liquidity need in extreme but plausible market conditions.

- **8<sup>th</sup> Principle: settlement finality**

An FMI should provide clear and certain final settlement, at a minimum, by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real-time.

- **9<sup>th</sup> Principle: money settlements**

An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.

- **10<sup>th</sup> Principle: physical deliveries**

An FMI should clearly state its obligations concerning the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries. Central securities depositories and exchange-of-value settlement systems.

- **11<sup>th</sup> Principle: central securities depositories**

A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues and minimise and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry.

- **12<sup>th</sup> Principle: exchange-of-value settlement systems**

If an FMI settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.

- **13<sup>th</sup> Principle: participant default rules and procedures**

An FMI should have effective and clearly defined rules and procedures to manage a participant default that ensures that the FMI can take timely action to contain losses and liquidity pressures, and continue to meet its obligations.

- **14<sup>th</sup> Principle: segregation and portability**

A CCP should have rules and procedures that enable the segregation and portability of positions and collateral belonging to customers of a participant. General business and operational risk management

- **15<sup>th</sup> Principle: general business risk**

An FMI should identify, monitor, and manage its general business risk and hold sufficiently liquid net assets funded by equity to cover potential general business losses so that it can continue providing services as a going concern. This amount should at all times be sufficient to ensure an orderly wind-down or reorganisation of the FMI's critical operations and services over an appropriate time period.

- **16<sup>th</sup> Principle: custody and investment risk**

An FMI should safeguard its assets and minimise the risk of loss or delay in access to those assets, including assets posted by its participants. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.

- **17<sup>th</sup> Principle: operational risk**

An FMI should identify all plausible sources of operational risk, both internal and external, and minimise their impact through the deployment of appropriate systems, controls, and procedures. Systems should ensure a high degree of security and operational reliability and have an adequate, scalable capacity. Business continuity plans should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale disruption.

- **18<sup>th</sup> Principle: access and participation requirements**

An FMI should have an objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.

- 19<sup>th</sup> Principle: tiered participation arrangements**  
 An FMI should, to the extent practicable, identify, understand, and manage the risks to it arising from tiered participation arrangements.
- 20<sup>th</sup> Principle: FMI links**  
 An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.
- 21<sup>st</sup> Principle: efficiency and effectiveness**  
 An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.
- 22<sup>nd</sup> Principle: communication procedures and standards**  
 An FMI should use or accommodate the relevant internationally accepted communication procedures and standards to facilitate efficient recording, payment, clearing, and settlement across systems.
- 23<sup>rd</sup> Principle: disclosure of rules and procedures**  
 An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed
- 24<sup>th</sup> Principle: disclosure of market data**  
 A TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs".

Table 2.4 below indicates the principles which apply to each financial market infrastructures.

**Table 2.4: General applicability of principles to specific types of FMIs**

Principle	Payment systems	CSDs and SSSs*	CCPs	TRs
1. Legal basis	X	x	x	x

Principle	Payment systems	CSDs and SSSs*	CCPs	TRs
2. Governance	X	x	x	x
3. Framework for the comprehensive management of risks	X	x	x	x
4. Credit risk	X	x	x	
5. Collateral	X	x	x	
6. Margin			x	
7. Liquidity risk	X	x	x	
8. Settlement finality	X	x	x	
9. Money settlements	X	x	x	
10. Physical deliveries		x	x	
11. Central securities depositories		x		
12. Exchange-of-value settlement systems	X	x	x	
13. Participants-default procedures	X	x	x	
14. Segregation and portability			x	
15. General business risk	x	x	x	x
16. Custody and investment risk	x	x	x	x
17. Operational risk	x	x	x	x
18. Access and participation requirements	x	x	x	x
19. Tiered participation arrangements	x	x	x	x
20. FMI links	x	x	x	x
21. Efficiency and effectiveness	x	x	x	x
22. Communication procedures and standards	x	x	x	x
23. Disclosure of rules and key procedures	x	x	x	x
24. Disclosure of market data				x
* The applicability of certain principles for CSDs and SSSs will vary with the design of the FMI.				

**Source:** Adapted from IOSCO (2011)

In summary, the financial market infrastructures manage risks faced within their environment through the effective application of the principles outlined above. These principles are essential within the financial market infrastructure to ensure the risks posed in the

environment are appropriately managed. It can be mentioned that these principles are controls put in place by the financial market infrastructure to ensure that goals and objectives are achieved. Effective application of these principles (i.e. internal controls) by financial market infrastructures ensures threats to the achievement of the organisation's goals and objectives are minimised. The researcher also notes that post trade services are embedded in the financial market infrastructures. Therefore, it is essential for providers of post trade services to adhere to the applicable principles of financial market infrastructures to manage risks facing the environment. This is an important aspect because post trade services are vital in maintaining an efficient and stable financial system to the interest of investors.

## **2.12. CHAPTER SUMMARY**

This chapter commenced by presenting literature on the definition of ICS where it was mentioned that ICS are a process affected by management and employees aimed at ensuring achievement of organisations goals and objectives. The ICS process was also discussed where the five elements of internal control were presented. These elements are control environment, risk assessment, control activities, information and communication and monitoring activities.

The different types of control activity types were also discussed in the chapter. These are preventive controls, detective controls, corrective controls, directive controls and compensating controls. This control activity types are considered key controls implemented by management and employees to address risk identified and considered to be a threat to the overall achievement of the organisation's goals and objectives.

The literature then proceeded to outline management responsibilities in relation to ICS. Thus, it was learned that everyone in the organisation has responsibility for IC to some extent. Similarly, all personnel are responsible for communicating the problems in operations, noncompliance with the code of conduct and policy violations or illegal actions. Therefore, each individual in the governance structure has a particular role to play in the IC process as far as achievement of organisation goals and objectives.

The chapter also provided an overview and principles of financial market infrastructures. From the literature discussion, we learned that financial markets infrastructures are

multidimensional system which consists of various financial participants. Essentially financial markets infrastructures facilitate recording, clearing, netting and settlement of monetary transactions involved in the financial system. Moreover, financial markets infrastructures are critical to maintaining and preserving financial stability. In addition, financial markets infrastructures play a pivotal role in the broader economy in ensuring that costs and risks are minimised. Important to also note that financial market infrastructures manage these risks through the establishment of IC processes (i.e. principles, rules, procedures and ensuring that there is an appropriate risk management framework in place).

This literature chapter also presented types of financial markets infrastructures. These are payments system, central securities depository, securities settlement systems, central counterparty and trade repositories. The twenty-four (24) principles for the financial markets' infrastructures were also discussed in the chapter. These principles are essential within the financial market infrastructure to ensure the risks posed in the environment are appropriately managed. It can be mentioned that these principles are controls put in place by the financial market infrastructure to ensure that goals and objectives are achieved. The researcher also notes that post trade services are embedded in the financial market infrastructures. Therefore, it is essential for providers of post trade services to adhere to the applicable principles of financial market infrastructures to manage risks facing the environment. This is an important aspect as post trade services are vital in maintaining an efficient and stable financial system to the interest of investors.

The next chapter explores and discusses the relevant research methodology applied in this study in an attempt to address SO 3.

## CHAPTER 3

### RESEARCH METHODOLOGY

#### 3.1. INTRODUCTION

The purpose of this study is to establish whether internal control systems in selected financial market infrastructures are perceived to affect post trade services. The previous chapter discussed available literature during which a few significant themes emerged. The purpose of chapter three is to address the third secondary objective, as noted in chapter one (paragraph 1.9.2), which is:

*SO3: Identify the research methodology to be applied in this study.*

Attention is paid to the philosophical underpinnings of the research methodology in this chapter. The researcher begins by defining the theoretical paradigms, then the research design and method. The researcher proceeds to define the population and sampling employed, including highlighting the reasons for selecting a specific approach and sample method. Lastly, the ethical considerations applied in performing this study to address the research objectives are discussed.

#### 3.2. THEORETICAL PARADIGMS

Kuhn (cited in Flick, 2009) defined a paradigm as an integrated cluster of substantive concepts, variables and problems attached with corresponding methodological approaches and tools. On the other hand, Guba and Lincoln (1994) refer to a paradigm a basic system or worldview that guides the investigator. Similarly, Chalmers (1982) suggest that a paradigm is “made up of the general theoretical assumptions and laws, and techniques for their application that the members of a particular scientific community adopt.” It is generally acknowledged that a paradigm has the following five components (Chalmers, 1982):

- Explicitly stated laws and theoretical assumptions;
- Standard ways of applying the fundamental laws to a variety of situations;

- Instrumentation and instrumental techniques that bring the laws of the paradigm to bear on the real world;
- General metaphysical principles that guide work within the paradigm; and
- General methodological prescriptions about how to conduct work within the paradigm.

Covey (1989) noted that, it is a general believe that personal paradigms have a powerful effect because it creates a lens through which the world is observed. Moreover, Hussain *et al.* (2013:2374) believe that human sciences use the term paradigm in three ways, namely to: (i) institutionalise intellectual activities, (ii) broadly groupings specific approaches and/or perspectives to the study any subject, and (iii) describe broad approaches to research such as positivist or interpretive paradigms (Tuli, 2010:97).

The following section elaborates further on the difference between positivist and interpretive paradigm.

### **3.2.1. Positivist paradigm**

Henning *et al.* (2004:7) noted that the positivist paradigm of exploring social reality is based on the philosophical ideas of the French Philosopher Auguste Comte. In addition, Van Rensburg and Smit (2004) observation and reason are the best means of understanding human behaviour; true knowledge is based on the experience of senses and can be obtained by observation and experiment. Moreover, Creswell (2009:7), posits that positivism is regarded as "scientific method" or "science research" and is "based on the rationalistic, empiricist philosophy that originated with Aristotle, Francis Bacon, John Locke, Auguste Comte, and Emmanuel Kant" (Mertens, 2005:8). Walsham (1995) explains that the positivist position maintains that scientific knowledge consists of facts while its ontology considers the reality as independent of social construction.

The ontological component of positivism is one of realism or common sense (Hudson & Ozanne, 1988). In comparison, Wand and Weber (1993:220) refer to the term ontology to a branch of philosophy concerned with articulating the nature and structure of the world. They further add that ontology specifies the form and nature of reality and what can be learned about it. Tuli (2010:98) stated that the only phenomena that positivists believe can produce

knowledge are those which they can understand using their senses (sight, smell, touch, hearing and taste). Here McKerchar (2008) concurred by stating that the positivist attitude is founded in the ontology of realistic foundationalism. This means that the world exists independently from our knowledge; that is to be objective and separated from the researcher.

Epistemology, on the other hand, refers to “the nature of the relationship between the researcher (the knower) and it denotes” (Hirschheim *et al.*, 1995). In comparison, Walliman (2011) described epistemology as the theory of knowledge, specifically in connection with its validation and methods used. He further claimed that this component of research is concerned with how we know things and what we regard as acceptable in a discipline. The approach used in positivism to acquire this knowledge is one of empiricism, which constitutes that observation and measurement are at the core of the scientific endeavour (Walliman, 2011).

### **3.2.2. Interpretive paradigm**

Interpretive research is concerned with subjective meanings as it seeks to recognise the individuals’ interpretation and understanding of the social phenomena (Schwandt, 1994). Denzin and Lincoln (1998) also suggest that in interpretivism research, terms such as dependability, credibility, confirmability and transferability replace the usual positivist criteria of internal and external validity, reliability and objectivity. Moreover, interpretivists believe that adopting a cause-and-effect relationship in social sciences is not applicable. Thus, the interpretivist researcher aims to rather explore an individuals’ perceptions, and then share the meaning thereof; thus developing insights concerning the observed case (Bryman & Bell, 2011; Tuli, 2010:95). This research did not apply interpretive paradigm as it uses subjective means to reach a conclusion.

Interpretivist researchers aim to see the world through the eyes of the participants, allowing them numerous viewpoints of reality (and not only one reality) that a positivist researcher aims to achieve (Tuli, 2010:94). Thus, the interpretivist researcher cannot be detached from the subject being studied. From an ontological perspective, interpretivists are not concerned with the objective reality that is “out there” but instead, with knowing and investigating specific subjective realities that exist “in here” (Manroop *et al.* 2014:795). Tuli (2010) later

concluded that the ontological position of interpretivists is, in general, subjective. It is based on the internal realism that investigates reality either as a personal construction or an intersubjective construction. Thus, making sense of the world through continuously interpreting, creating, defining, justifying and rationalizing the daily actions of phenomena in the social sciences. Besides, the epistemological position of interpretivism is one of subjectivism, which is grounded in actual world phenomena. Although the world does not exist freely of our knowledge of it, it can be interpreted on an individual basis, but can never really be known (Repko 2012). The interpretivist paradigm is one of realism and does not provide a hard and vast explanation from which spontaneous connections or predictions can be made (Walliman 2011).

Table 3.1 displays the characteristics of interpretivism, categorised into the purpose of the research, the nature of reality (ontology), methodology.

**Table 3.1: Characteristics of Interpretivist**

Feature	Description
Purpose of research	Understand and interpret students' and teachers' perspectives on the factors that could impact the successful use of e-learning and face-to-face instructional approaches in a manner that they complement each other.
Ontology	<ul style="list-style-type: none"> <li>• There are multiple realities.</li> <li>• Reality can be explored and constructed through human interactions and meaningful actions.</li> <li>• Discover how people make sense of their social worlds in the natural setting by means of daily routines, conversations and writings while interacting with others around them. These writings could be text and visual pictures.</li> <li>• Many social realities exist due to varying human experience, including people's knowledge, views, interpretations and experiences.</li> </ul>

Feature	Description
Epistemology	<ul style="list-style-type: none"> <li>• Events are understood through the mental processes of interpretation that is influenced by interaction with social contexts.</li> <li>• Those active in the research process socially construct knowledge by experiencing real-life or natural settings.</li> <li>• Inquirer and the inquired-into are interlocked in an interactive process of talking and listening, reading and writing.</li> <li>• A more personal and interactive mode of data collection.</li> </ul>
Methodology	<ul style="list-style-type: none"> <li>• Processes of data collected by text messages, interviews, and reflective sessions;</li> <li>• Research is a product of the values of the researcher.</li> </ul>

**Source:** Mlenzana (2013).

Therefore, this study used the positivist paradigm as it was aimed at uncovering objective results through the use of a questionnaire. In addition, the positivistic paradigm is adopted in this study, as it prefers precise quantitative data, often using surveys and statistics through the use of a questionnaire (Neuman, 2014). The next section discusses the research design and method that was adopted in this study.

### **3.3. RESEARCH DESIGN AND METHOD**

#### **3.3.1. Research design**

Marczyk *et al.* (2005) mentioned that research design refers to the many ways in which research can be conducted to answer the question being asked. Kothari (2004) noted that:

*“a research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. This study employed scientific methods to collect and analyse data.”*

The following section provides clarity on the data collection method, research instrument, population and sample size and data analysis.

### **3.3.2. Data collection method**

According to Hair *et al.* (2001) and Baines *et al.* (2009:494), raw data can be collected through experiments, observation and surveys. Surveys usually link to descriptive research and quantitative research. Furthermore, Babbie and Mouton (2001) also explain that surveys, when analysed, can aid in the speedy creation of statistical graphics. This study used the Survey Monkey tool as a data collection method as this allowed for quantitative data that can be easily analysed and assist in easy-to-create graphical presentations.

On the other hand, questionnaires do not allow interaction with or observe sampling units, which was the case for this study (Hofstee, 2006). Nonetheless, Hofstee (2006) mentioned that questionnaires offer confidentiality, and the participants need not provide any confidential or personal information. Furthermore, the questionnaires aided to analyse the data to obtain quantitative results easily. Primary data were exported into an electronic spreadsheet to analyse the data, and no coding was necessary since the web-based design questionnaire automatically predetermined numbering for each question. In measuring the perception of the respondents, the researcher used the Likert scale type questions. The researcher used Minitab software to analyse and summaries the results quantitatively. Minitab software helps to spot trends, solve problems and discover valuable insights in data to deliver comprehensive and best-in-class suite of machine learning, statistical analysis and process improvement tools. The data analysis and interpretation of the results were performed with the assistance of a qualified statistician.

### **3.3.3. Research instrument**

In this study, a self-administered web-based questionnaire (see Appendix A) was prepared whereby participants of the study were requested to follow a universal resource locator (URL) to access the questionnaire and to answer the questions. The questionnaire was divided into three parts: in the first section, demographic information of the participants was requested. The second part of the questionnaire was divided into the five components of the COSO framework. The third part was based on the principles of financial markets infrastructures. All questions were relevant to the internal control systems in post trade services, and participants were required to indicate whether the selected financial market infrastructure has implemented certain control elements and principles.

In this study, the information was collected through self-administered questionnaires using the automated research tool Survey Monkey. Therefore, each question will be automatically coded and exported to an electronic spreadsheet for analyses. Each question had five options of selection, and the participants were provided with an option to select their answer of preference based on their perception.

The following section discusses population and sampling used in this study.

### **3.4. POPULATION AND SAMPLING**

#### **3.4.1. Population**

Hair *et al.* (2011:165) and Welman *et al.* (2005:52,162), mentioned that a population is the study of objects that may comprise groups, individuals, human products, events, organisations and the conditions they are exposed to or elements applicable to a research project. Here Polit and Hungler (1999:37) refer to the population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. Similarly, Asika (1991:39) suggest that a population is made up of all conceivable elements, themes or observations relating to a particular phenomenon of interest to the researcher.

Therefore, based on the studies presented above, it can be summarised that a population comprising of all groups, objects, subjects or observations relating to a specific area of interest of a research project. The population of this study is all the South African Financial Market Infrastructures.

#### **3.4.2. Sampling**

According to Bryman and Bell (2011), a sampling process is used to reduce a population to recognise an appropriate sample where the related information required is accessible and for it to be targeted to fulfil the research objective. Similarly, the process of selecting a portion of the population to represent the entire population is known as sampling (Polit & Hungler, 1999:95). Moreover, a sample is a subset of a population selected to participate in the study. It is a fraction of the population which is selected to participate in the research project (Hair

*et al.*, 2011:236; Polit & Hungler, 1999:227). Therefore, a sampling process involves selecting a representative sample from a population to express an opinion that reflects the views of the population.

According to Showkat and Parveen (2017), there are two different types of sampling methods; they are categorised as probability sampling and non-probability sampling methods. The following section discusses different sampling methods found in sampling.

### 3.4.2.1. Probability sampling

Showkat and Parveen (2017) mentioned that in probability sampling, each sample has an equal probability of being chosen. A probability sample is one in which each element of the population has a known non-zero probability of selection. This method of sampling gives the probability that our sample is representative of a population. Some probability sampling methods are as follows in table 3.2:

**Table 3.2: Probability sampling methods**

Method	Description
Simple Random Sampling	Simple random sampling is a completely random method of selecting a sample in which each element and each combination of elements in the population have an equal probability of being selected as a part of the sample. This is one of the simplest forms of random sampling. This method is a fair way to select a sample. As each member of the population has an equal probability of being selected, simple random sampling is the best-known probability sample.
Stratified Random Sampling	Stratified Random Sampling is an improvement over systematic sampling. In this method, the population elements are divided into strata on the basis of some characteristics and from each of these smaller homogeneous groups draws at random a predetermined number of units.

Method	Description
Systematic Random Sampling	Systematic sampling is an improvement over simple random sampling. This method requires complete information about the population. In this sampling method, we select one unit from the sampling frame and then calculations to draw the following units are done based on the interval size.
Cluster Sampling	Cluster sampling is one of the efficient methods of random sampling in which the population is first divided into clusters, and then a sample is randomly selected from the clusters. Unlike the above, in pure cluster sampling, the whole cluster is sampled.
Multi-stage Systematic Sampling	This method uses a combination of various techniques to draw the sample. In this method, the population is divided into groups at various levels - a group within a group, within a group and so on. The sample is finally drawn from the smallest group among all the groups.

**Source:** Showkat and Parveen (2017)

### 3.4.2.2. Non-probability sampling

According to LoBiondo-Wood and Haber (1998:249), the non-probability sampling method is less vigorous and tends to produce less accurate and less representative samples than probability or random samples. Essentially non-probability sampling implies that not every element of the population has an opportunity for being included in the sample, such as convenience (accidental), quota, purposive and network sampling procedures (Burns & Grove, 2003:804). Some non-probability methods of sampling are described as follows under table 3.3 below:

**Table 3.3: Non-probability sampling methods**

Method	Description
Convenience Sampling	In this type of sampling, researchers prefer participants as per their own convenience. The researcher selects the closest live persons as respondents. Inconvenience sampling, subjects who are readily accessible or available to the researcher are selected.
Purposive Sampling	In this type of sampling, the researcher chooses the participants as per his/her own judgment, keeping back in mind the purpose of the study. It uses the judgment of an expert in selecting cases, or it selects cases with a specific purpose in mind. This type of sampling is used in exploratory research or in field research.
Quota Sampling	In this sampling method, we pre-plan the number of participants in specified categories. The sample is select according to a fixed quota. This sampling method can further be divided into an uncontrolled quota or a controlled quota sample. In uncontrolled quota sampling, the researcher selects the sample conveniently. In controlled quota sampling, some restrictions are imposed to limit the choice of the researcher.
Snowball sampling	Also called "chain referral sampling," in this method, the sample is actually collected in various stages. Snowball sampling, which is a non-probability sampling method is basically sociometric in nature. Although snowball sampling is considered to be a form of accidental sampling by some, this method is appropriate when the members of a special population are difficult to locate, for example, homeless people, migrant workers etc.

**Source:** Burns and Grove (2003:804); LoBiondo-Wood and Haber (1998:249)

Non-probability sampling method was used to collect the data in this study. The researcher did not envisage that every element in the population had an opportunity of being selected

from the population. The sample was drawn from selected financial markets infrastructures wherein the researcher was provided written approval and consent by the one selected financial market infrastructure perform the study. For the purposes of this study, this one financial market infrastructure is referred to in this study as *Institution X*.

Institution X's main function is to raise primary capital by rechanneling cash resources into productive economic activity, thus building the economy while enhancing job opportunities and wealth creation. The participants are individually employed in post trade services unit at Institution X. All the participants employed are considered to have experience and exposure to post trade services internal control systems.

The following section focuses on different types of research.

### **3.5. TYPES OF RESEARCH**

#### **3.5.1. Qualitative research**

According to Ben-Eliyahu (cited by Rhodes 2014), a qualitative research approach involves gathering information focuses on describing a phenomenon in a deep, comprehensive manner. Ben-Eliyahu further adds that this is generally done in interviews, open-ended questions, or focus groups. In most cases, a small number of participants participate in this type of research, because to carry out such a research endeavour requires many resources and much time. Interviews can vary from being highly structured and guided by open-ended questions, or be less structured and take the form of a conversational interview. In addition, Yilmaz (2013:315) also suggested that qualitative studies usually have what, how and why questions that require the collection of qualitative data rather than quantitative data to answer the research questions. Barnham (2015) emphasised that to collect and analyse data, qualitative researchers use "participants' observation, in-depth interviews, document analysis, and focus groups". The researcher may ask open-ended questions or use other techniques such as framing, projective techniques, and mapping exercises.

### 3.5.2. Quantitative research

Ben-Eliyahu (cited by Rhodes 2014) noted that the quantitative approach to gathering information focuses on describing a phenomenon across a larger number of participants, thereby providing the possibility of summarising characteristics across groups or relationships. In addition, this approach surveys a large number of participants and applies statistical techniques to recognise overall patterns in the relations of processes. Importantly, the use of surveys can be performed across groups. Tavakol and Sanders (2014) mentioned that quantitative studies are interested in “investigating how and why phenomena vary,” but it is not the same as how and why questions in qualitative research. Quantitative studies use mathematical models and statistics for analysis, providing numerical results that are considered more objective.

Sullivan (cited by Darabi, 2007) mentioned that “when there is little theoretical support for a phenomenon, it may be impossible to develop precise hypotheses, research questions, or operational definitions. In such cases, qualitative research is appropriate because it can be more exploratory in nature.” Furthermore, Malhotra (2010) stated that quantitative analysis is suitable for measuring both attitudes and behaviour. Quantitative research can be used to create models that predict whether or not someone holds a particular opinion or would act in a certain way based on an observable characteristic. Table 3.4 below shows the differences between qualitative and quantitative research:

**Table 3.4: Difference between qualitative and quantitative research**

<b>Criteria</b>	<b>Qualitative Research</b>	<b>Quantitative Research</b>
<b>Purpose</b>	To understand and interpret social interactions.	To test hypotheses, look at cause and effect, and make predictions.
<b>Group Studied</b>	Smaller and not randomly selected.	Larger and randomly selected.
<b>Variables</b>	Study of the whole, not variables.	Specific variables studied.

Criteria	Qualitative Research	Quantitative Research
Type of Data Collected	Words, images, or objects.	Numbers and statistics.
Form of Data Collected	Qualitative data such as open-ended responses, interviews, participant observations, field notes, and reflections.	Quantitative data based on precise measurements using structured and validated data collection instruments.
Type of Data Analysis	Identify patterns, features, themes.	Identify statistical relationships.
Objectivity and Subjectivity	Subjectivity is expected.	Objectivity is critical.
Role of Researcher	Researcher and their biases may be known to participants in the study, and participant characteristics may be known to the researcher.	Researcher and their biases are not known to participants in the study, and participant characteristics are deliberately hidden from the researcher (double-blind studies).
Results	Particular or specialised findings that are less generalisable.	Generalisable findings that can be applied to other populations.
Scientific Method	Exploratory or bottom-up: the researcher generates a new hypothesis and theory from the data collected.	Confirmatory or top-down: the researcher tests the hypothesis and theory with the data.
View of Human Behaviour	Dynamic, situational, social, and personal.	Regular and predictable.

Criteria	Qualitative Research	Quantitative Research
Most Common Research Objectives	Explore, discover, and construct.	Describe, explain, and predict.
Focus	Wide-angle lens; examines the breadth and depth of phenomena.	Narrow-angle lens; tests a specific hypothesis.
Nature of Observation	Study behaviour in a natural environment.	Study behaviour under controlled conditions; isolate causal effects.
Nature of Reality	Multiple realities; subjective.	Single reality; objective.
Final Report	Narrative report with contextual description and direct quotations from research participants.	Statistical report with correlations, comparisons of means, and statistical significance of findings.

**Source:** Johnson and Christensen (2008)

DeFranzo (2011) suggests that the difference between qualitative research and quantitative research is that, qualitative research is primarily exploratory research and used to gain an understanding of underlying reasons, opinions, and motivations. The latter provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research.

Therefore, this study is quantitative in nature and therefore involve collecting and analysing numerical data, employing the use of questionnaires. The questionnaire allows for speedy and straightforward analyses of the raw data.

### 3.5.3. Exploratory research

According to Yin (1994), exploratory studies are a valuable means of understanding what is happening; to seek new insights; to ask questions and to assess phenomenon in a new light. In addition, exploratory research has the goal of formulating problems more precisely,

clarifying concepts, gathering explanations, gaining insight, eliminating impractical ideas and forming hypotheses. Darabi (2007) mentioned that literature research, survey, focus group and case studies are usually used to carry out exploratory research. Darabi (2007) further adds that exploratory research may develop hypotheses, but it does not seek to test them.

#### **3.5.4. Descriptive research**

Huczynski and Buchana (1991) mentioned that when a particular phenomenon is under study, the research is needed to describe it, to clarify and explain its inner relationships and properties. While Robson (2011), noted that the descriptive research portrays an accurate profile of people, events or situations. Descriptive research, in contrast with exploratory research, defines questions, people surveyed, and the method of analysis before beginning of data collection. However, according to Yin (1994), descriptive research should be thought of as a mean to an end, rather than an end, itself.

#### **3.5.5. Explanatory research**

Yin (1994) noted that explanatory research is another research purpose type, and the theory is created to answer why and how questions. Yin (1994) further adds that “explanatory studies go beyond description and attempts to explain the reasons for the phenomenon that the descriptive study only observed. In an explanatory study, the researcher uses theories or hypotheses to represent the forces that caused a certain phenomenon to occur.”

#### **3.5.6. Applied and Basic research**

The main definitions of basic research, applied research, and experimental development are as follows (Frascati, 2002:77):

- **Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view. Applied research is also an original investigation undertaken to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

- **Applied research** is undertaken either to determine possible uses for the findings of basic research or to determine new methods or ways of achieving specific and predetermined objectives. It involves considering the available knowledge and its extension to solve particular problems.

Since there are few studies of this nature aimed at determining the perceived effect of internal control systems on post trade services in selected financial market infrastructures; this study is considered to be applied research as involves considering the available knowledge and its extension to solve particular problems. The study will assist in contributing to the body of knowledge and provide feedback on the perceived effect of the internal controls systems.

### **3.6. VALIDITY AND RELIABILITY**

In this section, attention is given to the reliability and validity of data.

#### **3.6.1. Validity**

According to Burns and Grove (2003:226), validity is defined as a measure of truth or falsity of the data obtained by using the research instrument. It is classified as internal and external validity of the measuring instrument. The validity of a research study is concerned with whether the measurements and the research instrument actually measure what they are intended to quantify Saunders *et al.* (2009). The validity of a research instrument determines “the extent to which the instrument measures what it is designed to measure” (Robson, 2011). It is the degree to which the results are truthful so that it requires a research instrument (questionnaire) to measure the concepts correctly (Pallant, 2011).

#### **3.6.2. Types of validity**

Both Creswell (2009) and Pallant (2011) mentioned that a validity test is divided mainly into four types. They are:

*i. Content Validity:*

Creswell (2009) noted that content validity is the extent to which the questions on the instrument and the scores from these questions represent all possible questions that could be asked about the content or skill. It ensures that the questionnaire includes an adequate set of items that tap the concept. At the same time, Shekaran and Bougie (2010) mentioned that the more the scale items represent the domain of the concept being measured, the greater the content validity.

*ii. Face Validity:*

Allen and Yen (1979) originally suggested that it is considered as a basic and minimum index of content validity, but it is determined after the test is constructed. Leedy and Ormrod (2004) concurred and added that the concepts of content evidence and face validity bear a superficial resemblance, but they are, in fact, quite different.

*iii. Criterion-related Validity:*

According to Burns and Grove (2003), criterion-related validity is used to predict future or current performance. It correlates test results with another criterion of interest. In addition, it deals with the relationship between scale scores and some specific, measurable criterion. Pallant (2011) mentioned that criterion-related validity tests how the scale differentiates individuals on a criterion it is expected to predict.

*iv. Construct Validity:*

Construct validity involves testing a scale in terms of theoretically derived hypotheses concerning the nature of underlying variables or constructs (Pallant, 2011). While Cronbach and Meehl (1955) mentioned that the term 'construct validity' was first formulated by a sub-committee of the American Psychologists Association's Committee on Psychological Tests A construct needs to be both operationalized and syntactically defined to measure it effectively.

Neuman (2014) summarised validity as "absence of self-contradiction". Essentially, validation is related to the extent to which the research method describes what it is supposed to measure. According to Creswell (2009:128), peer review is the review of the data and research process by someone familiar with the research or the phenomena being explored.

In addition, a peer reviewer provides support, plays devil's advocate, challenges the researcher's assumptions, pushes the researcher to the next step, and asks in-depth questions about methods and interpretations. The research questionnaire was sent to the Senior Manager at Institution X for peer review to ensure the validity of the research instrument. The following points were considered to ensure the validity and measurability of the research:

- The appropriate time scale for the study was selected;
- The appropriate methodology was chosen, taking into account the characteristics of the study;
- The most suitable sample method for the study was selected;
- The participants were not pressured in any way to select specific choices among the answer sets; and
- The researcher's goals and objectives were clearly defined and understandable by participants.

### **3.6.3. Reliability**

According to Bryman and Bell (2011), reliability in a research study is concerned with whether the outcomes of the study would be steady if the study would remain unchanged, and if the study were to be conducted again using the same data and methodology. Reliability can be defined as the degree to which measurements are free from error and, therefore, give inconsistent results. Thus, reliability concerns the extent to which an experiment, test, or any measuring procedure yields the same results on repeated trials internal consistency involves correlating the responses to each question in the questionnaire with those to other questions in the questionnaire (Saunders *et al.*, 2009).

Although there are a variety of methods for calculating internal consistency, of which one of the most frequently used is Cronbach's coefficient alpha, which is the degree of intercorrelations among the items that constitute a scale. The reliability of the measuring instruments was assessed with the use of Cronbach alpha coefficient. A reliability of 0.60 and 0.70 or above is considered to be the criteria for demonstrating internal consistency of new scales and established scales, respectively (Nunnally, 1988, in Field, 2013:618).

This study calculated the Cronbach's coefficient alpha (see par. 4.2.2) to ensure that the data were reliable. Alpha coefficients of 0.70 portrays a reliable dataset (Field, 2013:619).

### **3.7. ETHICAL CONSIDERATIONS**

According to Bryman and Bell (2011), the ethical aspect of data collection is frequently a critical thought for researchers in depicting how and why information is gathered. A potential ethical issue that can arise when using secondary data is that it could wind up being utilised as a part of a way which it was not at first intended to or bring up issues concerning the legal rights of using the data. Researchers should always remember that while they are doing their research, they are entering the private spaces of their participants. Understandably, this raises several ethical issues that should be addressed during, and after the research had been conducted.

Creswell (2009) states that the researcher should respect the rights, needs, values and desires of the informants, and they listed several issues that researchers should consider when analysing data. They caution researchers to be aware of these and other issues before, during, and after the research had been conducted. Some of the problems involve the following:

- Informed consent (Do participants have full knowledge of what is involved?);
- Harm and risk (Can the study hurt participants?);
- Honesty and trust (Is the researcher being truthful in presenting data?);
- Privacy, confidentiality, and anonymity (Will the study intrude too much into group behaviours?); and
- Intervention and advocacy. (What should researchers do if participants display harmful or illegal behaviour?).

The researcher firstly obtained ethical clearance from the North-West University prior to issuing the questionnaire to Institution X. The researcher requested Institution X to permission provide conduct research. The questionnaires sent to the research participants clearly stated that participating in the research is voluntary, and the response provided by the participants was treated with absolute confidentiality and privacy. The participants in the

study are informed not to disclose their personal details when responding to the questionnaires. The participants are requested when completing the questionnaire to present honest and trustworthy responses. The researcher also stated in the questionnaire that the nature of the research is not to cause any harm.

### **3.8. CHAPTER SUMMARY**

In this chapter, attention was given to the philosophical underpinnings of the research process. The researcher began by defining the theoretical paradigms and then highlighted the five components of a paradigm. The researcher then introduced the two broad approaches to research being positivist and interpretive paradigm. Some attention was also given to elaborating on the difference between positivist and interpretive paradigm. Based on the differences noted, it was noted that this study used the positivist paradigm as it was aimed at uncovering objective results through the use of the questionnaire.

The discussion then proceeded to discuss the research design and method considered in the research. It was noted that the research design of this study employed scientific methods to collect and analyse data. It was further added that this study used the Survey Monkey as data collection methods to allow for quantitative data that can be easily analysed and assist in easy-to-create graphical presentations. The research instrument was also discussed in this chapter, where it was noted that the information would be collected through self-administered questionnaires using the automated research tool Survey Monkey.

The researcher then proceeded to discuss the population and sampling considered in the study. It was described that a population comprising of all groups, objects, subjects or observations relating to a specific area of interest of a research project. The population of this study is all the South African Financial Market Infrastructures. To be more specific, the population in this is all the participants employed and considered to have experience and exposure to post trade services internal control systems at Institution X. On to sampling, this chapter describes sampling as a process that involves selecting a representative sample from a population in order to express an opinion about the population. The sampling considered in this study is employed in post trade services unit at Institution X.

The different sampling methods found in the sampling were also discussed in the chapter, and these are probability sampling and non-probability sampling. Based on the arguments presented between the two sampling methods, the non-probability sampling method was used to fulfil the objectives of this study as Burns and Grove (2003:804), does not envisage that every element in the population has an opportunity of being selected from the population.

The discussion in the chapter then proceeded to introduce the types of research. These were named as qualitative research, quantitative research, exploratory research, descriptive research, explanatory research and applied and basic research. Based on the arguments presented into these types of researches, the researcher concluded that this study is quantitative in nature and considered to be applied research.

Then attention was given to the reliability and validity of data in the chapter. Where validity was defined as a measure of truth or falsity of the data obtained through using the research instrument and reliability can be defined as the degree to which measurements are free from error and, therefore, give inconsistent results. It was then noted that this study used a Cronbach's Alpha as a measuring instrument to ensure that the results obtained are reliable. Lastly, the ethical considerations applied in performing this study were also addressed. The chapter that follows explores and evaluates the results of the perceived effect of the internal control system through analysis of the acquired results in an attempt to address SO4.

## **CHAPTER 4**

### **RESEARCH FINDINGS**

#### **4.1. INTRODUCTION**

This chapter presents the empirical findings of the study. In doing so, the following secondary objective of the study (chapter one, paragraph 1.9.2) is addressed:

*SO4: Evaluate the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures through analysis of the acquired results.*

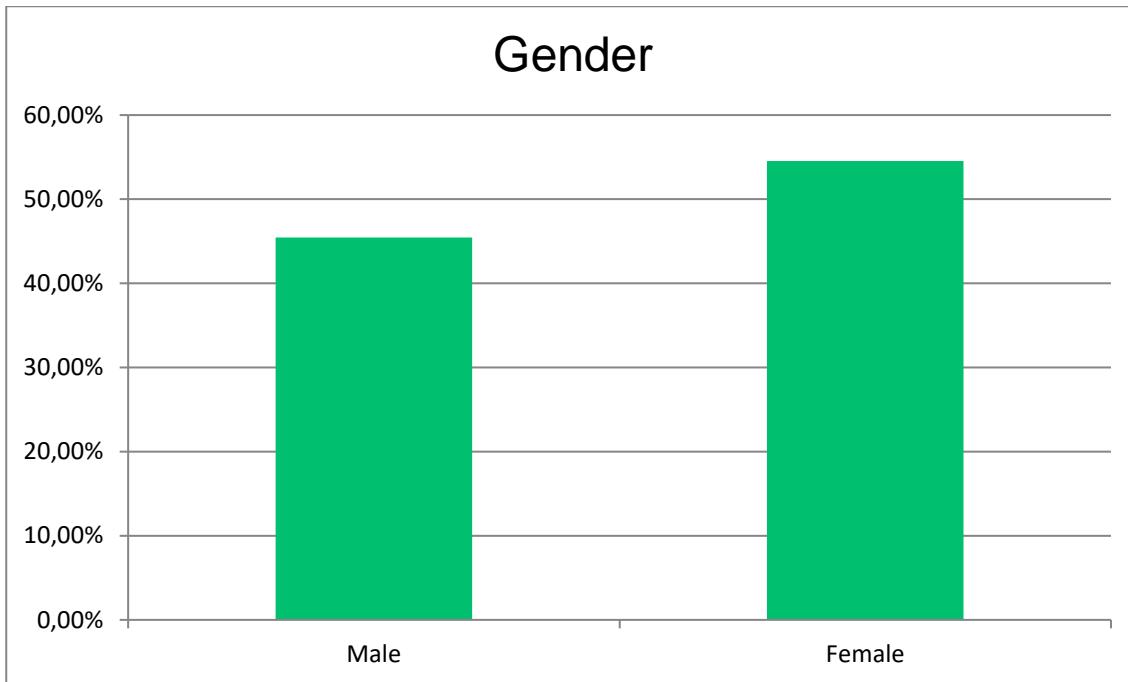
#### **4.2 RESULTS**

The results consist of a demographic profile of the respondents, the reliability of the data, and the responses to the Likert-scaled questions in each of the five parts in the questionnaire.

##### **4.2.1 Demographic profile**

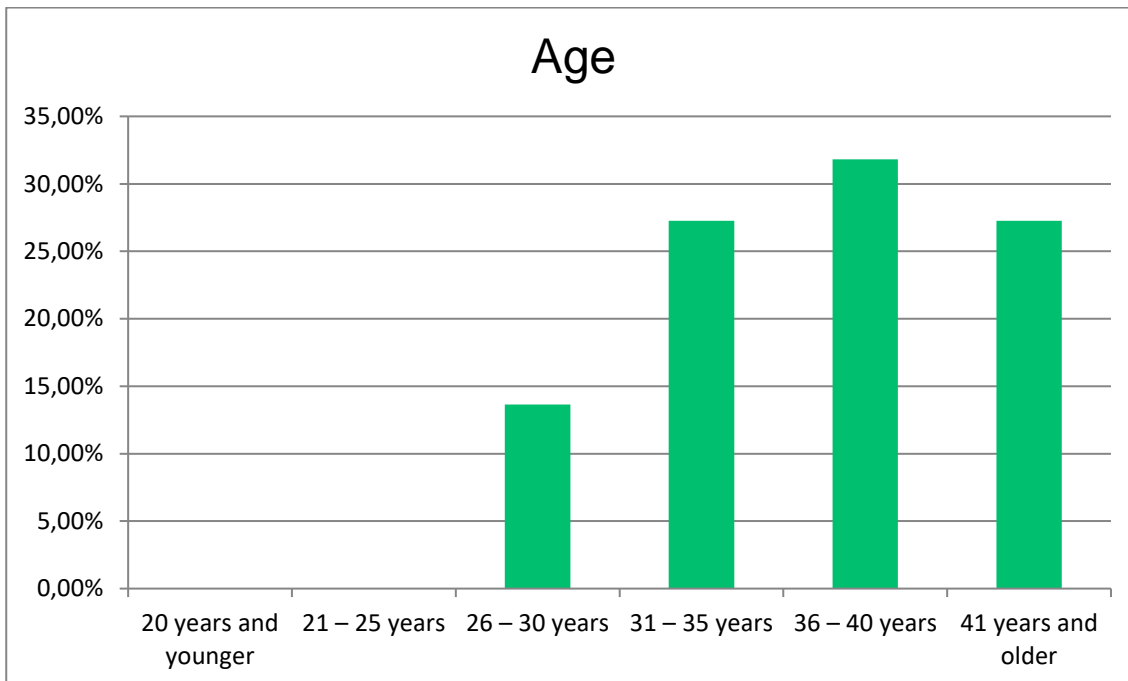
The demographic profile of the respondents consists of five descriptors, namely gender, age, highest qualification, employment level and the years of experience of the respondents. These results are presented for future use and comparability. These results are shown in Figures 4.1 to 4.5.

**Figure 4.1: Gender**



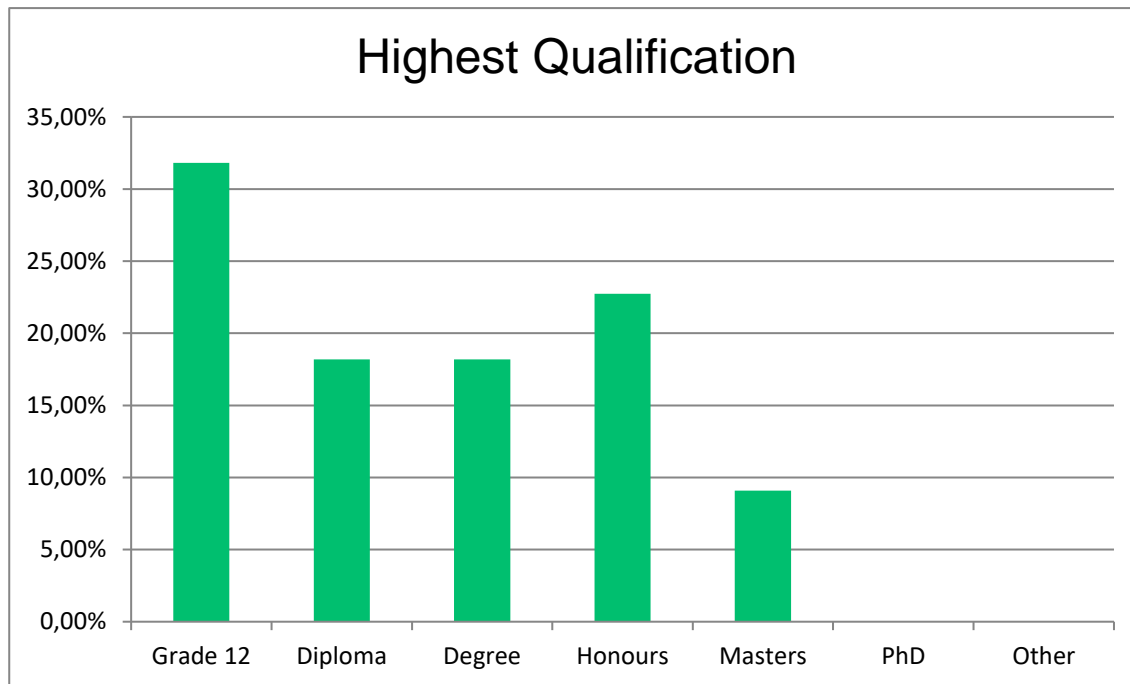
The respondents are relatively equally distributed across gender, albeit a little more woman than men completed the questionnaire (55%).

**Figure 4.2: Age**



None of the respondents is younger than 16 years. The age profile shows a more mature respondent profile with more than 75% of the respondents being older than 30 years, and almost 30% of them are older than 40.

**Figure 4.3: Highest qualification**



More than 65% of the respondents have some form of post-school education. Albeit none having a doctorate, almost 10% do have a Master's degree. In comparison, there are more than 20% who have an honours degree, and nearly 20% of them also have a university degree as the highest qualification.

**Figure 4.4: Employment level**

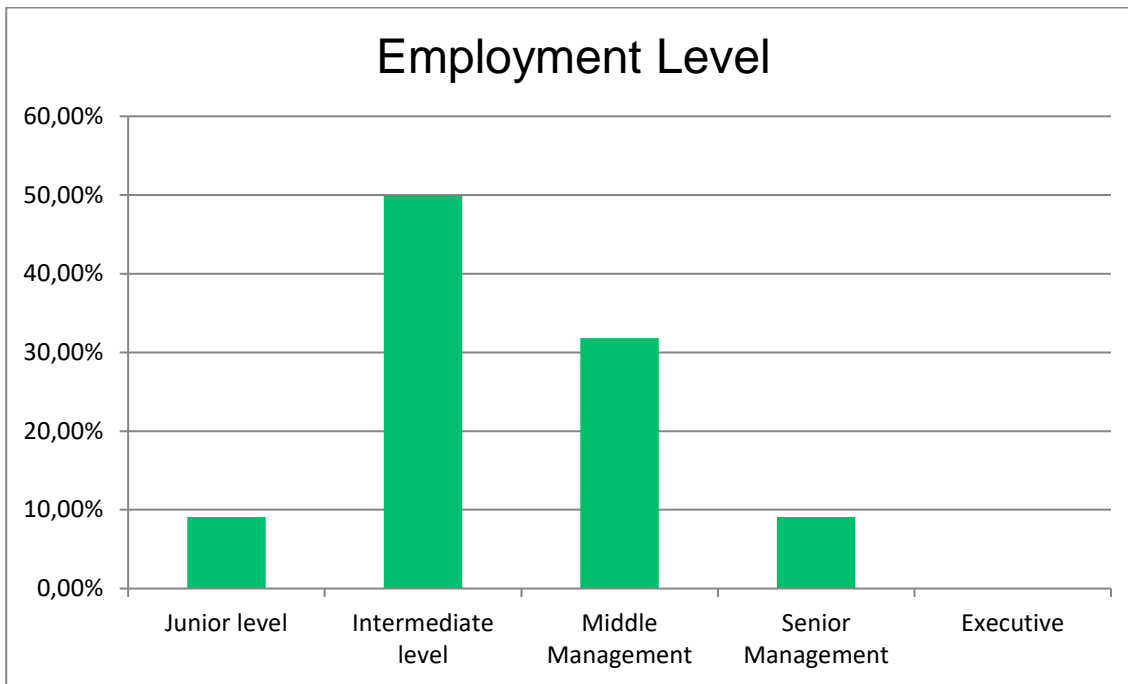


Figure 4.4 shows that the majority of respondents occupied intermediate (50%) and middle management level (32%) positions. The lowest responses were from the senior management and junior level, both at 9%. Interestingly, the executive level did not respond to the survey. The responses suggest good coverage from the various levels of post trade services (except the executive level), and it is postulated that bias in the results, based on managerial levels, is limited.

**Figure 4.5: Years of experience**

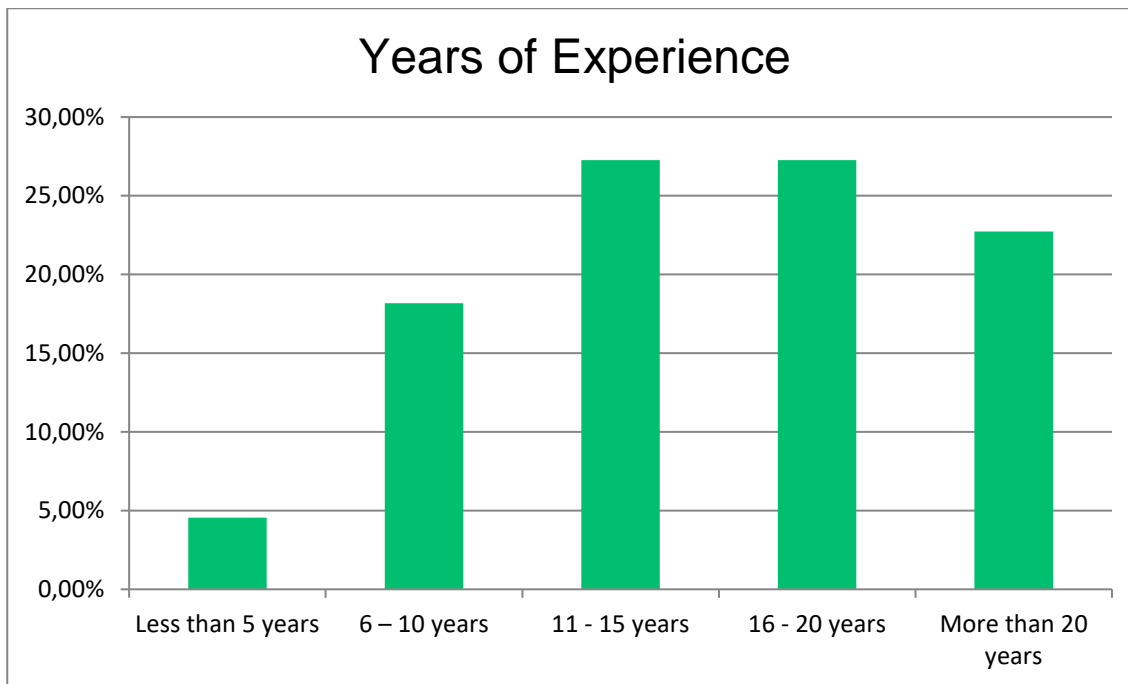


Figure 4.5 above depicts the respondents' years of experience in post trade services department. The majority of respondents are well experienced in post trade services with over eleven (11) years of experience. This represents 78% (11 – 15: 27%; 16 – 20: 27% and 20+: 24%). The number of respondents with less than five (5) years of experience was 4%, while 18% of the respondents only had 6 – 10 years of experience. From the analysis, it seems that the respondents are well experienced in post trade services.

In summary, the demographic profile shows that more women than men completed the questionnaire. More than 65% of the respondents do have a post-school education, and half of the respondents are on an intermediate management level. The respondents are well experienced, and very few of them (<5%) have fewer than five years of working experience.

#### **4.2.2 Reliability of the data**

Cronbach's coefficient alpha determines the reliability of the data; this coefficient should exceed 0.70 to signify a reliable and internally consistent dataset. The results appear in Table 4.1

**Table 4.1: Reliability of the data**

Reliability Statistics	
Cronbach's Alpha	N of Items
.921	30

The analysis shows that the data is highly reliable, with an alpha coefficient of 0.91. This means that the data is suitable for analysis (Field, 2013:777) and that the results should also be reliable and fit for use.

### 4.2.3 Post trade services

The five functions of post trade services under investigation are the *Control activities*, *Risk assessment*, *Information and communication*, *Control environment* and the *Monitoring services*. These functions are separately analysed as dealt with in the questionnaire. These results appear in Tables 4.2 to 4.6. Each table shows the mean, standard deviation and skewness of each of the questions about the specific function. The mean value serves as the primary indicator. In the 4-point Likert scale, the midpoint is 2.5. This means that all mean values per question that exceeds the midpoint of 2.5, indicate the respondents agree to the biggest extent with the question.

In contrast, those questions with mean values below the midpoint indicate that the respondents disagree to the biggest extent with the question. The standard deviation is the second measure to interpret the results. Where deviations of 1 or more are present, this indicates that the respondents are not in agreement concerning the specific question. Hence, there were differing views (Rehman *et al.*, 2019:189). Finally, as the third measure, the skewness of the results is also shown. Skewness refers to the extent to which the specific question's distribution differs from a normal distribution. Here scores below -1 or above +1 indicate a high level of skewness (Brown, 2020).

**Table 4.2: Control activities**

Statistics									
		A1 Post trade services department has sufficient policies and procedures addressing acceptable business practice.	A2 Policy and procedure manuals document all-important key activities performed in the post trade services department.	A3 Policies and procedures of post trade services department are reviewed and updated on a regular basis.	A4 Management reviews the functioning of internal controls system that exist in the post trade services department.	A5 Training on internal controls relating to post trade services department is provided to staff to discharge their responsibilities diligently.	A6 Management closely monitors implementation of internal control systems in the post trade services department.	A7 Appropriate segregation of duties exists in the post trade services department when it comes to internal control system.	A8 Appropriate approvals from management are required prior to allowing transactions in the post trade services department.
N	Valid	22	22	22	22	22	22	22	22
	Missing	0	0	0	0	0	0	0	0
Mean		3.18	3.18	3.00	3.05	2.59	2.86	2.73	3.23
Std. Deviation		.664	.588	.756	.653	.734	.560	.703	.612
Skewness		-.212	-.025	.000	-.042	.847	-.074	.442	-.142
Std. Error of Skewness		.491	.491	.491	.491	.491	.491	.491	.491

**Table 4.3: Risk assessment**

<b>Statistics</b>					
		B1 Post trade services department identifies risks to the achievement of overall objectives.	B2 Post trade services department involve the appropriate levels of expertise in the company to identify risks to achieving its objectives.	B3 The post trade services department considers risks from external and internal sources in setting goals and objectives for the department.	B4 The post trade services department take necessary action to manage risks identified.
N	Valid	22	22	22	22
	Missing	0	0	0	0
Mean		3.05	3.05	3.09	3.36
Std. Deviation		.653	.575	.811	.658
Skewness		-.042	.014	-.764	-.547
Std. Error of Skewness		.491	.491	.491	.491

**Table 4.4: Information and communication**

		<b>Statistics</b>					
		C1 The post trade services department internally communicates information necessary to support the functioning of internal control.	C2 The post trade services department communicates with external parties regarding matters affecting the functioning of internal control.	C3 Management is provided with timely, reliable and relevant information on the functioning of internal control for post trade services.	C4 A process is established and communicated to employees about how to communicate suspected instances of wrongdoing regarding the functioning of internal control.	C5 There is training/orientation in place for new employees to discuss the nature and scope of their duties and responsibilities relating to post trade services.	C6 Post trade services department has written job descriptions that describe the duties of personnel, including their internal control responsibilities.
N	Valid	22	22	22	22	22	22
	Missing	0	0	0	0	0	0
Mean		2.73	2.73	2.95	2.82	2.55	2.91
Std. Deviation		.827	.935	.722	.853	.800	.811
Skewness		.018	-.162	.069	-.130	-.162	-.414
Std. Error of Skewness		.491	.491	.491	.491	.491	.491

**Table 4.5: Control environment**

		<b>Statistics</b>					
		D1 The post trade services department has a code of conduct.	D2 The code of conduct is distributed to all employees to acknowledge their understanding.	D3 The post trade services department has policies addressing conflicts of interest.	D4 Post trade services department employees are required to annually acknowledge that they have read, understood, and complied with the code of conduct.	D5 The level of competence and the requisite knowledge and skills are defined for each job in the post trade services department.	D6 Job descriptions are in place for all employees in the post trade services department.
N	Valid	22	22	22	22	22	22
	Missing	0	0	0	0	0	0
Mean		2.59	2.41	2.95	2.41	2.95	3.36
Std. Deviation		1.008	1.008	.785	1.098	.653	.581
Skewness		-.273	-.034	.083	.017	.042	-.212
Std. Error of Skewness		.491	.491	.491	.491	.491	.491

**Table 4.6: Monitoring activities**

		<b>Statistics</b>					
		E1 Post trade services department has suitable monitoring processes in place to assess whether controls across the internal control systems are functioning as intended.	E2 The post trade services department relies on exception reports to monitor the effectiveness of internal controls system.	E3 The post trade services department relies on the internal audit department for monitoring of internal controls system.	E4 The post trade services department relies on customer feedback to identify internal control weaknesses.	E5 Post trade services department has a process in place used to monitor when internal controls are overridden.	E6 Post trade services department has a process in place to track unremediated control weaknesses.
N	Valid	22	22	22	22	22	22
	Missing	0	0	0	0	0	0
Mean		2.91	2.91	2.59	2.23	2.45	2.50
Std. Deviation		.684	.684	.908	1.020	.671	.802
Skewness		.114	.114	-.297	.386	.181	.000
Std. Error of Skewness		.491	.491	.491	.491	.491	.491

The results in Tables 4.2 to 4.6 shows that the distribution is acceptable because none of the questions had significant skewness. The other secondary measure, the standard deviation, also indicated that the respondents were in general agreement concerning the questions. Also, here none of the questions had standard deviations larger than one.

Regarding *Part A: Control activities* (Table 4.2), the mean values show that questions A1, A2, A3, A4 and A8 all exceed the midpoint of 2.5 comfortably; this shows that the respondents are strongly in agreement with the questions. In other words, respondents strongly agree that post trade services have sufficient policies and procedures addressing acceptable business practice. Also, respondents strongly agree that the policy and procedure manuals document all-important key activities performed in the post trade services department. In addition, respondents strongly agree that the policies and procedures of post trade services department are reviewed and updated on a regular basis. Furthermore, respondents strongly agree that management reviews the functioning of internal controls system that exists in the post trade services department. Moreover, respondents strongly agree that appropriate approvals from management are required prior to allowing transactions in the post trade services department. However, question A6 and A7; all have mean values of between 2.5 and 3. This indicates that although respondents do agree, they are not in strong agreement with these specific questions. Here specifically question A5 that deals with the training on the control activities (2.59) scores a mean that is marginally above the midpoint.

In *Part B: Risk assessment* (Table 4.3), the mean values show that questions B1, B2, B3 and B4 all exceed the midpoint of 2.5 comfortably; this shows that the respondents are strongly in agreement with the questions. In other words, respondents strongly agree that post trade services department identifies risks to the achievement of overall objectives. In addition, respondents strongly agree that post trade services department involve the appropriate levels of expertise in the company to identify risks to achieving its objectives. Also, respondents strongly agree that post trade services department considers risks from external and internal sources in setting goals and objectives for the department. Moreover, respondents strongly agree that post trade services department take necessary action to manage risks identified.

In *Part C: Information and communication* (Table 4.4), the mean values show that with regards to question C1, C2, C3, C4 and C6; they all have mean values of between 2.5 and 3, which means respondents agree to the questions but are not in strong agreement with the questions. In other words, respondents were not in strong agreement that post trade services department internally communicates information necessary to support the functioning of internal control. Furthermore, respondents were not in strong agreement that post trade services department communicates with external parties regarding matters affecting the functioning of internal control. In addition, respondents were not in strong agreement that management is provided with timely, reliable and relevant information on the functioning of internal control for post trade services. Also, respondents were not in strong agreement that a process is established and communicated to employees about how to communicate suspected instances of wrongdoing regarding the functioning of internal control. Additionally, respondents were not in strong agreement that post trade services department has written job descriptions that describe the duties of the personnel, including their internal control responsibilities.

Question C5 has a mean score of 2.55. This means that the respondents were in marginal agreement that there is training and orientation in place for new employees to discuss the nature and scope of their duties and responsibilities relating to post trade services.

In *Part D: Control environment* (Table 4.5), firstly for question D6, the mean values exceed the midpoint of 2.5 comfortably with a score of 3.36. This means that respondents strongly agree that the level of competence and the requisite knowledge and skills are defined for each job in the post trade services department. Meanwhile, as it relates to question D1, D3 and D5; all have mean values are between 2.5 and 3. This indicates that although respondents do agree to the question, they are not in strong agreement with these specific questions. This means that respondents are not in strong agreement that post trade services department has a code of conduct. In addition, respondents are not in strong agreement that post trade services department has policies addressing conflicts of interest. Furthermore, respondents are not in strong agreement that there is a level of competence and the requisite knowledge and skills defined for each job in the post trade services department.

In so far as question D2 and D4 is concerned, the mean values of (2.41); shows that respondents are not in agreement with the questions. This means that respondents disagree that there is a code of conduct distributed to all employees to acknowledge their understanding. In addition, respondents do not agree that post trade services department employees are required to annually acknowledge that they have read, understood, and complied with the code of conduct.

In *Part E: Monitoring activities* (Table 4.6), the mean values show that in relation to question E1, E2 and E3; all have mean values of between 2.5 and 3. This indicates that although respondents agree with the question, they are not in strong agreement with these specific questions. This means that respondents are not in strong agreement that post trade services department has a suitable monitoring process in place to assess whether controls across the internal control systems are functioning as intended. Also, respondents are not in strong agreement that post trade services department relies on exception reports to monitor the effectiveness of internal controls system. Moreover, respondents are not in strong agreement that post trade services department relies on the internal audit department for monitoring of internal controls system.

Meanwhile, question E4, E5 and E6, mean values are between 2.23 and 2.50; which shows that respondents are not in agreement with the questions. This means that respondents do not agree that post trade services department relies on customer feedback to identify internal control weaknesses. Furthermore, respondents do not agree that post trade services department has a process in place used to monitor when internal controls are overridden. Moreover, respondents are not in agreement that job descriptions are in place for all employees in the post trade services department.

The summary results of the five parts appear in Table 4.7.

**Table 4.7: Summary statistics of functions (as per Parts A to E)**

Statistics						
		Control Activities	Risk Assessment	Information Communications	Control Environment	Monitor Activities
N	Valid	22	22	22	22	22
	Missing	0	0	0	0	0
Mean		2.9773	3.1364	2.7803	2.7803	2.5985
Std. Deviation		.43239	.59124	.54769	.60725	.51859
Skewness		.351	-.656	.053	-.005	-.090
Std. Error of Skewness		.491	.491	.491	.491	.491

The results show that the distribution of the data of all five functions of the post trade services department is within normal skewness parameters ( $-1 \geq S \leq 1$ ). The respondents are also in agreement concerning the specific parts; none of the standard deviations exceeds one. Concerning the mean values, there are, however, interesting indicators from the mean values. The respondents agree strongly with the Risk assessment (3.13) and the Control activities (2.98) at the department but marginally agree with the Information communication (2.78) and Control Environment (2.78). They are at the midpoint with the Monitoring activities at the department, neither agreeing nor disagreeing with this function.

### 4.3 SUMMARY

In this chapter data was collected from the questionnaire and analysed. The aim was to evaluate the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures. The findings from the data were presented and analysed.

The demographic profile of the respondents was analysed, and the following was noted. Some 55% of women completed the questionnaire than men with 45%. More than 65% of the respondents do have a post-school education, and 50% of the respondents who completed the questionnaire are on an intermediate management level. The respondents are well experienced, with 78% of them having over 11 years of work experience, and very few of them (<5%) have fewer than five years of working experience.

With regard to control activities, the respondents strongly agreed that post trade services department has sufficient policies and procedures addressing acceptable business practice. In addition, the respondents strongly agreed that there are a policy and procedure manuals which document all-important key activities performed in the post trade services department. Also, respondents strongly agreed that policies and procedures of post trade services department are reviewed and updated on a regular basis. Furthermore, respondents strongly agreed that management reviews the functioning of the internal controls system that exists in the post trade services department.

Regarding risk assessment, the respondents strongly agree that post trade services department identifies risks to the achievement of overall objectives. Besides, respondents strongly agree that post trade services department involve the appropriate levels of expertise in the company to identify risks to achieving its objectives. Moreover, respondents strongly agree that post trade services department take necessary action to manage risks identified.

In terms of information and communication, respondents were not in strong agreement that post trade services department internally communicates information necessary to support the functioning of internal control. Furthermore, respondents were not in strong agreement that post trade services department communicates with external parties regarding matters affecting the functioning of internal control. Also, respondents were not in strong agreement that that management is provided with timely, reliable and relevant information on the functioning of internal control for post trade services. Also, respondents were not in strong agreement that a process is established and communicated to employees about how to communicate suspected instances of wrongdoing regarding the functioning of internal control. Additionally, respondents were not in strong agreement that post trade services department has written job descriptions that describe the duties of the personnel, including their internal control responsibilities.

With regards to the control environment, respondents strongly agree that the level of competence and the requisite knowledge and skills are defined for each job in the post trade services department. However, on the other hand, respondents do not agree that there is a code of conduct distributed to all employees to acknowledge their understanding. In addition, respondents do not agree that post trade services department employees are required to annually acknowledge that they have read, understood, and complied with the code of

conduct. Also, respondents are not in strong agreement that post trade services department has a code of conduct. Also, respondents are not in strong agreement that post trade services department has policies addressing conflicts of interest.

As it relates to monitoring activities, respondents do not agree that post trade services department relies on customer feedback to identify internal control weaknesses. Furthermore, respondents disagree that post trade services department has a process in place used to monitor when internal controls are overridden. Moreover, respondents are not in agreement that job descriptions are in place for all employees in the post trade services department. In addition, respondents are not in strong agreement that post trade services department has a suitable monitoring process in place to assess whether controls across the internal control systems are functioning as intended. Also, respondents are not in strong agreement that post trade services department relies on exception reports to monitor the effectiveness of the internal controls system. Moreover, respondents are not in strong agreement that post trade services department relies on the internal audit department for monitoring of internal controls system.

It is clear from the findings of the study that numerous factors are present which prevent Institution's X from having sound internal controls systems effect on post trade services. The latter concerns should be addressed if the department is to have sound internal control systems.

The next chapter summarises the study and concludes the research objectives of the study. It is also the final chapter of the study.

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 INTRODUCTION

In this chapter, the researcher discusses the areas for future research and revisits the research objectives as outlined in chapter one (par. 1.9) and concludes on the main research objectives of the study which was to:

*PO1: Evaluate the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures.*

The primary objective was achieved through the following formulated secondary objectives which were addressed in the various proceeding chapters: (see also Chapter one par.1.9 and other parts of the study where these objectives were addressed):

*SO1: Defining the internal control system and financial markets infrastructures internal control system process (see chapter two).*

*SO2: Identify, assess and examine the role and importance of internal control system, post trade services and the principles of financial markets infrastructures (see chapter two).*

*SO3: Identify the research methodology to be applied in this study (see chapter three).*

*SO4: Evaluate the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures through analysis of the acquired results (see chapter four).*

This chapter provides a summary of the findings, formulate conclusions and suggest recommendations to improve the effectiveness of the internal controls systems on post trade

services in financial markets infrastructures. This will assist in meeting the last secondary objective, which is to:

*SO5: Formulate recommendations to improve the effectiveness of the internal controls systems on post trade services in financial markets infrastructures.*

The research question of the study was:

*BRQ: Are the internal controls systems employed in selected financial markets infrastructures perceived to have an effect on post trade services?*

The study showed that internal controls systems employed in selected financial markets infrastructures indeed do have an effect on post trade services. All five functions of post trade services (*Control activities, Risk assessment, Information and communication, Control environment and the Monitoring services*) have an effect on post trade services.

The next section provides a summary of the most pertinent and noteworthy discussions from the proceeding factors.

## **5.2 SUMMARY**

### **5.2.1 SO 1: Defining internal control system and financial markets infrastructures (Chapter two)**

Chapter one argued about the perceived effect that internal control system has on post trade services within selected financial market infrastructures. The chapter outlined limited studies performed to determine the perceived effect that internal control system has on the post trade services within selected financial markets infrastructures. The motivation of the study was that currently, there is a lack of studies focussing specifically on post trade problematics and control. This chapter discussed the primary objective as set out in Chapter 1.

This chapter also presented the problem statement and motivation after looking at studies and literature conducted in the past. The problem statement for this study is based on the vast amount of literature reviewed. It seems as if a study evaluating the perceived effect of internal control systems on post trade services in selected financial market infrastructures

has yet to be performed, specifically in a South African context. However, the internal controls at the post trade services must function effectively. This was followed by the presentation of the research question and the research objectives for the study.

The next section discusses the role and importance of internal control systems, post trade services and financial markets infrastructures.

### **5.2.2 SO 2: Identify, assess and examine the role and importance of internal control system, post trade services and the principles of financial markets infrastructures (Chapter two)**

Chapter two commenced by presenting literature on the definition of internal control systems where it was mentioned that internal control systems are a process affected by management and employees aimed at ensuring the achievement of organisations goals and objectives. The internal control systems process was also discussed where the five elements of internal control were presented. These elements are control environment, risk assessment, control activities, information and communication and monitoring activities.

The chapter also provided an overview and principles of financial market infrastructures. From the literature discussion, we learned that financial markets infrastructures are multidimensional system which consists of various financial participants. Essentially financial markets infrastructures facilitate recording, clearing, netting and settlement of monetary transactions involved in the financial system. Moreover, financial markets infrastructures are critical to maintaining and preserving financial stability. In addition, financial markets infrastructures play a pivotal role in the broader economy in ensuring that costs and risks are minimised. Important to also note that financial market infrastructures manage these risks through the establishment of internal control processes (i.e. principles, rules, procedures and ensuring that there is an appropriate risk management framework in place).

This literature chapter also presented types of financial markets infrastructures. These are the payments system, central securities depository, securities settlement systems, central counterparty and trade repositories. The 24 principles for the financial markets infrastructures were also discussed in the chapter. These principles are essential within the

financial market infrastructure to ensure the risks posed in the environment are appropriately managed. It can be mentioned that these principles are controls put in place by the financial market infrastructure to ensure that goals and objectives are achieved. The researcher also notes that post trade services are embedded in the financial market infrastructures. Therefore, it is essential for providers of post trade services to adhere to the applicable principles of financial market infrastructures to manage risks facing the environment. This is an important aspect as post trade services are vital in maintaining an efficient and stable financial system to the interest of investors.

The next section discusses the research methodology followed and applied for this study.

### **5.2.3 SO 3: Identify the research methodology to be applied in this case study (Chapter three)**

In this chapter, attention was given to the philosophical underpinnings of the research process. The researcher began by defining the theoretical paradigms and then highlighted the five components of a paradigm. The researcher then introduced the two broad approaches to research being positivist and interpretive paradigm. Some attention was also given to elaborating on the difference between positivist and interpretive paradigm. Based on the differences noted, it was noted that this study used the positivist paradigm as it was aimed at uncovering objective results through the use of the questionnaire.

The discussion then proceeded to discuss the research design and method considered in the research. It was noted that the research design of this study employed scientific methods to collect and analyse data. It was further added that this study used the Survey Monkey as data collection methods to allow for quantitative data that can be easily analysed and assist in easy-to-create graphical presentations. The research instrument was also discussed in this chapter, where it was noted that the information would be collected through self-administered questionnaires using the automated research tool Survey Monkey.

The researcher then proceeded to discuss the population and sampling considered in the study. It was described that a population comprising of all groups, objects, subjects or observations relating to a specific area of interest of a research project. The population of this study is all the South African Financial Market Infrastructures. To be more specific, the

population in this is all the participants employed and considered to have experience and exposure to post trade services internal control systems at Institution X. On to sampling, this chapter describes sampling as a process that involves selecting a representative sample from a population to express an opinion about the population. The sampling considered in this study employed in post trade services unit at Institution X.

The different sampling methods found in the sampling were also discussed in the chapter. These are probability sampling and non-probability sampling. Based on the arguments presented between the two sampling methods, the non-probability sampling method was used to fulfil the objectives of this study as Burns and Grove (2003:804), does not envisage that every element in the population has an opportunity of being selected from the population.

The discussion in the chapter then proceeded to introduce the types of research. These were named as qualitative research, quantitative research, exploratory research, descriptive research, explanatory research and applied and basic research. Based on the arguments presented into these types of researches, the researcher concluded that this study is quantitative in nature and considered to be applied research.

The next section provides a summary of the findings, as discussed in chapter 4 above.

#### **5.2.4 SO 4: Evaluate the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures through analysis of the acquired results (Chapter four)**

In this chapter, data was collected from the questionnaire and analysed. The aim was to evaluate the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures. The findings from the data were presented and analysed.

With regard to control activities, the respondents strongly agreed that the post trade services department has sufficient policies and procedures addressing acceptable business practice. In addition, the respondents strongly agreed that there are a policy and procedure manuals which document all-important key activities performed in the post trade services department.

Also, respondents strongly agreed that policies and procedures of post trade services department are reviewed and updated regularly. Furthermore, respondents strongly agreed that management reviews the functioning of the internal controls system that exists in the post trade services department.

Regarding risk assessment, the respondents strongly agree that post trade services department identifies risks to the achievement of overall objectives. In addition, respondents strongly agree that post trade services department involve the appropriate levels of expertise in the company to identify risks to achieving its objectives. Moreover, respondents strongly agree that post trade services department take necessary action to manage risks identified.

In terms of information and communication, respondents were not in strong agreement that post trade services department internally communicates information necessary to support the functioning of internal control. Furthermore, respondents were not in strong agreement that post trade services department communicates with external parties regarding matters affecting the functioning of internal control. In addition, respondents were not in strong agreement that that management is provided with timely, reliable and relevant information on the functioning of internal control for post trade services. Also, respondents were not in strong agreement that a process is established and communicated to employees about how to communicate suspected instances of wrongdoing regarding the functioning of internal control. Additionally, respondents were not in strong agreement that post trade services department has written job descriptions that describe the duties of the personnel, including their internal control responsibilities.

With regards to the control environment, respondents strongly agree that the level of competence and the requisite knowledge and skills are defined for each job in the post trade services department. However, on the other hand, respondents do not agree that there is a code of conduct distributed to all employees to acknowledge their understanding. Besides, respondents do not agree that post trade services department employees are required to annually acknowledge that they have read, understood, and complied with the code of conduct. Also, respondents are not in strong agreement that post trade services department has a code of conduct. In addition, respondents are not in strong agreement that post trade services department has policies addressing conflicts of interest.

As it relates to monitoring activities, respondents do not agree that the post trade services department relies on customer feedback to identify internal control weaknesses. Furthermore, respondents disagree that the post trade services department has a process in place used to monitor when internal controls are overridden. Moreover, respondents are not in agreement that job descriptions are in place for all employees in the post trade services department. In addition, respondents are not in strong agreement that the post trade services department has a suitable monitoring process in place to assess whether controls across the internal control systems are functioning as intended. Also, respondents are not in strong agreement that the post trade services department relies on exception reports to monitor the effectiveness of the internal controls system. Moreover, respondents are not in strong agreement that the post trade services department depends on the internal audit department for monitoring of the internal controls system.

The next section outlines the recommendations to improve the effect that internal controls systems have on post trade services in selected financial markets infrastructures

### **5.3 RECOMMENDATIONS**

Based on the findings of the study, the following recommendations can be made to improve the effect of the internal controls systems on post trade services in selected financial markets infrastructures.

- Management must ensure that the department has an adequate training program for employees and provide necessary training to all post trade employees on internal controls to discharge their responsibilities diligently. This will improve the control activities of the department by ensuring that policies, procedures and general rules and organisation set up by management are duly followed.
- Management must broadly distribute information throughout the organisation to ensure that critical information is delivered to the right staff in a timely way. This will ensure that the post trade services department internally communicates information necessary to support the functioning of internal control.

- Management must establish relevant and reliable information systems to track operations, goal progress, and compliance. This will ensure that post trade services department communicates with external parties regarding matters affecting the functioning of internal control.
- Management must establish both outgoing and incoming lines of communication with external entities. This will ensure that management is provided with timely, reliable and relevant information on the functioning of internal control for post trade services.
- Management must establish separate lines of communication, such as fraud and ethics hotlines, for confidential information. Inform employees of these separate reporting lines, how they operate, and how reports are handled. This will ensure that a process is established and communicated to employees about how to communicate suspected instances of wrongdoing regarding the functioning of internal control.
- Management must set the correct tone at the top by implementing and promoting ethical standards, code of conduct, integrity, and accountability policies. In addition, management must set mission, goals and objectives, so the organisation knows what it is to accomplish. This will ensure that post trade services department has a code of conduct and policies addressing conflicts of interest.
- Management must ensure that written job descriptions exist, that clearly state responsibility for internal control, and correctly translate desired competence levels into requisite knowledge, skills, and experience. This will improve the level of competence and the requisite knowledge and skills defined for each job in the post trade services department.
- Management must establish a system of quality control over all processes such as supervisory reviews, approvals, and automated exception checks.
  - Conduct routine reviews of actual performance compared to goals and budgets;
  - Conduct separate management reviews of a function to determine whether it is working as intended, or controls need to be redesigned.

This will also ensure that post trade services department has a suitable monitoring process in place used to monitor when internal controls against goals set. In addition, a good monitoring process helps ensure that control activities and other planned actions to affect internal controls are carried out properly and in a timely manner sufficient to ensure that the end result is effective internal controls.

The above recommendations should assist in improving the effectiveness of the internal controls systems on post trade services in financial markets infrastructures. It can, therefore, be concluded that SO 5 has been met.

#### **5.4 AREAS FOR FUTURE RESEARCH**

This study focused only on the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures. Therefore, further studies that can be considered for future research are:

- A study could be conducted to evaluate the perceived effect of the internal controls systems on other financial markets infrastructures with focus on a larger sample size.
- The contribution of automated internal controls on post trade services for financial market infrastructures can also be investigated.
- Another possibility is a study to evaluate the relationship between internal control systems employed at post trade services and financial performance for financial market infrastructures.

#### **5.5 LIMITATIONS OF THIS STUDY**

This study was subject to the following limitations:

- The scope of this research was limited to perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures only.
- The study population and sample were limited to one organisation (Institution X), therefore confining the research to one organisation. The results of this study could

therefore not be generalised to other similar industries. The findings of this study should therefore be interpreted and implemented within that context.

## **5.6 CONCLUDING REMARKS**

This study evaluated the perceived effect of the internal controls systems on post trade services in financial markets infrastructures. Based on the outcomes research presented in chapter one to four, it can be concluded, specifically at Institution X, that indeed internal controls have an effect on post trade services. All five functions of internal control framework (*Control activities, Risk assessment, Information and communication, Control environment and the Monitoring services*) have an effect on post trade services. It can, therefore, be argued that all the secondary objectives and the primary objectives of this study was achieved.

The findings and recommendations of this study should be of value to the post trade services at Institution X and will, if implemented, improve the internal controls systems on post trade services at Institution X.

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## APPENDIX A: QUESTIONNAIRE

### Questionnaire to Post Trade Services Department

Dear participant

My name is Nelson Kobe. I am a final year MBA student at the North-West University (NWU) - School of Business and Governance.

The objective of this research is to evaluate the perceived effect of the internal controls systems on post trade services in selected financial markets infrastructures.

The questionnaire should take approximately 10 – 15 minutes to complete.

Your participation in this survey is voluntary and all information collected will be kept strictly confidential.

Please answer all questions as accurately as possible and to the best of your knowledge. You may contact me on my mobile at 076 8888 653 or by email on [nkobe4@gmail.com](mailto:nkobe4@gmail.com) should you require further clarity on this study.

Thank you in advance for your assistance in this research project.

Kind regards

**Nelson Kobe**

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## Section A: Demographic Information

Please answer the following questions by marking the relevant selection

**NB: Mark the applicable block with a cross (X). Complete all the questions.**

### 1.1 Gender

Male	Female
1	2

### 1.2 Age

20 and younger	21 – 25	26 – 30	31 – 35	36 – 40	41+
1	2	3	4	5	6

### 1.3 Highest qualification

Grade 12	Diploma	Degree	Honours	Masters	PhD
1	2	3	4	5	6

### 1.4 Employment level

Junior level	Intermediate level	Middle Management	Senior Management	Executive
1	2	3	4	5

### 1.5 Years of experience

Less than 5 years	6 – 10	11 - 15	16 - 20	20 +
1	2	3	4	5

**Section B**

This section has 5 parts namely: Part A, Part B, Part C, Part D and Part E

Questions below are based on COSO internal control framework.

Please provide an answer (X) to each of the following questions according to the scale below:

1	2	3	4
To a small extent	To a moderate extent	To a large extent	To an extreme extent

Part A - Control Activities:					
No	Question	1	2	3	4
1	Post trade services department has sufficient policies and procedures addressing acceptable business practice.				
2	Policy and procedure manuals document all-important key activities performed in the post trade services department.				
3	Policies and procedures of post trade services department are reviewed and updated on a regular basis.				
4	Management reviews the functioning of internal controls system that exist in the post trade services department.				
5	Training on internal controls relating to post trade services department is provided to staff to discharge their responsibilities diligently.				
6	Management closely monitors implementation of internal control systems in the post trade services department.				
7	Appropriate segregation of duties exists in the post trade services department when it comes to internal control system.				
8	Appropriate approvals from management are required prior to allowing transactions in the post trade services department.				

Part B - Risk Assessment:					
No	Question	1	2	3	4
1	Post trade services department identifies risks to the achievement of overall objectives.				
2	Post trade services department involve the appropriate levels of expertise in the company to identify risks to achieving its objectives.				
3	The post trade services department considers risks from external and internal sources in setting goals and objectives for the department.				
4	The post trade services department take necessary action to manage risks identified.				

**Part C - Information and Communication:**

<b>No</b>	<b>Question</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1	The post trade services department internally communicates information necessary to support the functioning of internal control.				
2	The post trade services department communicates with external parties regarding matters affecting the functioning of internal control.				
3	Management is provided with timely, reliable and relevant information on the functioning of internal control for post trade services.				
4	A process is established and communicated to employees about how to communicate suspected instances of wrongdoing regarding the functioning of internal control.				
5	There is training/orientation in place for new employees to discuss the nature and scope of their duties and responsibilities relating to post trade services.				
6	Post trade services department has written job descriptions that describe the duties of personnel, including their internal control responsibilities.				

**Part D - Control Environment:**

<b>No</b>	<b>Question</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1	The post trade services department has a code of conduct.				
2	The code of conduct is distributed to all employees to acknowledge their understanding				
3	The post trade services department has policies addressing conflicts of interest.				
4	Post trade services department employees are required to annually acknowledge that they have read, understood, and complied with the code of conduct.				
5	The level of competence and the requisite knowledge and skills are defined for each job in the post trade services department.				
6	Job descriptions are in place for all employees in the post trade services department.				

**Part E - Monitoring Activities:**

No	Question	1	2	3	4
1	Post trade services department has a suitable monitoring processes in place to assess whether controls across the internal control systems are functioning as intended.				
2	The post trade services department relies on exception reports to monitor effectiveness of internal controls system				
3	The post trade services department relies on the internal audit department for monitoring of internal controls system.				
4	The post trade services department relies on customer feedback to identify internal control weaknesses.				
5	Post trade services department has process in place used to monitor when internal controls are overridden.				
6	Post trade services department has a process in place to track unremediated control weaknesses.				

**General remarks**

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***Thank you very much for your time and effort to fill the questionnaire.***

## APPENDIX B: LANGUAGE EDITOR'S LETTER



Antoinette Bisschoff  
71 Esselen Street,  
Potchefstroom  
Tel: 018 293 3046  
Cell: 082 878 5183  
[Language@dits.co.za](mailto:Language@dits.co.za)  
CC No: 1995/017794/23

Friday, 04 September 2020

To whom it may concern

**Re: Confirmation of language edit, typography and technical precision**

The MBA dissertation by **Nelson Kobe (29807697)**, “**The evaluation of the perceived effect of internal control systems on post trade services in selected financial markets infrastructures**” was edited for language, typography and technical precision. The referencing and sources were checked and comply to the Harvard guidelines specified by the 2020 NWU Reference guide.

Final, last minute corrections remain the responsibility of the author.



**Antoinette Bisschoff**

**BA Languages (UPE – now NMU); MBA (PU for CHE – now NWU); Translation and Linguistic Studies (NWU)**

Officially approved language editor of the NWU since 1998  
Member of SA Translators Institute (no. 100181)