Exploring Information Systems Success and Organisational Big Data Analytics Capabilities in International Financial Reporting Standard 9 Adoption

CONNOR CHARLES STEAD

A thesis submitted in partial fulfilment of the requirements for the Master of Research

Department of Accounting and Corporate Governance
Faculty of Business and Economics
Macquarie University
Sydney, Australia

October 2017

Table of Contents

List of Tables

List of Figures

List of Equations

Abstract

International Financial Reporting Standard (IFRS) 9 becomes mandatory in January 2018, replacing International Accounting Standard (IAS) 39. The standard introduces a revolutionary forward-looking credit loss model requiring affected entities to calculate and report expected credit losses associated with financial instruments. The new expected credit loss model necessitates entities to use a range of data assets and big data analytical approaches which have not previously been employed for IFRS reporting. Industry analysis has identified the new standard as a practical challenge which impacts data governance frameworks and information systems infrastructures. Extant IFRS, data governance and big data literature does not address the impact of IFRS standard evolution on the data governance frameworks and big data information system infrastructures of affected entities. Moreover, extant literature does not explore the influence of an entity's capability to conduct big data analytics on their ability to comply with new standard requirements. To address these literature gaps, this study extended DeLone and McLean's information systems success model with the concepts of organisational big data analytics capabilities and attitudes towards IFRS 9 compliance. The model was then tested by surveying industry professionals involved with international IFRS 9 implementation projects. To evaluate the research model, the results of the survey were analysed using structural equational modelling partial least squares. The primary finding of this study is that the capability of an entity to conduct big data analytics positively affects their employee's intentions to use IFRS 9 analytics applications and their attitude towards the ability of their entity to comply with IFRS 9. Another key finding is that the quality of the output of information systems used to support IFRS 9 analytics applications positively impacts the intention of affected entity's employees to use IFRS 9 analytics applications and their attitude towards the ability of the entity to comply with the standard. This study is the first to test an information systems success model in the context of IFRS 9 and is the first to introduce the concept of organisational big data analytics capabilities as an independent variable in information systems success. The study is also relevant to entities which are required to comply with IFRS as it provides empirical research which may help them to develop readiness and capabilities for future IFRS standards.

Statement of Originality

I hereby certify that this work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

_____

Connor Charles Stead

Acknowledgements

First and foremost, I would like to acknowledge the love and support of my beautiful wife, Ma Loisa Anne Ortiola Stead. I could not have completed this body of work without her by my side and I sincerely thank her for always motivating me to chase my dreams. You always give me strength and continue to be my greatest motivation in life. Mahal na mahal kita!

I must also thank my supervisor and mentor Dr Savanid Vatanasakdakul. I would not be in the position I am today without her guidance and advice. Dr Vatanasakdakul is an outstanding teacher and academic. The lessons I have learnt from her will stay with me forever and have already positively shaped my future. I sincerely thank you everything Dr Vatanasakdakul.

I also could not have completed this project without the support of my associate supervisors, Dr Michael Quilter and Dr Mauricio Marrone. Thank you for helping me throughout this year and for assisting me to succeed in all aspects of the Master of Research journey. I also wish to acknowledge the contribution of Dr Elaine Evans, Dr Vicki Baard, Dr Chris Patel, Dr John Dumay, Lin Bai and Sean Bullock from Macquarie University.

Thank you to the academics and researchers in attendance at the 21st Pacific Asia Conference on Information Systems who provided critique, advice and guidance for this thesis. I particularly thank the conference reviewers who provided me with immeasurable feedback.

To my loving family, Mum, Dad, McKenna, Kendall and Nanny. Thank you for always supporting me and ensuring that I succeed. You are all so important to me and I am very appreciative for the opportunities you have provided. I love you all so dearly. I also acknowledge my friends, particularly Seb, Nick, James, Tristan, Connor, Harrison, Brodie, Rob, Lachie and Mark. Thank you for encouraging me to be a better person. I look forward to spending more time with my family and friends now that this thesis is complete.

Finally, I wish to acknowledge Macquarie University and the Australian Government for affording me the Research Training Pathway scholarship. I feel very fortunate and honoured to be granted the opportunity to study within the Australian higher education system and I look forward to repaying my debt by continuing to research and seeking to contribute to the body of knowledge.

Thank you everyone for making this thesis possible.

Chapter 1: Introduction

1.1 Background of the Study

The effect of the 2007 global financial crisis (GFC) was devastating. Property owners were forced out of homes and employees into unemployment. Large multinational financial institutions closed their doors, global trade declined (Matheson, 2013) and in 2008 private pensions asset values in OECD nations declined by USD$4 trillion (Tower and Impavido, 2009). The crisis impacted the economic growth of developing countries (Dolphin and Chappell, 2010) and the World Bank Group (2009) suggested that it led to a 50 to 90 million person increase in the number of individuals living under USD$1.25 a day. Atkinson, Luttrell, and Rosenblum (2013) estimated that the financial cost of the GFC ranged between USD$6 trillion to USD$14 trillion. Using a different approach, Better Markets Inc. (2012) estimated the cost of the crisis at USD$12.8 trillion.

International accounting standard setters, such as the International Accounting Standards Board (IASB), were criticised after the GFC for their standard's failure to provide transparency for financial markets. The Financial Stability Forum (2008) in their report on enhancing market and institutional resilience identified financial disclosure issues which contributed to the crisis. Such issues included the failure of public financial disclosure by entities to "always make clear the type and magnitude of risks associated with their on- and off-balance sheet exposures" (p. 8). They recommended that the IASB, the body responsible for the development and publication of International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS), "improve the accounting and disclosure standards for off-balance sheet vehicles" (Financial Stability Forum, 2008, p. 25) and work towards ensuring that risk exposures and potential losses be documented in financial disclosure (p. 25). In 2009 G20 leaders called on the IASB to improve standards on valuation and provisioning (G20, 2009).

The incurred credit loss approach in IAS 39 was particularly criticised due to its tight restrictions on loan loss recognition which led to an overstatement of financial instrument values (Camfferman, 2015). Institutions may have been in the position to foresee increases in credit risk and an onset of expected credit losses affecting their portfolios of exotic financial instruments, such as credit default swaps and collateralised debt obligations, in the events leading up to the GFC. At the time, entities mandated to prepare financial statements in compliance with IASB standards were required under IAS 39 to disclose to financial markets credit losses *incurred* on financial instrument portfolios. In other words, entities who may have been able to anticipate credit losses associated with their financial instrument portfolios were only required by the financial accounting standards in effect to communicate credit losses which *had already been incurred*, not the losses *they expected to incur.*

In response to the criticism regarding the characteristics of IAS 39, particularly its incurred credit loss model (Camfferman, 2015), the IASB set about developing a new financial reporting standard addressing

the accounting of financial instruments. In July 2014, the IASB announced IFRS 9, a standard which they referred to as their "main response to the global financial crisis" (IFRS Foundation, 2014). The objective of the standard is to provide users of financial statements relevant and useful information about an entity's future cash flows (International Accounting Standards Board, 2014, para 1.1). On January 1, 2018, IFRS 9 becomes mandatory, replacing IAS 39 for most entities (International Accounting Standards Board, 2014) with those whose operations are predominately connected with insurance activities granted a temporary compliance extension until January 1, 2021 (Ernst and Young, 2015; KPMG, 2016).

The key change introduced by the standard is the movement away from the incurred credit loss model of IAS 39 to an expected credit loss model. The primary distinction between the two models relates to the recognition of credit losses. Under IAS 39, credit losses are not recognised until an adverse credit loss event occurs (Ernst and Young, 2014). As there is no apparent frequency of which credit losses are incurred over the lifetime of financial instruments this approach can lead to "a mismatch in the timing of the recognition of the credit spread inherent in the interest charged" (EY, IFRS 9 4). In contrast, IFRS 9 does not require an adverse credit event to occur before credit losses are to be recognised (International Accounting Standards Board, 2014) and under the standard's expected credit loss model entities are required to categorise their financial instruments into three stages.

Each stage varies with respect to the amount of time and method in which entities are required to predict expected credit losses that may incur over a financial instrument's lifetime (International Accounting Standards Board, 2014). This time period can range from 12 months for stage 1 instruments to the entire duration of the financial instrument's lifetime for stage 3 instruments. Migration from stage to stage requires the determination that a "significant increase in credit risk" (International Accounting Standards Board, 2014, para. B5.5.7) has occurred. This determination can be made using a vast array of information, ranging from a "significant change in the financial instrument's external credit rating" (International Accounting Standards Board, 2014, para. B5.5.17) to "expected changes in the loan documentation including an expected breach of contract" (International Accounting Standards Board, 2014, para. B5.5.17).

Ernst and Young (2017) expect the standard to have a major impact on the information technology (IT) infrastructures of affected entities, asserting that "IFRS 9 represents a large-scale transformational change for financial institutions" (p. 18). The professional services firm also suggests that to successfully implement the requirements of IFRS, IT systems of affected entities must be capable of conducting complex calculations "performed leveraging large volumes of new data" (p. 18). In another industry survey, Moody's Analytics (2016) found that a key challenge for financial institutions affected by the standard was the accessibility to historical data for some financial instrument portfolios. Moody's

Analytics (2016) also identified IT infrastructure issues associated with the ability of affected entities to handle large volumes of analytical calculations (p. 28).

Chartis Research (2016) produced a report on the standard and the impact it is expected to have on affected entities, particularly through an IT perspective. The research firm suggests that the standard is a "large transformational event for all financial institutions, regardless of their size and complexity" (p. 7). They propose an IT architecture diagram which they recommend affected entities implement to manage the requirements of the standard. This architecture diagram features the incorporation of data warehouses, analytic engines, data marts, online analytical processing cubes as well as data mining and analytics applications. Moody's Analytics (2017) also propose a big data architecture diagram which highlights the pivotal role big data capabilities and governance will play in enabling affected entities to comply with the requirements of IFRS 9.

Another problem which confronts industry relates to the shortcomings of academia in examining the data governance and big data related aspects of the IFRS 9 phenomenon. It has become apparent that extant literature has not yet explored the impact of changes or evolutions in IFRS standard setting on the big data information systems infrastructures and the data governance frameworks of affected entities. Moreover, extant literature has also not yet explored how the capability of entities to conduct big data analytics impacts their ability to comply with changes introduced in new IFRS standards. These literature gaps impact practice as industry actors are not yet able to turn to and reflect upon empirical academic literature to learn how to best address the challenges they face. This is also problematic for academia as the body of knowledge does not address a real-world phenomenon that is forcing society's business entities to invest resources in confronting. This study will seek to contribute to the financial accounting and information systems body of knowledge and in turn assist industry by conducting empirical research on the data governance and big data analytics capabilities related success factors and challenges associated with implementation of IFRS 9.

To contribute in such a manner, this study must address the aforementioned gaps in extant literature. In doing so, information systems success theory will be adopted. Information systems success is one of the most prominent streams of IS research (Urbach and Muller, 2012) with a majority of studies in the field implementing or examining DeLone and McLean's (1992, 2003) information systems success models. The updated version of their model (DeLone and McLean, 2003) features six dimensions: system quality, information quality, service quality, intention to use/use, user satisfaction and net benefits. In the model the system, information and service qualities used to describe information systems affect the intention to use or actual use of such systems, as well as the satisfaction of its users. The intended or actual use and the satisfaction of users then affects the net benefits which may be derived through the system's use. These benefits in turn affect the intention to use or actual use of the system and user's satisfaction.

DeLone and McLean's (2003) information systems success model has been "found to be a useful framework for organizing IS success measurements" (Petter, DeLone, and McLean, 2008, p. 238) and has been extensively used in information systems literature to analyse the dimensions of information systems success (Petter et al., 2008). The adoption of the model in this study will facilitate the investigation of the system, information and service qualities of information systems intended to be used by the affected entities to support analytics applications which will enable compliance particularly with the expected credit loss modelling component of IFRS 9. The adoption of this model will also support an examination of the relationship between intended use of the IFRS 9 analytics applications and the realisation of benefits for the affected entities derived from such intended use.

Industry analysis (Ernst and Young, 2017; Chartis Research, 2016; Moody's Analytics, 2016, 2017; Global Public Policy Committee, 2016; European Banking Authority, 2016) has suggested that entities affected by IFRS 9 will need to be capable of handling large volumes of analytic calculations on new data sets in order to comply particularly with the standard. This suggestion warrants the inclusion of the concept of big data into the analysis on what success factors are associated with implementation of IFRS 9 requirements into affected entities. Big data is "a term commonly associated with massive data sets growing at a rapid pace, [which] also represents complexity and variety in the types of data that are being collected and analyzed" (Malik, 2013, p. 1).

The capability to analyse big data is described by Fosso, Gunasekaran, Akter, Ren, Dubey, and Childe (2017) as an approach to processing and analysing the 5 'V' dimensions of big data to "create actionable ideas for delivering sustained value, measuring performance and establishing competitive advantages" (p. 356). These 5 'V' dimensions refer to volume, variety, velocity, veracity and value data characteristics (Fosso, Akter, Edwards, Chopin, and Gnanzou, 2015). Volume refers to the quantity of data stored; variety relates to the array of different data types and velocity relates to the speed at which data is processed (Meijer, 2012). Veracity reflects the inherent unreliability of some data sources (Gandomi and Haider, 2015) and value refers to the ability of the data to provide economic insights and or benefits for an organisation (Fosso et al., 2015).

DeLone and McLean's (2003) information systems success model does not reflect the organisational capability to conduct big data analytics as an independent variable influencing the intention to use an information system. Consequently, this study will adopt the concept of big data analytics capabilities from the research models of Akter, Fosso, Gunasekaran, Dubey, and Childe (2016) and Fosso et al. (2017) and introduce it as an independent variable in DeLone and McLean's (2003) information systems success model. The intention behind this is to examine what effect an entity's capability to perform big data analytics has on the intended use of IFRS 9 analytics applications and perceived attitudes towards compliance. In their research, both Akter et al. (2016) and Fosso et al. (2017) examined the effect of big data analytics capabilities on firm performance. Due to the emphasis on the need to leverage big data

analytics in industry analysis on IFRS 9 as well as DeLone and Mclean's (2003) call to ensure that the adoption of their information systems success model aligns with the context of the study, the adoption of the big data analytics concept as an independent variable is defensible.

Furthermore, the concept attitudes towards compliance will also be introduced to extend the information systems success model enabling it to address the context of IFRS 9 adoption. This concept is motivated by extant standard compliance research (Birindeli and Ferretti, 2008; Alexander, Bauguess, Bernile, Lee, and Marietta-West, 2013; Jermakowicz and Gornik-Tomaszewski, 2006) and seeks to measure the extent to which industry professionals perceive their entity can comply with the requirements of IFRS 9. The introduction of this concept into DeLone and McLean's (2003) information systems success model enables this study to explore what affect organisational capability to conduct big data analytics as well as the system, information and service qualities of entity's information systems have on the perception that IFRS 9 will be complied with by an affected entity. Moreover, this concept's inclusion will permit the study to explore the effect of perceived compliance on the perceived extent to which IFRS 9 applications are contributing to the success of varying stakeholders within the affected entity measured using DeLone and McLean's (2003) net benefits dimension.

1.2 Research Motivation

Extant IFRS literature primarily addresses the concept of harmonisation (Chand and Patel, 2008; Ramanna, 2013; Peng and Bewley, 2010), which refers to the quest to unify financial accounting standards across jurisdictions. Studies in this domain have also examined the impact of IFRS adoption on accounting quality (Soderstrom and Sun, 2007) and the economic consequences of IFRS adoption (Daske, Hail, Leuz, and Verdi, 2008). Studies conducted in the big data field include those that discuss the characteristics of the concept (Malik, 2013; Gandomi and Haider, 2015), how organisations should leverage its potential (Huwe, 2012) and its ability to transform business strategies (Davenport, Barth, and Bean, 2012). Studies have also explored the concept of big data analytics capabilities and how the ability of organisations to conduct analytics within the big data sphere impact upon their ability to perform (Fosso et al., 2015; Akter et al., 2016; Fosso et al., 2017). Data governance literature tends to explore the relationship of the concept with corporate governance and IT governance (Weill and Ross, 2004; Wende, 2007). Literature has also developed a data governance framework to assist in the stewardship, governance and decision-making over the use of data assets (Khatri and Brown, 2010).

One aspect which extant literature from the research bodies of IFRS, big data and data governance has not explored is the relationship between the evolution of IFRS standards and the data governance frameworks and big data information system infrastructures of affected entities. Moreover, extant literature does not explore if entities affected by evolutions in IFRS can leverage their capabilities to perform big data analytics to comply with new standard requirements. This study is primarily motivated

to address these apparent literature gaps by conducting empirical research intended to identify success factors and challenges associated with the implementation of IFRS 9 requirements into the information systems infrastructures of affected entities. This research is relevant due to the current IFRS 9 phenomenon affecting international entities and particularly their inability to turn to the extant body of academic knowledge for guidance on how to navigate the pertinent challenges they face.

Furthermore, this study is also motivated by DeLone and McLean's (2003) call to test and validate their information systems success model in new contexts. Contributing to DeLone and McLean's (2003) information systems success model and therefore information systems success literature is another motivation and is hoped to be achieved by introducing Akter et al. (2016) and Fosso et al.'s (2017) big data analytics capabilities concept as an independent variable. As firms begin to adopt big data analytics capabilities and leverage it to enable competitive advantages and improve firm performance (Akter et al., 2016; Fosso et al., 2017), it would be beneficial to the body of knowledge to understand how this influences the intention to use information systems, particularly those reliant on the ability to handle large volumes of analytical calculations such as required by the expected credit loss model of IFRS 9.

Another motivation for this study is to confirm the validity and reliability of using hierarchical component models for the measurement of DeLone and McLean's (2003) system, information and quality dimensions and both Akter et al. (2016) and Fosso et al.'s (2017) big data analytics capabilities concept. Hair, Hult, Ringle, and Sarstedt (2014) recommend the use of hierarchical component models to measure abstract and complex dimensions. In extant information systems literature the system, information and service quality dimensions have been measured in hierarchical component models (Nelson, Todd, and Wixom 2005; Gable, Sedera, and Chan, 2008; Hamilton and Chervany, 1981; Bailey and Pearson, 1983; Iivari, 2005; Sedera and Gable, 2004; Rainer and Watson, 1995; McKinney, Yoon, and Zahedi, 2002; Parasuraman, Berry, and Zeithaml, 1991; Gorla, Somers, and Wong, 2010). Additionally, Akter et al. (2016) and Fosso et al. (2017) use first and second order constructs to measure the concept of big data analytics capability.

Above all else, this research endeavour is motivated by the desire to contribute to society through the exploration of the implementation of IFRS 9 into the information systems architectures of affected entities. IFRS 9 is a major component of the financial accounting practice's response to their standards role in the GFC. For it to be successful in addressing the shortcomings of its predecessor, affected entities must be successful in implementing its requirements. It is hoped that the identification of success factors associated with the standard's implementation will enable entities to manage their implementation initiatives with greater efficiencies, reducing the impact on their operations and minimising financial costs which may be passed onto their customers and shareholders. Ultimately, the findings of this endeavour may help to streamline the implementation of not only IFRS 9, but also future standards which share similar characteristics.

1.3 Research Questions, Aims and Objectives

The overall aim of this research endeavour is to explore the effect of IFRS standard evolution, in this context represented by the introduction of IFRS 9, on the data governance frameworks of affected entities and how big data analytics capabilities affect compliance attitudes. To achieve this aim, this study will seek to answer six research questions which are derived from the motivations identified in the previous section. The first research question explores the relationship between DeLone and McLean's (2003) three independent information systems success dimensions and the concept of organisational big data analytics capabilities on the intention to use IFRS 9 analytics applications and attitudes towards compliance with the standard. The second research question explores the relationship between intended use of IFRS 9 analytics applications and attitudes towards compliance on the benefits affected entities realise as a result of the IFRS 9 analytics applications intended use. Research questions 3, 4, 5 and 6 seek to explore whether the independent dimensions in this study's research model are multidimensional and can be examined using structured equational modelling hierarchical component models.

Research Question 1: Do organisational big data analytics capabilities, system quality, information quality and service quality influence the intention to use IFRS 9 analytics applications and attitudes towards IFRS9 compliance?

The purpose of the first research question is to examine the influence of affected entity's organisational big data analytics capabilities as well as the system, information and service qualities of their information systems on industry professional's intention to use IFRS 9 analytics applications and attitudes towards their entity's ability to comply with IFRS 9 requirements.

Research Question 2: Does intention to use IFRS 9 analytics applications and attitude towards IFRS 9 compliance influence perceived benefits of IFRS 9 applications?

Exploration of the second research question will help to determine whether the intention to use IFRS 9 analytics applications and if attitudes towards the ability to comply with the standard positively affect the perceived extent to which varying stakeholders within the entity are realising benefits.

Research Question 3: What constitutes valid and reliable scales for measuring organisational big data analytics capabilities?

Research Question 4: What constitutes valid and reliable scales for measuring system quality?

Research Question 5: What constitutes valid and reliable scales for measuring information quality?

Research Question 6: What constitutes valid and reliable scales for measuring service quality?

The purpose of research questions 3, 4, 5 and 6 is to examine if hierarchical component models are valid and reliable methods to measure the abstract dimensions of organisational big data analytics as well as

system, information and service quality dimensions. Additionally, the questions seek to determine what first-order constructs can be used to measure the dimensions in a valid and reliable manner.

1.4 Thesis Structure

The remainder of this study is structured as follows.

Chapter Two: Literature Review

Chapter two will present the academic literature and industry analysis relevant to the research problem at hand. The theoretical framework of the study will be presented and the chapter will conclude with a development of the hypotheses.

Chapter Three: Research Methodology

Chapter three will introduce the methodology to be leveraged by the study to test the hypotheses. The chapter will include a discussion of the unit of analysis, survey questionnaire methodology utilised as well as the statistical data analysis method.

Chapter Four: Results

The fourth chapter will outline the steps taken to analyse the study's results. It will discuss the descriptive statistical results as well as those from the measurement and structural model structural equational modelling partial least square analysis.

Chapter Five: Discussion

Chapter five will provide a detailed breakdown and analysis of the study's research questions and hypotheses identifying implications for the body of knowledge and practice throughout. The chapter will conclude with a summary of the study's findings.

Chapter Six: Conclusion

The final chapter will provide an overview of the study. The theoretical and practical contributions will be discussed along with an outline of the study's limitations and recommendations for future research.

Chapter 2: Literature Review

2.1 Introduction

This chapter will examine literature from the research fields of IFRS, data governance and big data as well as industry analysis on the challenges associated with IFRS 9 implementation. Information systems success and the concepts of big data analytics capabilities and attitudes towards compliance will be introduced followed by a development of the hypotheses.

2.2 A New Standard in International Financial Accounting

This section will introduce IFRS and IFRS 9. Recent industry analysis on the challenges posed by the new standard will also be discussed which will help to portray a sense of the research problem at hand.

2.2.1 International Financial Reporting Standards

IFRS are global standards intended to facilitate the comparability of financial statements across international jurisdictions (Pacter, 2016). International convergence of financial reporting standards is the single most significant trend in international accounting practice (PricewaterhouseCoopers LLC, 2012). As of 2016, 119 jurisdictions require financial statements to be prepared using IFRS in all or most domestic publicly accountable entities (Pacter, 2016).

IFRS refers to the body of authoritative literature produced by the IASB (KPMG IFRG Limited, 2006). The fundamental assumption of IFRS is that an "entity is a going concern and will continue in operation for the foreseeable future" (International Accounting Standards Board, 2010, para. 4.2). KPMG IFRG Limited. (2006) indicates that "any entity claiming that a set of financial statements is in compliance with IFRS must comply with all such standards and related interpretations" (p. 5).

2.2.2 International Financial Reporting Standard 9

IFRS 9 is a new IFRS standard that addresses the accounting for financial instruments, which are defined as "any contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity" (International Accounting Standards Board, 2005, para. 11). The International Monetary Fund (2009) classifies financial instruments into three categories: equity and investment fund shares, debt instruments and other financial assets and liabilities. On January 1, 2018, IFRS 9 becomes mandatory, replacing IAS 39 for most entities (International Accounting Standards Board, 2014) with those whose operations are predominately connected with insurance activities granted a temporary compliance extension until January 1, 2021 (Ernst and Young, 2015; KPMG, 2016). IFRS 9, first introduced by the IASB in July 2014, introduces a new forward-looking credit loss model, changes to the classification of financial instruments and the formation of new hedge accounting requirements.

The objective of IFRS 9 is:

> "… to establish principles for the financial reporting of financial assets and financial liabilities that will present relevant and useful information to users of financial statements for their assessment of the amounts, timing and uncertainty of an entity's future cash flows" (International Accounting Standards Board, 2014, para 1.1).

One of the fundamental components of IFRS 9 is the introduction of an expected credit loss model. Unlike the incurred loss model employed by its predecessor, IAS 39, the IFRS 9 expected credit loss model does not require a credit event to occur for credit losses to be recognised (International Accounting Standards Board, 2014). The IFRS 9 expected credit loss model features a three-stage approach for the measurement of financial instrument impairment (BDO IFR Advisory Limited, 2014). These stages determine "the amount of impairment to be recognised (as well as the amount of interest revenue)" (BDO IFR Advisory Limited, 2014, p. 9). Migration from stage to stage requires the determination that a "significant increase in credit risk" (International Accounting Standards Board, 2014, para. B5.5.7) has occurred or that the instrument has been impaired.

At initial recognition of a financial instrument, entities are required to recognise 12-month expected credit losses calculated using the gross carrying amount (PwC, 2017). PwC (2017) define this as "the expected credit losses that result from default events that are possible within 12 months after the reporting date" (p. 2). Upon migration to stage two of the model entities are required to recognise expected credit losses associated with the lifetime of the financial instrument, also calculated at the gross carrying amount (PwC, 2017). Expected losses over the lifetime of the financial instrument can occur "from all possible default events over the expected life of the financial instrument" (PwC, 2017, p. 3). The third stage in the model is reserved for financial instruments which "have objective evidence of impairment at the reporting date" (PwC, 2017, p. 3). Like stage two, financial instruments classified in the third stage require expected credit losses to be calculated for the lifetime of the financial instrument, however losses are to be calculated using the net carrying amount (PwC, 2017). Figure 1 provides a graphical representation of the IFRS 9 expected credit loss model.

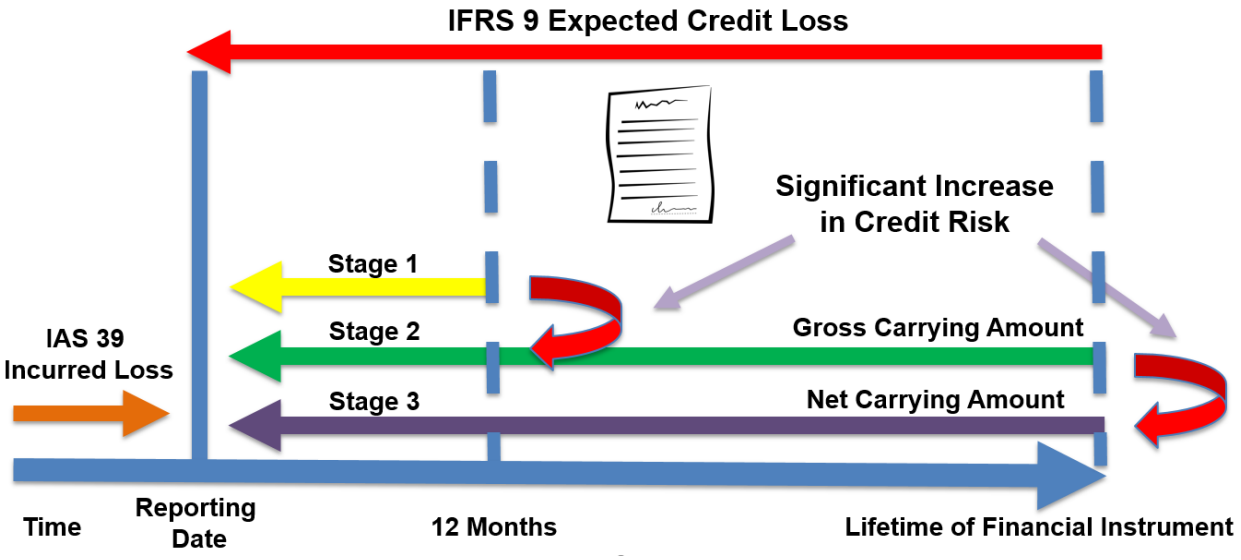


Figure 1: Graphical Representation of the IFRS 9 Expected Credit Loss Model

IFRS 9 provides a non-exhaustive list of information which may assist in the calculation of credit risk changes. Limited examples of the information sources detailed in the standard include a "significant change in the financial instrument's external credit rating" (International Accounting Standards Board, 2014, para. B5.5.17); "existing or forecast adverse changes in business, financial or economic conditions that are expected to cause a significant change in the borrower's ability to meet its debt obligations" (International Accounting Standards Board, 2014, para. B5.5.17) and "declining revenues or margins, increasing operating risks, working capital deficiencies, decreasing asset quality, increased balance sheet leverage, liquidity, management problems or changes in the scope of the business or organisational structure" (International Accounting Standards Board, 2014, para. B5.5.17).

The requirement to leverage such a broad range of internal and external data assets specifically for IFRS 9 expected credit loss modelling is a major challenge for international entities affected by the standard. Professional services firms, regulatory bodies and vendors supplying information systems solutions to help entities implement the requirements of the standard have conducted analysis on its associated challenges and impacts on operations. The proceeding section will examine extant industry analysis on the matter which will portray a sense of the practical problem brought on by IFRS 9.

2.2.3 IFRS 9 Implementation Challenges and Practical Problems

This section will examine the practical problems associated with IFRS 9 implementation through an examination of industry analysis.

In 2014 Deloitte surveyed 54 international financial institutions to explore IFRS 9 related challenges. In response to the question "from a governance perspective, what are your biggest concerns about using credit risk management systems and data for financial reporting purpose?" (Deloitte, 2014, p. 8), 56% of respondents indicated that "reconciling financial reporting and credit data" (Deloitte, 2014, p. 8) would

be their greatest concern, closely followed by data quality with 34% of respondents. In 2015 Deloitte asked the question in another survey. In this survey, 40% of respondents indicated that "reconciling financial reporting and credit data" (Deloitte, 2015, p. 15) was the greatest challenge while 38% opted for data quality. Deloitte asked the same question in a 2016 survey. The most recent results indicated that 34% of respondents regard "reconciling financial reporting and credit data" (Deloitte, 2016, p. 51) as the greatest challenge with 43% identifying the quality of their data assets. Figure 2 summarises the findings of the three Deloitte (2014, 2015, 2016) surveys, highlighting the increasing concern with regard to data quality and the quality of the audit trail and governance of data assets over the three years.

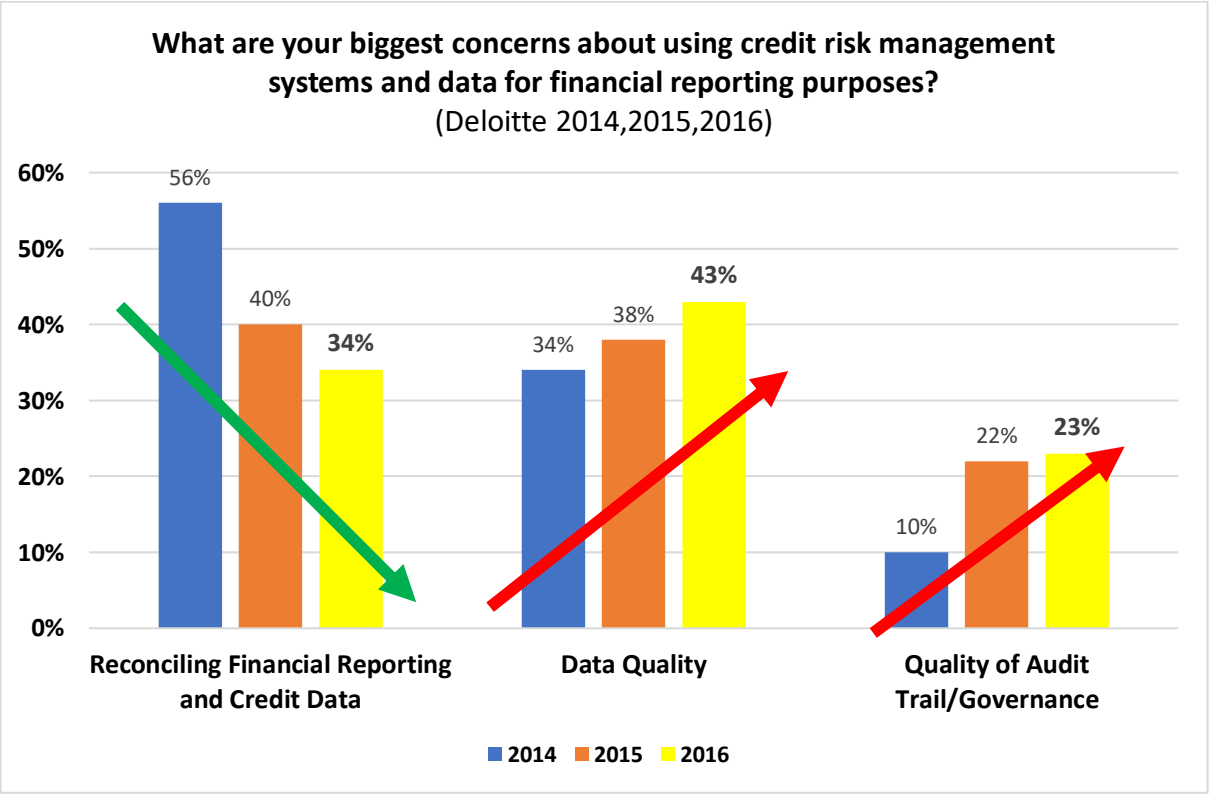


Figure 2: Summary of Deloitte (2014, 2015, 2016) IFRS 9 Surveys

In 2016, Ernst and Young (2016) surveyed 36 international financial institutions regarding the implementation of IFRS 9. In their analysis of IT and governance aspects, Ernst and Young (2016) found that "most banks have identified data gaps early on in their programs" (p. 15). These gaps "include not only data limitations but also data reconciliation issues (i.e. data mismatch)" (Ernst and Young, 2016, p. 15). Ernst and Young (2017) conducted a follow-up survey in 2017. In their findings, Ernst and Young (2017) stated that "IFRS 9 represents a large-scale transformational change for financial institutions" (p. 18) and that their IT systems will need to facilitate complex calculations "performed leveraging large volumes of new data" (p. 18).

Moody's Analytics (2016) conducted an IFRS 9 survey in 2015 on 25 banking institutions in North America and Europe. They determined that "banks were largely unprepared for IFRS 9 at the time of the survey" (Moody's Analytics, 2016, p. 28). Regarding data required for expected credit loss analysis, Moody's

Analytics (2016) found that “the most critical challenge for many banks was the lack of historical data for some portfolios” (p. 30). The survey also found that data required for IFRS 9 probability of default calculations was an issue as it had not been previously stored by the institutions (p. 30). Information systems infrastructure concerns were also noted, including “issues related to handling larger volume of calculations” (Moody’s Analytics, 2016, p. 28) and data quality.

The Global Public Policy Committee (2016) state that IFRS 9 ECL models are “dependant on a wide range of data which may not be immediately available, including forward-looking estimates of key macro and microeconomic factors” (p. 9). The committee also found that some data assets “may not currently be subject to the same rigorous governance and controls normally associated with information used for financial reporting” (Global Public Policy Committee, 2016, p. 9). To address this problem, they suggest that “appropriate governance and controls will be required for these sizeable additional data sets used for the estimation of ECL” (p. 9).

The impact of IFRS 9 on affected entities has also been explored by the European Banking Authority (2016). Their findings suggested that “data quality and availability are the most significant challenges for banks” (European Banking Authority, 2016, p. 5). The European Banking Authority (2016) also determined that “risk and finance are involved in the implementation of IFRS for most banks” (p. 15) and that “the IT function is also significantly involved” (p. 15). The European Banking Authority (2017) conducted a follow-up survey a year later. In this analysis they identified additional issues such as the “difficulty of finding personnel with the appropriate skills (e.g. modelling or IT skills)” (p. 24). Furthermore, respondents in this second survey frequently mentioned data quality, availability and integration challenges (European Banking Authority, 2017, p. 24).

Chartis Research (2016) published a report on the technology solutions available to support entities affected by IFRS 9. The report identifies eleven vendors who provide IFRS 9 technology solutions, including AxiomSL; Fernbach, FIS, Misys, Moody’s Analytics, Oracle, Prometeia, Quantifi, SAP, SAS and Wolters Kluwer FS. In their report, Chartis Research (2016) proposed an IT infrastructure diagram for successful IFRS 9 implementation, illustrated in Figure 3. This diagram shows data mining, analysis, scorecards, metrics, early warning systems, reporting and dashboards as applications through which entities will analyse credit risk and other IFRS 9 related data. These applications rely on data marts; online analytical processing (OLAP) cubes, analytic engines, data warehouses and operational data storage which acquire data from credit cards, auto loans, treasury and core banking operational databases.

Alongside data acquisition, storage and analysis, Chartis Research (2016) demonstrate in Figure 3 that governance plays a pivotal role in the IT infrastructure for IFRS 9 activities. Operational risk, policy, compliance, financial controls, IT governance and internal audit processes are all undertaken when data is pulled from banking operations (Chartis Research, 2016). The infrastructure diagram also identifies data

which the applications will incorporate through scenario and stress testing. These include market risk, credit risk, liquidity risk and risk-adjusted return on capital (RAROC) data assets.

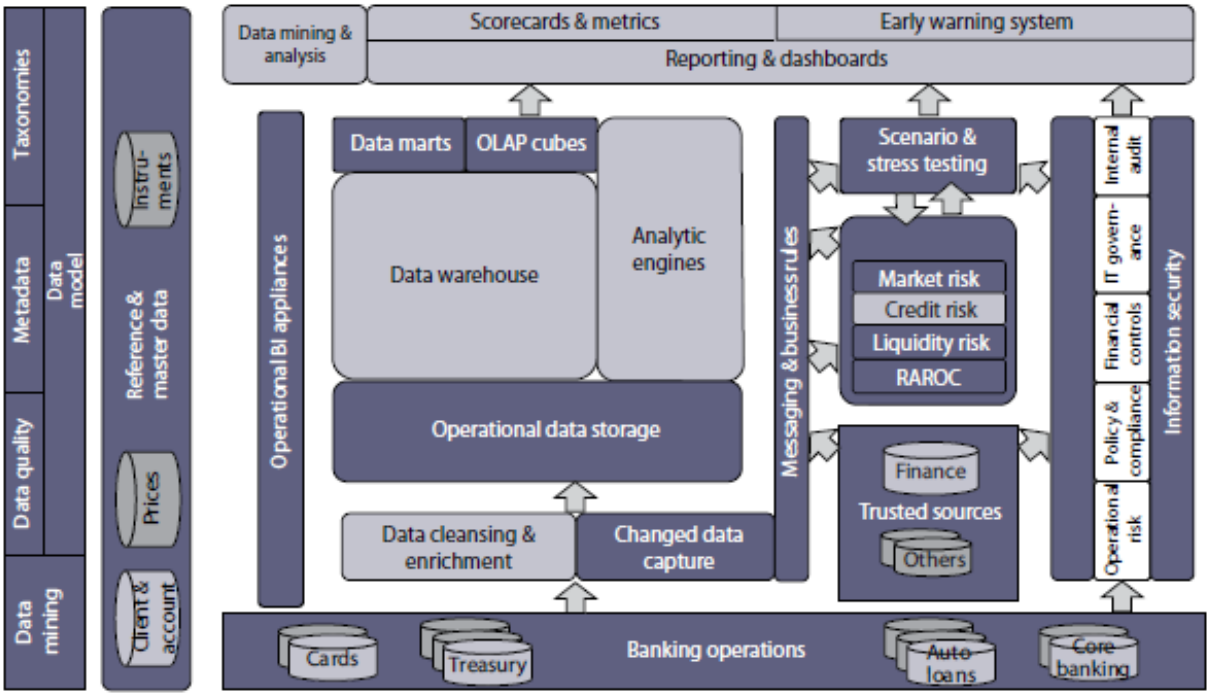


Figure 3: Chartis Research (2016, p. 29) IFRS 9 Affected IT Infrastructure Diagram

Figure 4 outlines a big data information systems architecture which Moody's Analytics (2017) recommends affected entities implement to comply with IFRS 9. This diagram highlights the massive quantity of data which affected entities need to manage. It also addresses data governance and security aspects, such as the ingestion and preparation of source data from both internal and external sources. Moody's Analytics (2017) identifies asset liability management, IFRS 9 compliance and stress testing as business processes which rely on the acquired data assets. Statistical programming languages such as Scala, Python, Java, C++ and R are acknowledged in the diagram as enabling risk, behavioural and stress scenario model management. Reporting, adjustments and audit applications are shown at the end of the business process workflow and are similar to those identified in the Chartis Research (2016) infrastructure diagram. Moody's Analytics (2017) recommends that these data governance aspects and business process workflow components operate on top of an Apache Spark engine for large-scale data processing (The Apache Software Foundation, 2017a) utilising Apache Hadoop, a highly fault-tolerant distributed file system (The Apache Software Foundation, 2017b).

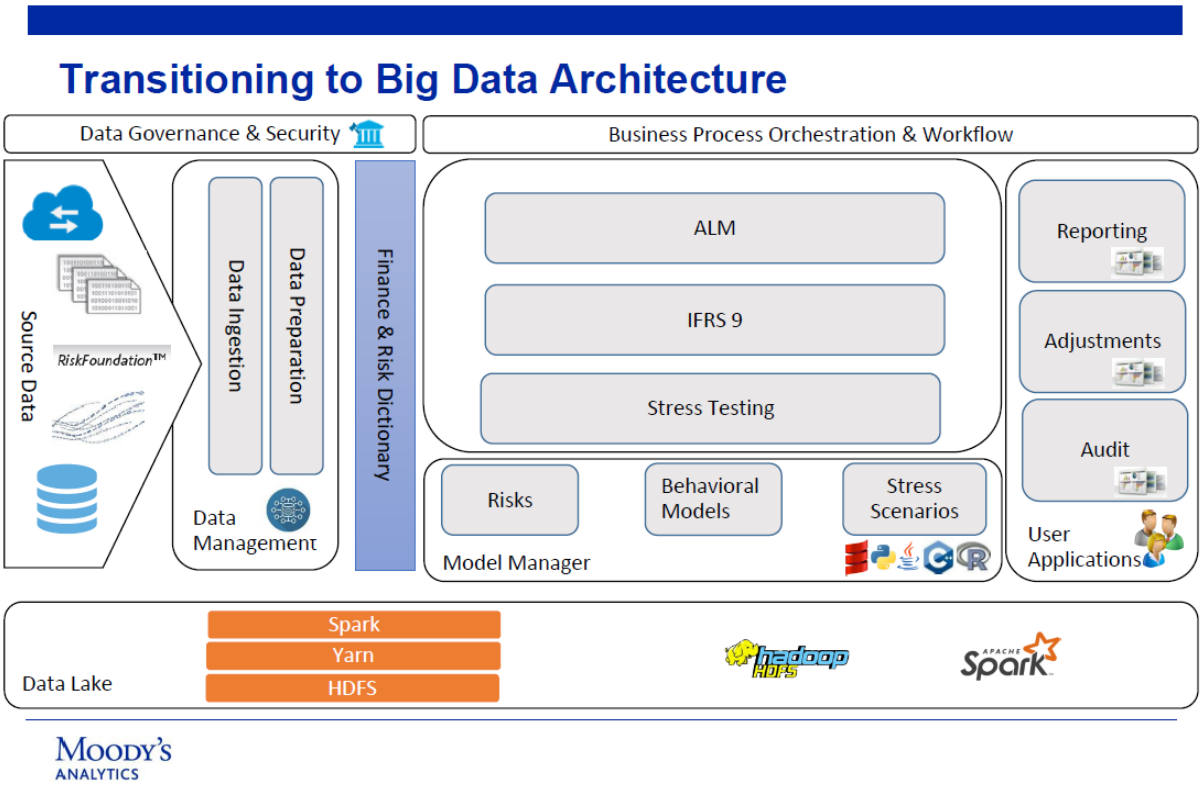


Figure 4: Moody's Analytics (2017) IFRS 9 Big Data Architecture Diagram

2.3 Review of Academic Literature

This section will explore academic literature representing the research fields of IFRS, data governance and big data. Figure 5 depicts the nexus of IFRS, big data and data governance literature. As illustrated in the diagram, the focus of this research is at the junction of these three research fields. This study is concerned with potential literature gaps which may exist at this junction. Sections in grey represent binary relationships between the fields which are also of interest for this study.

This section will examine literature from the IFRS, big data and data governance research fields before concluding with a declaration of a preliminary literature gap.

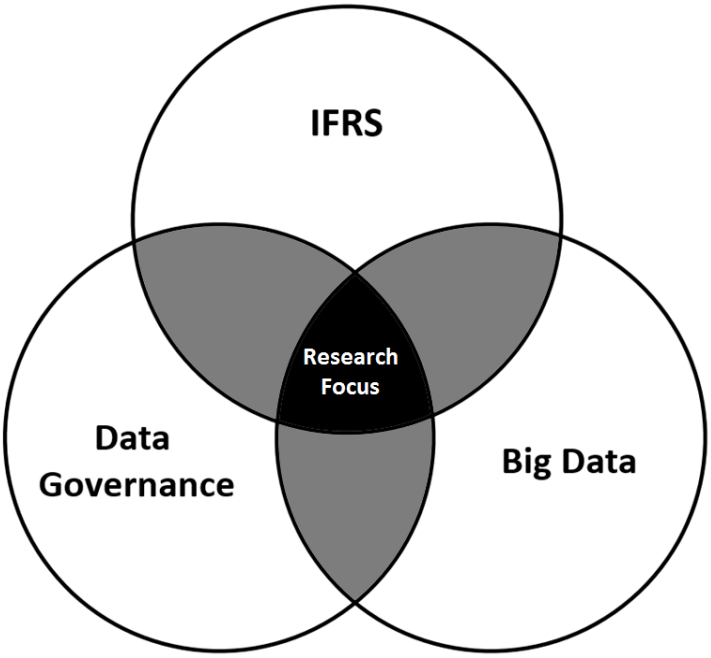


Figure 5: The nexus of IFRS, Big Data and Data Governance

2.3.1 Prior Research on International Financial Reporting Standards

This section will explore current research trends in extant IFRS literature. Uniformity of accounting standards has been a major agenda item for accounting practice for over a century. A key focal point for IFRS research is on harmonisation, which is achieved by "setting limits to the difference between financial reports" (Van der Tas, 1988, p. 158). Harmonising financial reports can refer to either the "degree of disclosure or the accounting method to be applied" (Van der Tas, 1988, p. 158). There are two types of financial reporting harmonisation, de jure and de facto (Chand and Patel, 2008).

De jure refers to the harmonisation of accounting standards, whereas de facto refers to the harmonisation of accounting practices (Chand and Patel, 2008). Chand and Patel (2008) state that literature on de jure accounting finds "increasing similarities between IFRSs and accounting standards in both developed and developing nations" (p. 85). De facto studies "have established that factors (such as culture, professional experience and type of standards) impact on the interpretation and application of accounting standards" (Chand and Patel, 2008, p. 85). In making this determination, Chand and Patel (2008) cite studies conducted by Hronsky and Houghton, 2001; Schultz and Lopex, 2001; Doupnik and Rithcer, 2003, 2004 and Psaros and Trotman, 2004.

Other aspects of IFRS have also been explored in literature. Soderstrom and Sun (2007) for example reviewed the adoption of IFRS and its impact on accounting quality, finding that literature demonstrates a positive impact of IFRS adoption. Ramanna (2013) studied the international politics of IFRS harmonisation, identifying political considerations for IFRS. Daske et al. (2008) explored the economic consequences of IFRS adoption, identifying statistically significant increases in market liquidity for firms

that mandatorily adopt IFRS (p. 1131). Larson and Street (2004) examined the progress and impediments with IFRS adoption, finding issues including the perceived complicated nature of IFRS standards.

Studies have also examined the relationship between IFRS adoption and the information systems of affected entities. For instance, Taipaleenmäki and Ikäheimo (2013) studied how the harmonisation of financial reporting standards influence a convergence of management and financial accounting. They point out that managerial accounting generation of fair values for financial accounting purposes required under IFRS is facilitated by IT, which makes "calculation and information transfer easier and faster" (p. 331). Firoz, Ansari, and Akhtar (2011) explore the impact of IFRS adoption on the Indian banking industry. They note that IFRS adoption "is expected to have wide-ranging effects at different levels of the IT systems architecture" (p. 279). Grabski, Leech, and Aronson (2011) suggest that the need to prepare financial statements which adhere with the requirements of IFRS "has resulted in the need to modify and extend the ERP system" (p. 59).

There have also been several studies specifically on IFRS 9. Onali and Ginesti (2014) for instance examined market reaction to IFRS 9 adoption events across Europe. In another study, Bishof and Daske (2016) investigated the three criterions stipulated by EU regulation before IFRS standards become binding for EU firms. Knežević, Pavlović, and Vukadinović (2015) compared both IAS 39 and IFRS 9, exploring differences between their credit loss models. Bernhardt, Erlinger, and Unterrainer (2016) summarised the criticism of IAS 39 and discussed IFRS 9's changes from the risk management perspective. Shields (2014) studied the impact of comment letter lobbying on IASB standard setting by focusing on the development of IFRS 9. Mawanane-Hewa (2016) also explored IASB lobbying, with a focus on the extent of interest group influence on IFRS 9 ECL modelling development. Novotny-Farkas (2016) examined the interaction of the ECL approach of IFRS 9 on supervisory rules and the three pillars of bank regulation.

Whilst extant literature has examined the relationship between IFRS standard evolution and the information systems of affected entities (Taipaleenmaki and Ikaheimo, 2013; Firoz et al., 2011; Grabski et al., 2011) no studies to the best of the author's knowledge that specifically explored the impact of the changes introduced by IFRS 9 on the big data information systems and data governance frameworks of affected entities.

To further inspect the potential for a literature gap to exist, the following section will introduce big data, another core theoretical concept related to this research endeavour.

2.3.2 Big Data Literature

Section 2.2 highlighted the pivotal role of big data solutions and methodologies in enabling affected entities to comply with IFRS 9. This section will introduce the concept of big data by drawing upon seminal academic literature.

Malik (2013) identifies big data as "a term commonly associated with massive data sets growing at a rapid pace, [which] also represents complexity and variety in the types of data that are being collected and analyzed" (p. 1). Meijer (2012) summarises the so-called three 'V's of big data: volume, velocity and variety. Volume refers to the amount of data stored; velocity relates to the rapid time associated with generation and collection of data and variety relates to the array of different data types, ranging from "SQL-style relational tuples with foreign/primary key relationships to coSQL-style objects or graphs" (p. 66). Gandomi and Haider (2015) explore two additional big data 'V's, veracity and variability. Veracity "represents the unreliability inherent in some sources of data. For example, customer sentiments in social media are uncertain, since they entail human judgement" (Gandomi and Haider, 2015, p.139) and variability "refers to the variation in data flow rates" (p. 66).

Huwe (2012) proposes that organisations should do whatever possible to harness big data's potential. They explore the ability of big data to improve organisational decision making by providing "solid information, accumulated from a rich variety of sources and delivered in real time" (p. 21). Huwe (2012) also makes mention of data-driven management brought on by big data, which "puts a more solid floor under daring business plans and has delivered results that can be quantified" (p. 21). For a range of industries, big data is capable of unleashing "new organizational capabilities and value" (Davenport et al., 2012, p. 22). McAfee and Brynjolfsson (2012) note that the type of data in big data sets is "often unstructured - not organised in a database - and unwieldy" (p. 63). They also discuss five management challenges associated with the rise of big data: leadership, talent management, technology, decision making and company culture.

One of the capabilities facilitated by the increase in big data adoption is advanced analytics, which Bose (2009) defines as "applying advanced analytical techniques to data to answer questions or solve problems" (p. 156). Fundamental concepts of advanced analytics are data integration and data mining (Bose, 2009). Due to the evolution of data mining technological capabilities organisations are now capable of integrating various databases into data warehouses, the core facilitator of a business intelligence (BI) program (Bose, 2009). Bose (2009) warns that "to execute a successful BI strategy, the IT infrastructure must be aligned with business needs in a way that the infrastructure supports the business in achieving goals and objectives" (p. 158).

Malik (2013) suggests that the world is "becoming increasingly instrumented and interconnected, with a proliferation of information" (p. 12). As the world evolves in this manner, Malik (2013) proposes that "organizations now have the opportunity to realize even more value from their information assets" (p. 12). However, Malik (2013) warns of the paradox of data value, that if data is an entity's most valuable assets "then why does it not appear in any company balance sheets and regulatory filings, like brand value does?" (p. 12). The suggestion that data can be entity's most valued asset is highlighted in recent high-

profile data breaches, such as the Equifax breach of 2017 in which 143 million U.S and Canadian individuals had sensitive financial details stolen from the firm (Womack, Robertson and Riley, 2017).

The findings of Fosso et al.'s (2015) big data literature review and case study suggested that "the big data revolution is evolving and organizations should embrace it to build superior capabilities which can become a decisive competitive advantage" (p. 24). They call for future research that develops "explanatory and predictive theories" (p. 24) which can help to grow and improve the big data knowledge domain. Fosso et al. (2015) also stress that future research must seek to address the managerial and operational issues aligned with big data adoption. Accordingly, the succeeding section will introduce the concept of data governance.

2.3.3 Data Governance Literature

This section will introduce the concept of data governance by referring to seminal academic literature from the research field. Data governance shares many characteristics with IT governance, which in turn is derived from the concept of corporate governance, defined by the ASX Corporate Governance Council (2014) as "the framework of rules, relationships, systems and processes within and by which authority is exercised and controlled within corporations." (p. 3).

Weill and Ross (2004) propose an IT governance framework which connects an entity's board with key assets, including human resources, financial assets, physical assets, as well as information and IT assets. They define IT governance as "specifying the decision rights and accountability framework to encourage desirable behaviour in the use of IT" (p. 8). Weil and Ross (2004) refer to information and IT assets as "digitized data, information, and knowledge about customers, processes performance, finances, information systems and so on" (p. 6). They propose that entities can learn from financial and corporate governance in their approach to the governance of information and IT.

Wende (2007) emphasises that "data governance is not a full subset of IT governance" (p. 419), postulating that both data governance and IT governance are uniform concepts and evolve alongside corporate governance (p. 419). Otto (2011) defines data governance as "a companywide framework for assigning decision-related rights and duties to be able to adequately handle data as a company asset" (p. 47). The notion of data governance is structured on the perception of data as an integral company asset (Otto, 2011). Data governance frameworks guide organisations into specifying which actors are responsible for data asset related decision making and are also pivotal in ensuring data quality management (DQM) (Otto, 2011).

Wende (2007) discusses the notion of DQM, which they define as the focus "on the collection, organisation, storage, processing, and presentation of high-quality data" (p. 417). This is an important for entities affected by IFRS 9, as their ability to analyse financial assets within the expected credit loss model is reliant upon analysing high-quality data assets. Organisations leverage data governance to "implement

corporate-wide accountabilities for DQM that encompass professionals from both business and IT" (Wende, 2007, p. 417). The concept of DQM appears to be at the centre of data governance, as Wende (2007) explains that data governance is a type of medium through which appropriate standards for optimal DQM are disseminated throughout an entity.

Khatri and Brown (2010) developed a widely-used data governance framework intended to guide research on critical data governance related concerns. The framework encompasses five decision domains: data principles, data quality, metadata, data access and data lifecycle. Within their data governance framework, Khatri and Brown (2010) propose domain decisions which correspond to each of their five data governance domains. For the data principles decision domain, the domain decision "how does the regulatory environment influence the business use of data?" (p. 149) is proposed. The data quality decision domain has three associated domain decisions; "what are the standards for data quality with respect to accuracy, timeliness, completeness and credibility?" (p. 149), "what is the program for establishing and communicating data quality?" (p. 149) and "how will data quality as well as the associated program be evaluated?" (p. 149).

When exploring the data principles decision domain further, Khatri and Brown (2010) note that considering the regulatory environment of an organisation is important when forming data principles, as it may influence how the organisation is to use its data assets. Khatri and Brown (2010) reflect upon the impact of regulations which relate to an organisation's data access policies and standards, such as the Graham-Leach Bliley Act (p. 151). They do not however further explore how changes in regulations impact on data governance frameworks or specify domain decisions that dive deeper into the regulatory context. As a result, it is unclear how evolutions in regulatory requirements, specifically financial reporting standards such as IFRS, are accommodated by Khatri and Brown's (2010) data governance framework.

2.3.4 Summary of Preliminary Literature Gap

This section explored the research topics of IFRS, big data and data governance through an analysis of relevant academic literature. This literature appears to examine harmonisation of international financial reporting standards and how the rise in capabilities offered by big data have been leveraged by an array of industries to improve competitive advantages, open up new opportunities and solve complex social problems. Given the rise of big data, organisations have been encouraged to review their governance of data assets to manage data quality and steward its use. Extant literature, however, does not appear to have specifically explored the impact of the evolution of IFRS on the data governance frameworks and big data information systems infrastructures of affected entities. Moreover, extant literature appears to have not examined how entities affected by IFRS standard evolution can leverage their capability to conduct big data analytics to comply. This is problematic, as the current IFRS 9 phenomenon and cannot be explained through empirical research.

To confirm that these preliminary literature gaps are indeed accurate and represent the current state of financial accounting, data governance and big data bodies of research a structured literature review (SLR) will be conducted. The employment of a SLR will complement the literature review conducted thus far and ensure that no seminal literature is overlooked. The succeeding section will introduce this study's SLR.

2.4 Structured Literature Review

One of the purposes of literature reviews is to guide future studies (Petticrew and Roberts, 2008). Massaro, Dumay, and Guthrie (2016) state that "a literature review needs to critique an existing field of knowledge before it can offer a path towards future research by empirically developing research questions" (p. 774). Due to the increase in literature review methodology adoption (Arksey and O'Malley, 2005), several methods have been established (Massaro et al., 2016). Massaro et al. (2016) provide examples of these methods, such as a "systematic review, meta-analysis, rapid review (traditional literature review; narrative review; research synthesis; and SLR" (p. 769). Differentiation between each method can be achieved through an examination of the type of rules and structure implemented (Massaro et al., 2016). Massaro et al. (2016) place literature review methods on a continuum stretching from the implementation of 'no rules to 'rigid rules'. As seen in Figure 6, SLR falls on the 'rigid rules' end of the continuum.

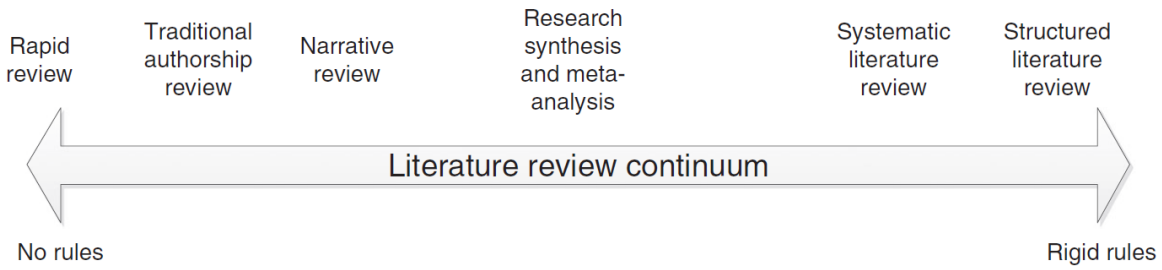


Figure 6: Literature Review Continuum (Massaro, Dumay, and Guthrie, 2016, p. 769)

Massaro et al. (2016) suggest that SLRs can be used to "open up new avenues for research to which the traditional approach may not provide access" (p. 769). This study will utilise a SLR method to confirm the validity of the preliminary literature gap identified in the preceding section and to ensure that it is indicative of extant literature. The removal of researcher bias and minimisation of seminal article avoidance are main advantages of adopting a SLR approach (Massaro et al., 2016). These characteristics will allow for this study's preliminary literature gap to be thoroughly tested.

This study's SLR comprises of four phases: 1) Literature Review Research Question Definition, 2) Search Query Development and Academic Database Selection, 3) Literature Acquisition and 4) Abstract Analysis.

2.4.1 Phase 1: Structured Literature Review Research Question Definition

To guide this study's critique of the IFRS, data governance and big data bodies of knowledge the SLR will seek to answer the following questions:

1. What is the current state of interrelated IFRS, data governance and big data research?
2. What themes exist within current IFRS, data governance and big data literature?
3. Has extant literature examined the relationship between IFRS evolution and its potential impact on data governance and big data adoption within affected entities?

2.4.2 Phase 2: Search Query Development and Academic Database Selection

To identify literature relating to the research fields of IFRS, data governance and big data fifteen search strings were prepared and are outlined in Table 1. It was important to probe academic literature databases that are held in high regard, returned peer-reviewed material and permitted an export of search results to a Bibtex file. Four academic databases were identified as meeting these requirements and were used in this study: EBSCOhost Business Source Premier (EBSCO Industries Incorporated, 2017), ScienceDirect (Elsevier, 2017a), Scopus (Elsevier, 2017b) and Emerald Management (Emerald Publishing Limited, 2017).

2.4.3 Phase 3: Literature Acquisition

The literature acquisition phase involved querying the four databases using the search strings identified in Table 1. To ensure high calibre literature was reviewed, filters were applied requesting only peer-reviewed journal articles. Although IFRS 9 was introduced in 2014, IFRS and the IASB have existed since 2001 and organisations have been using information systems to produce financial statements for decades. As such, no time-related filters were applied to the queries.

The results of each database search query were exported into Bibtex format and then converted to comma separated value (CSV) files using Jabref (The JabRef Team, 2017). Once each database had been queried, search results exported and converted into CSV, the results were combined into one Excel worksheet. There was a total of 2,930 search results for the fifteen search queries against the four academic literature databases. After removing 1,062 duplicates (duplicated through the combination of author, title, journal name and year), 1,868 distinct journal articles remained.

Table 1: Structured Literature Review Search Queries

#	Concept 1		Concept 2		Concept 3		Concept 4
1	"big data"	AND	"IFRS"	OR	"international financial reporting standards"		
2	"data governance"	AND	"big data"				
3	"data governance"	AND	"readiness"				
4	"data governance"	AND	"adoption"				
5	"data governance"						
6	"data governance"	AND	"accounting"	OR	"accounting information systems"		
7	"data governance"	AND	"success"	OR	"success factors"		
8	"data governance"	AND	"IFRS"	OR	"international financial reporting standards"		
9	"IFRS 9"	AND	"information systems"				
10	"IFRS 9"	AND	"adoption"				
11	"IFRS 9"	AND	"information technology"				
12	"information systems"	AND	"IFRS"	OR	"international financial reporting standards"		
13	"information systems"	AND	"adoption"	AND	"IFRS"	OR	"international financial reporting standards"
14	"information technology"	AND	"IFRS"	OR	"international financial reporting standards"		
15	"information technology"	AND	"adoption"	AND	"IFRS"	OR	"international financial reporting standards"

2.4.4 Phase 4: Abstract Analysis

Abstracts of the acquired articles were individually reviewed to identify literature relevant to the research fields of IFRS, data governance and big data. An article was deemed relevant if its abstract suggested the article addressed the relationship between IFRS, data governance and big data. Should literature discuss the relationship between any financial regulations and information systems, data governance and big data it was also deemed relevant. Furthermore, literature was deemed relevant if it explored IFRS, data governance and big data topics in binary relationships (articles on both data governance and big data; IFRS and data governance or big data and IFRS). The objective of this phase was to identify multidisciplinary literature, studies which cross the boundaries of the IFRS, data governance and big data research fields.

From an analysis of 1,868 journal article abstracts for relevance, 164 articles were deemed to be relevant. Irrelevant financial accounting articles tended to explore topics such as investor reactions to IFRS 9 changes (Onali and Ginesti, 2014) or the introduction of financial reporting standards into new jurisdictions (Emmanuel Iatridis, 2012). Information systems articles which were deemed to be irrelevant included those focusing on rather technical aspects of big data analytics (Li, Thomas, and Osei-Bryson, 2016) and the adoption of eXtensible Business Reporting Language (XBRL) (Shan and Troshani, 2016).

2.4.5 Structured Literature Review Results

The abstract analysis phase led to the categorisation of journal articles into three themes which will be defined and examined in sections 2.6.5.1 through to 2.6.5.3.

2.4.5.1 Theme 1: Data Governance

Several relevant articles discussed theoretical considerations for data governance. Examples of literature belonging to this theme include Khatri and Brown's (2010) article, previously discussed when introducing the concept of data governance. Palczewska, Fu, Trundle, Yang, Neagu, Ridley, and Travis (2013) examine data management of toxicity information and "extend the governance policies to model objects to support efficient model management" (p. 570). Sedenberg and Mulligan (2015) explore "expert and collaborative data governance" (p. 1692) as one of the four principles they recommend in guiding the development of an information sharing policy that considers cybersecurity threats and implications.

Weber, Otto, and Österle (2009) introduce a data governance contingency model which "facilitates company-specific design of data governance" (p. 21). Their use of contingency theory in the model "respects the fact that each company needs a specific data governance configuration that fits a set of context factors" (p. 3). Otto (2012) conducted a case study on Master Data Management (MDM) in a well-known multinational entity, the Bosch Group. They define master data as "data about the characteristics of key business objects in a company" (p. 338) and found the process of designing master data architectures necessitates both organisational and technical considerations, requiring the involvement of several stakeholders.

Some papers differed in their approach as to what exactly was being governed: data or information. An example of this is an article written on information governance by Kooper, Maes, and Lindgreen (2011). They refer to and draw similarities from Khatri and Brown's (2010) data governance framework, however, suggest that information is derived from data and unlike data or IT, information is an intangible asset. They define information governance as "establishing an environment and opportunities, rules and decision-making rights for the valuation, creation, collection, analysis, distribution, storage, use and control of information" (pp. 195-196).

Kooper et al.'s (2011) article explores the inadequacy of IT governance to accommodate the unique needs for information use within organisations and seeks to inspire future research into the field of information governance. They acknowledge the role of compliance initiatives, such as the Sarbanes-Oxley Act (SOX) and Basel II, in driving the rise of interest in IT governance while observing that "information is the missing linking pin between business and IT" (p. 195).

2.4.5.2 Theme 2: Big Data Governance

The second theme identified from literature deemed relevant related to the accommodation of the big data concept in data governance frameworks and the accounting function. Tallon's (2013) article is highly representative of this theme. They identify the development of governance mechanisms which accommodate the growing quantities of data and innovation as a challenge for organisations. Their perspective on data governance seems to reflect upon the nature of big data, suggesting that "data governance is a reflection of how organisations value their diverse and expanding portfolio of data assets" (p. 32). Like Weber et al. (2009), Tallon (2013) suggests that one-size-fits-all approaches to data governance do not work and organisations need to implement governance models which reflect their requirements.

Fosso et al. (2015) conducted both a systematic literature review and case study on big data's potential to increase management capabilities. They found that in the extant literature "very few empirical studies have been conducted to assess the real potential of 'big data'" (p. 3) and aimed to contribute to this gap through the development of a big data conceptual literature framework. Their findings highlight the importance of "big data driven organizational culture and capabilities" (p. 23) and data quality. Fosso et al. (2015) call for future research that explores "topics such as, leadership, talent management, technology and tools, information eco-systems, company culture, data privacy, business value and decision making process" (pp. 24-25).

Warren, Moffitt, and Byrnes (2015) note that "the rising importance of Big Data will significantly impact accounting" (p. 397). Their study outlines how varying data types associated with big data, such as video, images, audio and text, have opportunities for use in both managerial and financial accounting. Warren et al. (2015) use long-lived internet software agents as an example assisting "in the valuation of otherwise hard-to-value assets by using extensive automated Internet search methods running over extended periods of time" (p. 403). Riggins and Klamm (2017) authored an educational case study which aims to increase the reader's "understanding of data governance in an era of sophisticated analytics and big data where corporate data integrity and data quality may be at risk" (p. 23). Their study provides an example of the academic interest in the relationship and interaction between data governance, big data and the accounting function.

2.4.5.3 Theme 3: Regulation Compliance

The final theme identified amongst the relevant literature accounts for several articles which discussed the relationship between financial regulations, such as SOX and Basel II, on data management practices. While literature in the first theme, 'Data Governance', did at times mention the influence of regulations this was not their primary focus, unlike articles residing in this theme. The first example of such literature is Prorokowski and Prorokowski's (2015) article which explores how financial institutions can prepare themselves to comply with the Basel Committee on Banking Supervision's (BCBS) Principles for Effective Risk Data Aggregation and Risk Reporting. Their article addresses the need for financial institutions to "resolve any limitations pertaining to the risk IT systems that support data quality" (p. 70) and "to establish independent functions validating their data aggregation processes" (p. 70).

Tran, Zdun, Oberortner, Mulo, and Dustdar (2012) refer to IFRS alongside SOX and Basel II as examples of an increasing variety of compliance obstacles organisations need to accommodate in their service orientated architectures. Like Weber et al. (2009) and Tallon (2013), Tran et al. (2012) refer to the inability of one-size-fits-all approaches to meet data related regulatory challenges, and as such organisations are addressing compliance concerns "on a per-case basis using ad-hoc, hard-coded solutions" (p. 1). Multiple stakeholder challenges are also noted and relate to the need for compliance experts to work alongside IT actors within regulated entities. This is due to the "highly abstract legal writing" (p. 2) characteristic of regulations and the need for compliance experts to translate regulations into requirements that can then be implemented into IT infrastructures (p. 2). Tran et al. (2012) propose a model-driven development approach to overcome these challenges, which aims to "enable companies to develop and then evolve and maintain a customized business compliance framework" (p. 5). While Tran et al. (2012) mention IFRS as one of the compliance concerns for organisations, it is not explicitly addressed in the body of the article and their research model fails to suggest how financial reporting requirements are accommodated by an organisation's data governance framework or the big data information systems infrastructures.

2.4.6 Structured Literature Review Conclusion

This study's structured literature review has identified three themes from 164 peer-reviewed journal articles deemed relevant to the examination of the relationship between IFRS, data governance and big data. Table 2 provides some examples of literature corresponding within the three identified themes. The limited examples provided are those published in journals listed on the Australian Business Deans Councils (2017) journal quality list or in Schimago Journal and Country Rank's (Scimago Lab, 2017) first and second best-ranking quartiles. This theme identification has answered the second research question set forth for this literature review in section 2.4.1.

Furthermore, this theme identification has led to the understanding of the current state of academic research in these research fields. Therefore, the first question for this SLR has also been addressed. It

appears that the relevant peer-reviewed journal articles analysed in this review, indicative of the current state of IFRS, data governance and big data research, do not substantially explore the relationship between these three concepts. More specifically, extant literature does not examine how the evolution in IFRS impacts upon the data governance frameworks and big data information systems of affected entities. Moreover, extant literature does not explore the effect of organisational big data analytics capabilities on compliance with new IFRS standards. As such, the third literature review research question has been answered.

Table 2: Structured Literature Review Theme Outline and Literature Examples

Theme	Literature	
Data Governance Centric focus on data governance frameworks, policies and the management of data assets.	• Khatri and Brown (2010) • Begg and Caira (2012) • Thompson, Ravindran, and Nicosia (2015)	• Kooper et al. (2011) • Khatri, (2016) • Otto (2012) • Weber et al. (2009) • Palczewska et al. (2013)
Big Data Governance Explores the impact of big data on data governance, Information Systems management and the accounting function.	• Warren et al. (2015) • Tallon (2013) • Krishnamurthy and Desouza (2014)	• Sadiq and Indulska (2017) • Fosso et al. (2015) • Owrang and Grupe (1997)
Regulation Compliance Focus on need to consider regulatory compliance in IT management.	• Prorokowski and Prorokowski (2015) • Tran et al. (2012)	• Wagenhofer (2016) • Bonollo and Neri (2012)

2.5 Literature Review Gap Validation

Section 2.4 outlined how this study has leveraged the rigid rules of SLR methodology to explore the relevancy of the preliminary literature gap identified in section 2.3.4 to extant IFRS, data governance and big data academic literature. This SLR resulted in the identification of three literature themes and the confirmation that extant literature from the research fields of IFRS, data governance and big data does not specifically examine the relationship between IFRS evolution and the data governance frameworks and big data information systems infrastructures of affected entities. Additionally, the SLR has confirmed that extant literature does not examine the effect of organisational big data analytics capabilities on compliance with new IFRS standards. Accordingly, the preliminary literature gaps have been validated and confirmed.

This research endeavour will aim to contribute to the body of knowledge by empirically exploring these literature gaps. The following section will introduce the theoretical framework to be leveraged in this endeavour.

2.6 Theoretical Framework

The primary theoretical framework to be used in this study is information systems success, first introduced by DeLone and McLean (1992). This framework is to be complemented with the concepts of organisational big data analytics capabilities (Akter et al., 2016; Fosso et al., 2017) and attitudes towards IFRS 9 compliance. The inclusion of these concepts will facilitate the exploration of the relationship between IFRS 9 compliance with information systems characteristics of affected entities, in particular, big data analytics capabilities and governance.

2.6.1 Information Systems Success

Urbach, Smolnik, and Riempp (2009) suggest that there is no definitive definition of information systems success. They state that "from a software developer's perspective, a successful information system is completed on time and under budget" (p. 316). Users of information systems may find such systems successful "if it improves their work satisfaction or work performance" (p. 316). Organisations may find information systems successful if they contribute "to the company's profits or creates a competitive advantage" (p. 316).

At the inaugural International Conference on Information Systems (ICIS) Keen (1980) called for research that addresses the dependent variable for management information systems research. In response to Keen's (1980) call, DeLone and McLean (1992) developed a taxonomy of research on information systems success, identifying "nearly as many measures as there are studies" (p. 61). Their synthesis of approximately 180 articles led to the definition of 6 constructs which formed their original information systems success model. These constructs are system quality, information quality, use, user satisfaction, individual impact and organisational impact.

A decade later, DeLone and McLean (2003) published a revised version of their original information systems success model. This updated model addressed criticisms of the original model, particularly regarding its completeness and validity (Urbach and Muller, 2012). One of the key changes was the measurement of system quality and information quality independently, with the addition of service quality as an independent variable. Intention to use was added as a potential substitute for the use construct, to capture users attitude rather than behaviours. DeLone and McLean (2003) also merged individual impact and organisational impact into a new construct, net benefits. DeLone and McLean's (2003, p. 24) updated information systems success model is illustrated Figure 7.

Urbach and Muller (2012) state that the DeLone and McLean's (2003) updated IS success model can be interpreted as follows:

> "a system can be evaluated in terms of information, system, and service quality; these characteristics affect subsequent use or intention to use and user satisfaction. Certain benefits will be achieved by using the system. The net benefits will (positively or negatively) influence user satisfaction and the further use of the IS." (Urbach and Muller 2012, p. 4).

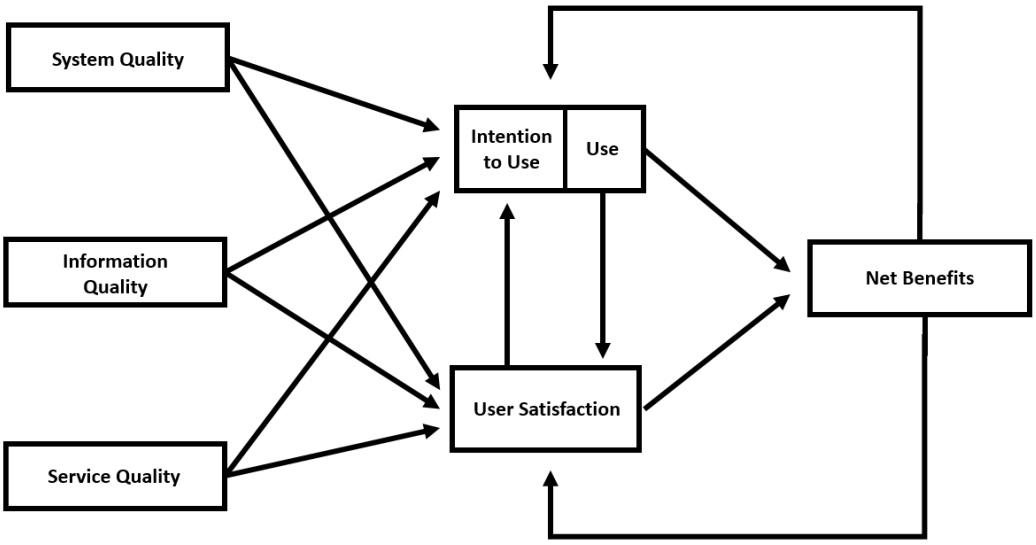


Figure 7: The Updated DeLone and McLean (2003, p. 24) Information Systems Success Model

DeLone and McLean (2003) call for research which tests and challenges their information systems success model. Confirmation and validation of the relationships between the success dimensions is also encouraged by DeLone and McLean (2003). However, it is important that the application of success dimensions in future endeavours is dependent upon the research objectives and the context being studied (DeLone and McLean, 2003).

In the context of IFRS 9 implementation, affected organisations may consider success to be associated with the degree to which their information systems can accommodate the added data acquisition, analysis and governance demands required for compliance. As such, DeLone and McLean's (2003) updated information systems success model is a advantageous framework to leverage in the quest to understand the dimensions behind a successful use of information systems to accommodate the evolution of IFRS standards.

2.6.2 Organisational Big Data Analytics Capabilities

DeLone and McLean's (2003) updated information systems success model will be expanded through the addition of the concept of organisational big data analytics capabilities. The inclusion of this concept

permits this study to explore how an organisation's ability to conduct and govern big data analytics can influence the intention of users to use an information system, a relationship which DeLone and McLean's (2003) theoretical model does not accommodate.

Akter et al. (2016) draw upon resource-based theory when introducing big data analytics, which they define as "the distinctive capability of firms in setting the optimal price, detecting quality problems, deciding the lowest possible level of inventory of, identifying loyal and profitable customers in big data environment" (pp. 113 – 114). Fosso et al. (2017) provide an alternative definition, referring to big data analytics as the "a holistic approach to managing, processing and analysing the 5 V data-related dimensions (i.e., volume, variety, velocity, veracity and value) to create actionable ideas for delivering sustained value, measuring performance and establishing competitive advantages" (p. 365).

The concept of big data analytics *capability* is defined by Akter et al. (2016) as "the competence to provide business insights using data management, infrastructure (technology) and talent (personnel) capability to transform business into a competitive force" (p. 114). Big data analytics capability is grounded on information technology capability (Fosso et al., 2017), defined by Bharadwaj (2000) as a firm's "ability to mobilize and deploy IT-based resources in combination or co-present with other resources and capabilities" (p. 171). Big data analytics capability is a critical organisational capability (Fosso et al., 2017), providing opportunities for the enhancement of competitive advantage.

Akter et al. (2016) developed a research model to measure big data analytics capability. Their model features 11 sub-categories, categorised into three capabilities: big data analytics management, big data analytics technology and big data analytics talent. Big data analytics management capability refers to the importance of "ensuring that solid business decisions are made applying proper management framework" (Akter et al., 2016, p. 118) when managing big data analytics. Big data analytics technology capability "refers to the flexibility of the big data analytics platform … in relation to enabling data scientists to quickly develop, deploy, and support a firm's resources." (Akter et al., p. 119). Big data talent capability is defined as the analytics professional's ability "to perform assigned tasks in the big data environment" (Akter et al., 2016, p. 119).

Fosso et al. (2017) also devised a big data analytics capability research model which draws upon big information technology capability literature, particularly Kimm Shin, and Kwon's (2012) information technology capability model. Fosso et al.'s (2017) model features big data analytics capability as "a third-order, hierarchical model manifested in three second-order constructs" (p. 358), which are big data analytics infrastructure flexibility, big data analytics management capabilities and big data analytics personnel expertise capability.

Big data analytics infrastructure capability refers to the infrastructure of the big data analytics environment, and its ability "to enable the BDA staff to quickly develop, deploy, and support necessary

system components for a firm" (Fosso et al., 2017, p. 358). Big data management capability refers to the ability of the big data analytics unit to "manage IT resources in accordance with business needs and priorities" (p. 358) in a structured manner. Big data analytics personnel capability "refers to the big data analytics staff's professional ability (e.g., skills or knowledge) to undertake assigned tasks" (p. 358).

Both Akter et al. (2016) and Fosso et al. (2017) explore the effect of big data analytics capabilities on firm performance. They call for research that introduces new variables into their research model. Fosso et al. (2017) note that big data analytics is context specific, and propose that "replications of the conceptual model in other settings would enhance its generalizability" (p. 364). Fosso et al. (2017) call for the development of a "context specific big data analytics capabilities instrument" (p. 364) to study big data analytics capabilities in different contexts.

Industry analysis on the IFRS 9 phenomenon has indicated that one of the key practical challenges associated with implementation of the standard's requirements relates to the volume and complexity of the data required to calculate forward-looking expected credit loss (Deloitte, 2014, 2015, 2016; Ernst and Young, 2017; Moody's Analytics, 2017; Global Public Policy Committee, 2016; European Banking Authority, 2016, 2017). In response to both this suggestion, and the failure of extant literature to examine the relationship between big data and IFRS standards, this study will adopt Akter et al.'s (2016) and Fosso et al.'s (2017) concept of big data analytics capabilities porting it into the research DeLone and McLean's (2003) information system success model as an independent variable.

2.6.3 Attitude Towards IFRS 9 Compliance

The information systems success model of DeLone and McLean (2003) as well as the big data analytics capabilities conceptual models of both Akter et al. (2016) and Fosso et al. (2017) do not address the concept of compliance with financial regulations. This study is motivated by the desire to examine the influence of information systems qualities and organisational big data analytics capabilities on the intention to use such systems and the extent to which industry professionals perceive their entity can comply with IFR9, symbiotic of an evolution in IFRS. As such, the concept of attitudes towards IFRS 9 compliance is to be introduced to the research model.

Extant literature has examined compliance with financial regulations using surveys. For example, Birindeli and Ferretti (2008) conducted a study on compliance practices of Italian financial institutions. Their intention was to observe Italian bank compliance trends over time and used a survey questionnaire method to study 51 financial institutions. Surveys focusing on compliance perceptions have also been conducted regarding SOX. Alexander et al. (2013) conducted a post-SOX implementation compliance survey on 3,138 'corporate insiders' in a bid to examine the effectiveness and efficiency of a particular component of the regulation. The method of the survey questionnaire distribution entailed sending

invitations to participate in the research to managers associated with the companies selected to be studied.

Surveys have also been leveraged to study first-time adoption of IFRS. For instance, Jermakowicz and Gornik-Tomaszewski (2006) surveyed 20 European entities in an effort to examine challenges associated with first-time IFRS adoption. To study these entities, they examined responses from what they refer to as responding officers. Examples of these actors include individuals holding the positions of Accounting Director, Chief Financial Officer, Treasurer as well as project managers responsible for IFRS implementation. As a result of their survey, Jermakowicz and Fornik-Tomaszekski (2006) identified major challenges with first-time adoption of IFRS.

Unfortunately, compliance literature reviewed provided no measurement items for attitudes towards compliance with an impending financial regulatory change. As such, to measure the perception of the industry professionals as to the extent to which they perceive their entity can comply with the requirements of IFRS 9, four measurement items have been devised for this construct and are outlined in Chapter 3, section 3.4. In summary, these measurement items seek to gauge the extent to which the respondents perceive their entity can comply with IFRS 9 in time for the January 1, 2018 deadline.

2.7 Conceptual and Structural Research Models

This study's conceptual research model is illustrated in Figure 8. The model features the introduction of the organisational big data analytics capabilities and attitudes towards IFRS 9 compliance concepts to DeLone and McLean's (2003) updated information systems success model, which has been altered to not include the constructs use or user satisfaction. DeLone and McLean (2003) encourage researchers to alter their success model to fit the context and only use dimensions where they are relevant. It would be more beneficial to study user satisfaction after compliance with the standard is mandatory as the final version of affected entity's compliance frameworks and analytics applications would be in effect.

The research model shown in Figure 9 identifies the hypotheses relevant for each construct relationship as well as the first-order constructs used in hierarchical component models to examine the constructs of organisational big data analytics capabilities, system quality, information quality and service quality. Table 3 defines each construct in the conceptual model and Table 4 defines each first-order construct employed in the hierarchical component models of the research model.

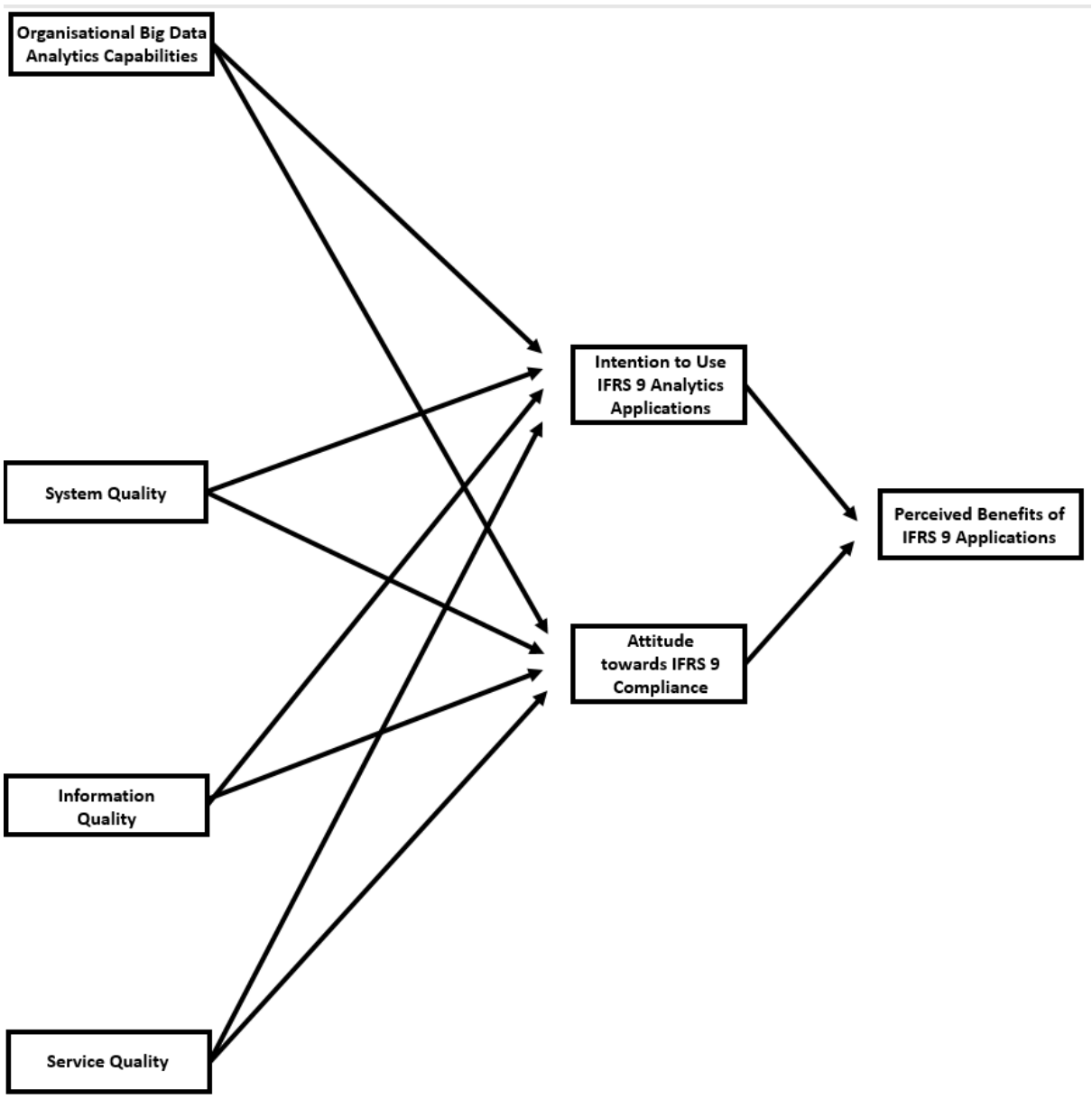


Figure 8: Conceptual Research Model

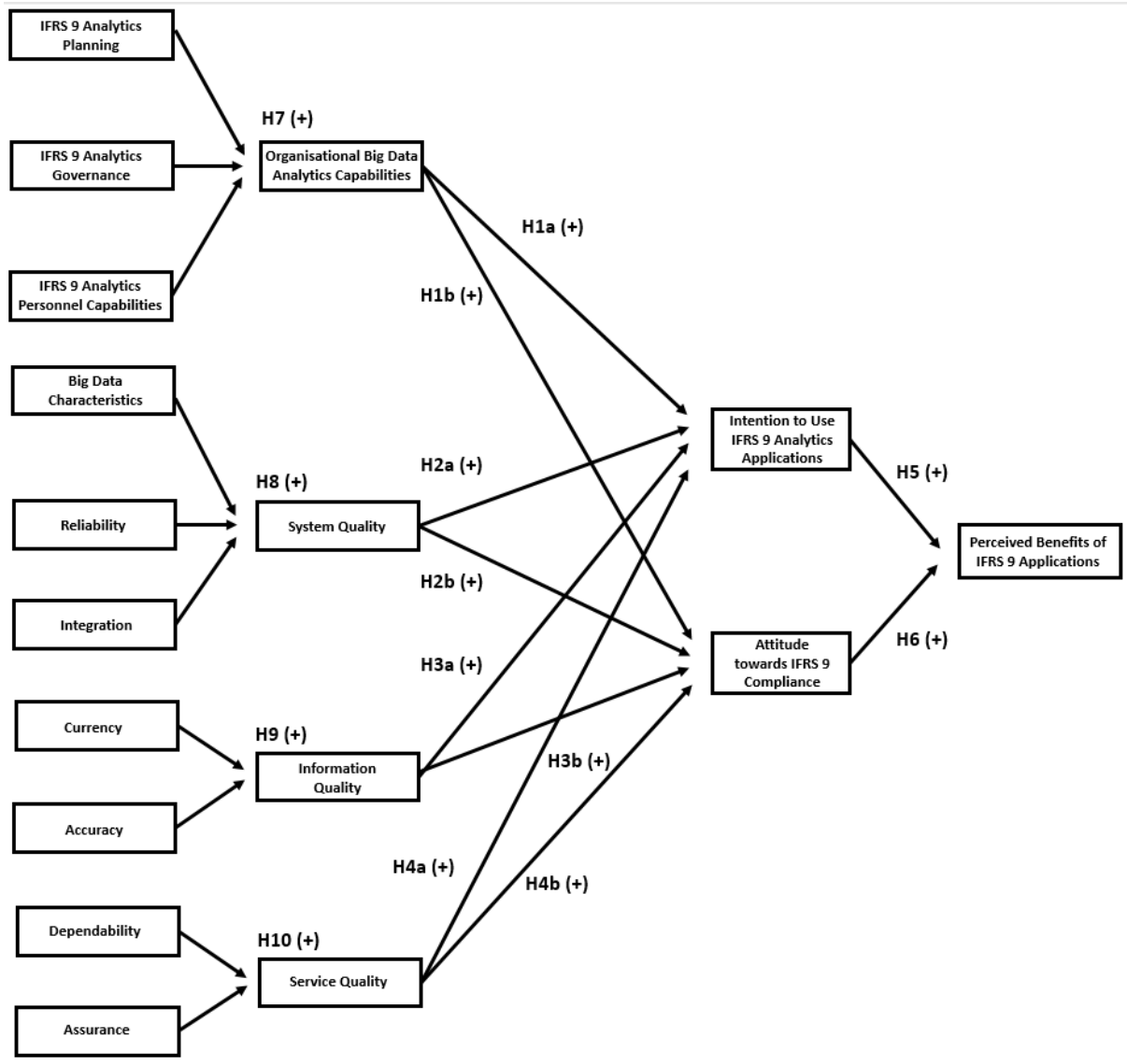


Figure 9: Research Model Identifying Hypotheses

Table 3: Construct Definition

Construct	Definition	Adapted From
Organisational Big Data Analytics Capabilities	The organisational capability to leverage big data analytics technology and approaches to provide financial and credit risk related insights for compliance with IFRS 9 requirements.	Akter et al. (2016) Fosso et al. (2017)
System Quality	The desirable characteristics of the information system infrastructure, with a focus on analytical processing aspects, performance characteristics and big data computing capabilities.	Urbach and Muller (2012, p. 4) DeLone and McLean (2003)
Information Quality	The desirable characteristics of an information system's output, such as up to date financial and credit risk associated data required for compliance with IFRS 9.	Urbach and Muller (2012, p. 5) DeLone and McLean (2003)
Service Quality	The quality of support provided by the information systems support personnel and their ability to maintain the information systems of which IFRS 9 analytics applications are reliant.	Urbach and Muller (2012, p. 5) DeLone and McLean (2003)
Intention to Use IFRS 9 Analytics Applications	The degree and manner in which the information system is intended to be utilised by users within the affected entities for compliance with IFRS 9.	Urbach and Muller (2012, p. 6) DeLone and McLean (2003) Almutairi and Subramanian (2005) Iivari (2005)
Attitude towards IFRS 9 Compliance	The extent to which industry professionals perceive their entity can comply with the requirements of IFRS 9 in time and in full.	Self-Developed Construct, motivated by: Birindeli and Ferretti (2008) Alexander et al. (2013) Jermakowicz and Gornik-Tomaszewski (2006)
Perceived Benefits of IFRS Applications	The extent to which IFRS 9 applications are contributing to the success of varying stakeholders within the affected entity.	Urbach and Muller (2012, p. 6) DeLone and McLean (1992) DeLone and McLean (2003)

Table 4: First Order Construct Summary

Second Order Construct	First Order Construct	Definition	Source
Organisational Big Data Characteristics	IFRS 9 Analytics Planning	The ability of the IFRS 9 big data analytics unit to determine how big data based models can improve compliance with the standard.	Akter et al. (2016, p. 118)
	IFRS 9 Analytics Governance	The ability of the IFRS 9 big data analytics unit to manage IT resources in accordance with business needs and priorities.	Akter et al. (2016, p. 118)
	IFRS 9 Analytics Personnel	The entity's analytics personnel's professional ability (e.g., skills or knowledge) to perform IFRS 9 related analytical tasks in the big data environment.	Akter et al. (2016, p. 119) Fosso et al. (2017, p. 358)
System Quality	Reliability	The degree to which a system is dependable (e.g., technically available) over time.	Nelson et al. (2005, p. 206)
	Integration	The degree to which a system facilitates the combination of information from various sources to support business decisions.	Nelson et al. (2005, p. 206)
	Big Data Characteristics	The big data characteristics of the information systems under examination.	Fosso et al. (2015)
Information Quality	Accuracy	The degree to which information is correct, unambiguous, meaningful, believable, and consistent.	Nelson et al. (2005, p. 204)
	Currency	The degree to which the information precisely reflects the current state of the world that it represents.	Nelson et al. (2005, p. 204)
Service Quality	Dependability	The extent to which the information systems support department strives to improve the information services provided to users.	Gorla et al. (2010, p. 213)
	Assurance	The ability of the information systems support staff to build users' confidence.	Gorla et al. (2010, p. 213)

2.8 Hypotheses Development

This section will outline the development of the study's hypotheses. Subsections 2.8.1 through to 2.8.5 will develop hypotheses associated with the first research question:

> **Do organisational big data analytics capabilities, system quality, information quality and service quality influence the intention to use IFRS 9 analytics applications and attitudes towards IFRS9 compliance?**

Subsection 2.8.6 will then develop hypotheses associated with the second research question:

> **Does intention to use IFRS 9 analytics applications and attitude towards IFRS 9 compliance influence perceived benefits of IFRS 9 applications?**

The remainder of this section will develop hypotheses for the remaining 4 research questions:

> **What constitutes valid and reliable scales for measuring organisational big data analytics capabilities?**
>
> **What constitutes valid and reliable scales for measuring system quality?**
>
> **What constitutes valid and reliable scales for measuring information quality?**
>
> **What constitutes valid and reliable scales for measuring service quality?**

2.8.1 Intention to Use IFRS 9 Analytics Applications

Urbach and Muller (2012) define DeLone and McLean's (2003) intention to use construct as "the degree and manner in which IS is utilized by its users" (p. 7). In this study, the construct intention to use seeks to measure the industry professional's behavioural intentions to use their entity's IFRS 9 analytics applications. An exemplary measure of intention to use is frequency of use (Urbach and Muller, 2012). This study leverages the frequency of use measurement item to study behavioural intention to use, similar to both Almutairi and Subramanian (2005) and Iivari (2005).

An understanding of the industry professional's intention to use their entity's IFRS 9 analytics applications and the impact on these intentions from organisational big data capabilities and quality characteristics of their entity's information systems may lead to an understanding of what factors are critical for the successful implementation of these applications. Furthermore, assessing the influence intention to use IFRS 9 applications has on the perceived benefits of IFRS 9 applications may help to validate the importance of these applications with regards to the operations and strategies of affected entities.

2.8.2 Organisational Big Data Analytics Capabilities

Fosso et al. (2017) define big data analytics as "a holistic approach to managing, processing and analysing the 5 V data-related dimensions (i.e., volume, variety, velocity, veracity and value)" (p. 356) and its

purpose is to “create actionable ideas doe delivering sustained value, measuring performance and establishing competitive advantages” (p. 356). Akter et al. (2016) defines big data analytics capabilities as deriving organisational benefits, such as price setting optimisation, quality control and inventory efficiency maximisation in the big data environment.

It is expected that entities affected by changes introduced by IFRS 9 will need to leverage big data analytics to comply. An IFRS 9 IT architecture diagram proposed by Chartis Research (2016, p. 29) identifies the use of big data artefacts, such as data marts, online analytical processing cubes and data warehouses as sources for IFRS 9 applications, such as early warning systems and dashboards. Should affected entities have a high degree of organisational big data analytics capability, this may positively affect the intention of industry actors within the affected organisations to use IFRS 9 analytics applications to comply. Thus, the following hypothesis is proposed:

Hypothesis 1a: Organisational Big Data Analytics Capabilities positively affect Intention to Use IFRS 9 Analytics Applications

As mentioned in section 2.2.3, Chartis Research (2016) and Moody’s Analytics (2017) proposed IT and big data architecture diagrams which demonstrate the crucial role of big data analytics capabilities in compliance with requirements introduced by IFRS 9. As such, it is anticipated that the capability of affected entities to leverage big data analytics will positively affect the extent to which industry actors within the affected entities perceive their entity will comply with the requirements of IFRS 9. Therefore, the following hypothesis is proposed:

Hypothesis 1b: Organisational Big Data Analytics Capabilities positively affect Attitude towards IFRS 9 Compliance

2.8.3 System Quality

Urbach and Muller (2012) describe DeLone and McLean’s (2003) system quality construct as “the desirable characteristics of an information system” (p. 4) and explain that measures of system quality “typically focus on usability aspects and performance characteristics of the system under examination. Urbach and Muller (2012) identified eighteen measures of system quality used in extant literature including data accuracy, efficiency and flexibility. DeLone and McLean (2003) used an e-commerce system as an example when introducing their updated information systems success model. In this example, they explained that the system quality construct “measures the desired characteristics of an e-commerce system” (p. 24).

In this study, system quality refers to the desired characteristics of the information systems used by the affected entity to comply with the requirements of IFRS 9. The IFRS 9 analytics applications referred to throughout this study rely on the characteristics of the information systems under examination in these

hypotheses. If the information systems characteristics are desirable, it is thought that this would have a positive effect on the intention of the industry actors to use IFRS 9 analytics applications which rely on such information systems. Therefore, the following hypothesis is proposed:

Hypothesis 2a: System Quality will positively affect Intention to Use IFRS 9 Analytics Applications

Moreover, should characteristics of the affected entity's information systems be deemed desirable by the industry actors it is thought that this will positively affect the attitude of these industry actors towards their entity's ability to comply with the requirements of IFRS 9. Industry actors would be more concerned about the ability of their entity to comply with IFRS 9 requirements if their entity's information system features undesirable characteristics. Hence the following hypothesis is proposed:

Hypothesis 2b: System Quality will positively affect Attitude towards IFRS 9 Compliance

2.8.4 Information Quality

The information quality construct refers to the desirable characteristics of the information systems output (Urbach and Muller, 2012). Urbach and Muller (2012) provide an example relevant to the information quality construct, being "the information an employee can generate using a company's information system, such as up-to-date sales statistics or current prices for quotes" (p. 5). Urbach and Muller (2012) identify measures of Information Quality such as accuracy, availability, conciseness and reliability.

Information quality also refers to the desirable characteristics of the information system in this study, with the output being the data generated through the information systems used by the IFRS 9 analytics applications of affected entities. Examples of such output include the information communicated by credit risk models, data associated with the scorecard metrics and metadata of the financial instruments requiring analysis for IFRS 9 compliance activities. It is thought that industry professional's intention to use IFRS 9 analytics applications is positively associated with the belief that the output generated by their entity's information systems is of high quality. Therefore a fifth hypothesis is proposed:

Hypothesis 3a: Information Quality will positively affect Intention to Use IFRS 9 Analytics Applications

High quality information systems output is likely to increase the perception of the industry actors that their entity will successfully comply with the requirements of IFRS 9 as the standard, particularly the expected credit loss component, is reliant upon accurate and current financial data depicting the true state of financial instrument portfolios. Should the output generated by the affected entity's information systems be of low quality, it is assumed that industry professionals would be concerned with the ability of their entity to predict financial instrument credit losses or identify significant increases in credit risk. Thus, the following hypothesis is proposed:

Hypothesis 3b: Information Quality will positively affect Attitude towards IFRS 9 Compliance

2.8.5 Service Quality

DeLone and McLean's service quality construct refers to "the support that the users receive from the information systems department and information technology support personnel" (Urbach and Muller, 2012, p. 5). This support can be provisioned through a variety of means such as training, a support hotline and a helpdesk (Urbach and Muller, 2012). In countering the criticism that service quality is simply a derivative of the system quality construct, DeLone and McLean (2003) emphasise the importance of the research context dictating the "appropriate specification and application" (p. 18) of their model and constructs.

In the context of IFRS 9 requirement implementation in affected entities, the service quality construct is an important inclusion because of the emphasis made on the interaction between the information systems, finance and risk divisions of affected entities (European Banking Authority, 2016). For this research, service quality refers to the support industry actors receive or expect to receive from the affected entity's internal or contracted information systems support personnel. If the industry actors think highly of the support received or expected to be received from support personnel, it is anticipated that they are more likely to feel comfortable with their intended use of IFRS 9 analytics applications which depend on the information systems support personnel are maintaining. Therefore, the following hypothesis is proposed:

Hypothesis 4a: Service Quality will positively affect Intention to Use IFRS 9 Analytics Applications

Should industry actors have concerns with the capability of their entity's information systems technology support personnel to maintain the information systems of which the IFRS 9 analytics application depend are reliant, it is anticipated that their confidence in their entity's ability to comply with IFRS 9 requirements will reduce. Therefore, the following is proposed:

Hypothesis 4b: Service Quality will positively affect Attitude towards IFRS 9 Compliance

2.8.6 Perceived Benefits of IFRS 9 Applications

Urbach and Muller (2012) define DeLone and McLean's (2003) net benefits dimension as "the extent to which information systems are contributing to the success of different stakeholders" (p. 7). DeLone and McLean (2003) introduced net benefits when they updated their original information systems success model, with the dimension aggregating a number of information systems impact measures proposed by researchers. Urbach and Muller (2012) explain that "the choice of what impact should be measured depends on the system being evaluated, the purpose of the study and the level of analysis" (p. 8).

For this study net benefits which are to be examined are the benefits which the IFRS 9 analytic applications bring to the affected entity. The measurement items for the perceived benefits of IFRS 9 applications construct are adapted from Mahmood and Soon (1991) and Gorla et al. (2010). These include the

contribution IFRS 9 applications make towards ensuring high efficiency in risk decision making (Mahmood et al., 1991), ensuring good co-ordination amongst functional areas (Gorla et al., 2010), maximising profit margins (Gorla et al., 2010), maximising market share (Gorla et al., 2010) and maximising strategic planning efficiency (Gorla et al., 2010).

Should industry professionals associated with entities affected by IFRS 9 intend to use their entity's IFRS 9 analytics applications, it is anticipated that this will have a positive effect on the perception that such application will positively benefit the entity. As such, the following hypothesis is proposed:

Hypothesis 5: Intention to Use IFRS 9 Analytics Applications will positively affect Perceived Benefits of IFRS 9 Applications

As demonstrated by recent industry reporting and analysis (Deloitte, 2014; Deloitte, 2015; Deloitte, 2016; Ernst and Young, 2016; Ernst and Young, 2017; European Banking Authority, 2016; European Banking Authority, 2017; Global Public Policy Committee, 2016; Moody's Analytics, 2016), compliance with IFRS 9 is a key concern for affected entities. Failure to comply will bring regulatory attention to the entity and criticism from shareholders and other stakeholders. Should industry professionals have an attitude that their firm can comply with the standard, then it is presumed that such attitudes will have a positive effect on the perception that the analytics applications required to comply will benefit the affected entity. Thus, the following hypothesis is proposed:

Hypothesis 6: Attitude towards IFRS 9 Compliance will positively affect Perceived Benefits of IFRS 9 Applications

2.8.7 Organisational Big Data Analytics Capabilities Measurement Scales

Akter et al. (2016) refer to three typologies of big data analytics capabilities which they subsequently use as lower-order constructs to measure for big data analytics capability. These typologies include management capability, technology capability and talent capability. Akter et al. (2016) reference Kiron, Prentice, and Ferguson (2014) when defining these typologies, with management capability referring to "analytics planning, sharing and co-ordination, investment, control on analytics as a whole" (Akter et al., 2016, p. 117). Technology capability refers to "organizational openness, compatibility, analytics technology, collaborative use of data (connectivity)" (Akter et al., 2016, p. 117) and talent capability referring to "analytical talent, technical and business knowledge, organization as a whole effective in disseminating insights" (Akter et al., 2016, p. 117).

In this study, organisational big data analytics capability is to be measured by three first-order constructs which are derived from the varied constructs employed by Akter et al. (2016) and Fosso et al. (2017). The first two first-order constructs, IFRS 9 analytics planning and IFRS 9 analytics governance, are derived from Akter et al.'s (2016) and Fosso et al.'s (2017) big data analytics management capabilities constructs. The

third first-order construct, IFRS analytics personnel capabilities, is derived from Akter et al.'s (2016) big data analytics talent capability construct and Fosso et al.'s (2017) big data analytics personnel expertise capability construct.

Akter et al. (2016) stated that "big data analytics capability was found to have a positive association with all the primary dimensions" (p. 124), being big data analytics management, technical and talent capabilities. Fosso et al. (2017) found a positive significant relationship between the second order big data analytics capabilities construct with the first-order constructs of big data analytics infrastructure, management and personnel expertise capability. Therefore, as this study adopts a variant of these constructs and their relationships, it is expected that the second order construct organisational big data analytics capabilities is a multidimensional construct and can be measured by the first-order constructs of IFRS 9 analytics planning, IFRS 9 analytics governance and IFRS 9 analytics personnel capabilities. As a result, the following hypothesis is proposed:

Hypothesis 7: Organisational big data analytics capabilities is a multi-dimensional construct and it will be measured by IFRS 9 analytics planning, IFRS 9 analytics governance and IFRS 9 analytics personnel capabilities.

2.8.8 System Quality Measurement Scales

Reliability has been proposed by Nelson et al. (2005) and other academics, such as Gable et al. (2008) and Hamilton and Chervany (1981) to measure DeLone and McLean's (2003) system quality construct. The reliability dimension refers to "the degree to which a system is dependable (e.g., technically available) over time" (Nelson et al., 2005, p. 206). Integration refers to "the degree to which a system facilitates the combination of information from various sources to support business decisions" (Nelson et al., 2005, p. 206). Like the reliability dimension, integration has been put forward by researchers as a viable measure of system quality (Nelson et al., 2005; Bailey and Pearson, 1983; Gable et al., 2008; Iivari, 2005; Sedera and Gable, 2004).

Big data characteristics is an addition to the measurement set for system quality and seeks to reflect upon the big data characteristics of the information systems under examination. This construct is motivated by Fosso et al.'s (2017) inclusion of the first-order construct big data analytics infrastructure capabilities to measure big data analytics capabilities and Fosso et al.'s (2015) systematic literature review of big data literature. However, as this study is complementing DeLone and McLean's (2003) information systems success model with the concept of organisational big data analytics capabilities, it seemed more plausible to measure the big data technical infrastructure qualities of the information systems in the system quality construct rather than the organisational big data analytics construct.

The constructs of reliability and integration have been confirmed by extant literature as valid measures for system quality (Nelson et al., 2005; Gable et al., 2008; Hamilton and Chervany, 1981; Bailey and Pearson, 1983; Iivari, 2005; Sedera and Gable, 2004). The measurement items comprising the introduced first-order construct of big data characteristics have been derived from a literature review on big data by Fosso et al. (2015) and its inclusion motivated by the construct of big data analytics infrastructure capabilities used by Fosso et al. (2017) to measure big data analytics capabilities. Consequently, it is hypothesised that system quality is a multi-dimensional construct and will be measured by the constructs of reliability, integration and big data characteristics. As such, the following hypothesis is proposed:

Hypothesis 8: System quality is a multi-dimensional construct and it will be measured by big data characteristics, reliability and integration.

2.8.9 Information Quality Measurement Scales

Extant literature has used the construct of accuracy to measure DeLone and McLean's (2003) information quality construct. Accuracy is defined as "the degree to which information is correct, unambiguous, meaningful, believable, and consistent" (Nelson et al., 2005, p. 204). Examples of studies which leverage the accuracy construct to measure information quality include Bailey and Pearson (1983), Gable et al. (2008), Iivari (2005) and Rainer and Watson (1995).

Past studies have also measured information quality with the use of the currency construct. Nelson et al. (2005) define currency as "the degree to which information is up-to-date, of the degree to which the information precisely reflects the current state of the world that it represents" (p. 204). Examples of studies which implement and test the concept of currency as a measure of information quality include those conducted by Bailey and Pearson (1983), Barki and Huff (1985), Cappiello, Francalanci, and Pernici (2003), Ives, Olson, and Baroudi (1983) and Miller and Doyle (1987).

The constructs of accuracy and currency have been leveraged and tested in extant literature as a means to measure the construct of information quality. Therefore, it is presumed that information quality is a multi-dimensional construct and can be measured by these two first-order constructs. Accordingly, the following hypothesis is proposed:

Hypothesis 9: Information quality is a multi-dimensional construct and it will be measured by currency and accuracy

2.8.10 Service Quality Measurement Scales

Service quality has been measured in previous research using the reliability construct. Reliability is defined as "the extent to which the IS department strives to improve the information services provided to users" (Gorla et al., 2010, p. 213). Reliability has been used to measure service quality in a number of previous studies, including by Gorla et al. (2010), Pitt, Watson, and Kavan (1995) and Parasuraman et al. (1991).

For the purpose of this study and to measure service quality, the reliability construct has been renamed to dependability in order to avoid confusion with the system quality's first-order construct also referred to as reliability. Another first-construct used to measure service quality is known as assurance, which Gorla et al. (2010) define as "the ability of the IS staff to build users' confidence" (p. 213). Like the construct of reliability, assurance has been used in previous studies to measure service quality (Gorla et al., 2010; Pitt et al., 1995; Parasuraman et al., 1991).

Extant literature has adopted the constructs of reliability and assurance to measure service quality. Therefore, it is assumed that service quality is a multi-dimensional construct and can be measured by reliability and assurance as second order constructs. Hence, the following hypothesis is proposed:

Hypothesis 10: Service quality is a multi-dimensional construct and it will be measured by dependability and assurance.

2.9 Conclusion

This chapter discussed both the literature and practical research problems this study seeks to address. Extant literature representing the IFRS, data governance and big data research fields were examined with themes identified as a result of a structured literature review process. The chapter also identified apparent gaps in extant literature before introducing the study's research models and hypotheses. This study seeks to answer six research questions and test their 10 corresponding hypotheses. Table 5 provides a summary of this study's research questions and hypotheses.

Table 5: Research Questions and Hypotheses Summary

Research Question	Research Hypothesis
Research Question 1: Do organisational big data analytics capabilities, system quality, information quality and service quality influence the intention to use IFRS 9 analytics applications and attitudes towards IFRS9 compliance?	**Hypothesis 1a:** Organisational Big Data Analytics Capabilities positively affect Intention to Use IFRS 9 Analytics Applications
	Hypothesis 1b: Organisational Big Data Analytics Capabilities positively affect Attitude towards IFRS 9 Compliance
	Hypothesis 2a: System Quality will positively affect Intention to Use IFRS 9 Analytics Applications
	Hypothesis 2b: System Quality will positively affect Attitude towards IFRS 9 Compliance
	Hypothesis 3a: Information Quality will positively affect Intention to Use IFRS 9 Analytics Applications
	Hypothesis 3b: Information Quality will positively affect Attitude towards IFRS 9 Compliance
	Hypothesis 4a: Service Quality will positively affect Intention to Use IFRS 9 Analytics Applications
	Hypothesis 4b: Service Quality will positively affect Attitude towards IFRS 9 Compliance
Research Question 2: Does intention to use IFRS 9 analytics applications and attitude towards IFRS 9 compliance influence perceived benefits of IFRS 9 applications?	**Hypothesis 5:** Intention to Use IFRS 9 Analytics Applications will positively affect Perceived Benefits of IFRS 9 Applications
	Hypothesis 6: Attitude towards IFRS 9 Compliance will positively affect Perceived Benefits of IFRS 9 Applications
Research Question 3: What constitutes valid and reliable scales for measuring organisational big data analytics capabilities?	**Hypothesis 7:** Organisational big data analytics capabilities is a multi-dimensional construct and it will be measured by IFRS 9 analytics planning, IFRS 9 analytics governance and IFRS 9 analytics personnel capabilities.
Research Question 4: What constitutes valid and reliable scales for measuring system quality?	**Hypothesis 8:** System quality is a multi-dimensional construct and it will be measured by big data characteristics, reliability and integration.
Research Question 5: What constitutes valid and reliable scales for measuring information quality?	**Hypothesis 9:** Information quality is a multi-dimensional construct and it will be measured by currency and accuracy
Research Question 6: What constitutes valid and reliable scales for measuring service quality?	**Hypothesis 10:** Service quality is a multi-dimensional construct and it will be measured by dependability and assurance.

Chapter 3: Research Methodology

3.1 Introduction

The purpose of this chapter is to outline the methodology employed by this research undertaking. Aspects discussed include the unit of analysis; data collection, sample size, pilot test, construct measures, data analysis methodology and ethical considerations.

3.2 Unit of Analysis

The unit of analysis for this research is industry professionals exposed to the implementation of IFRS 9 in affected entities. The term affected entities refers to entities that are required comply with IFRS 9. This occurs when entities or their subsidiaries operate in regulatory jurisdictions which have converged with IFRS. Industry professionals exposed to the implementation of IFRS 9 refers to individuals employed by or contracted to operate within affected entities. These individuals can be associated with the implementation of IFRS 9 in any number of ways, including through the development of credit risk models that enable their firm to comply with IFRS 9 requirements, deployment of the information systems capabilities that facilitate the use of IFRS 9 related applications or as primary users of the applications which interpret the output of the credit risk models.

For information systems success research, the concept of an information system is defined by Seddon (1997) as "either some aspect of an application of information technology (IT), one individual application, a group of applications (including those of an entire organization), or an application of one type of IT." (p. 246). Drawing upon Seddon's (1997) definition, the secondary unit of analysis for this study are the information systems used by industry professionals or leveraged by their entities which are affected by the requirements introduced by IFRS 9. The grouping of information systems together for information systems success research has been accomplished in extant literature, such as by Gorla et al. (2010) who for their study on the relationship between information quality, system quality and service quality on organizational impact had a unit of analysis of "one or more information systems engaged by a user" (p. 216).

3.3 Data Collection and Population Sample

A survey questionnaire was developed using Qualtrics (2017) and distributed to members of two IFRS 9 implementation LinkedIn community groups using LinkedIn connection invitations. The developed survey questionnaire can be found in Appendix B. LinkedIn groups were used in this study as they provide an international portal to industry professionals who specialise in certain fields, in this case, IFRS 9 implementation.

3.3.1 LinkedIn Groups

This section will outline the LinkedIn groups employed in this study. A LinkedIn group is defined as:

> "…a place for professionals in the same industry or with similar interests to share content, find answers, post and view jobs, make business contacts, and establish themselves as industry experts." (LinkedIn, 2017a).

This research undertaking leveraged two LinkedIn groups, known as the 'IFRS 9 Implementation Group' and the 'IFRS 9 and CECL Modelling' groups. Both groups are closed, meaning that a request to join the group must be submitted and approved by the group administrator (LinkedIn, 2017b). An summary of the two groups joined is provided in Table 6.

These groups were targeted because they act as a portal through which industry professionals working on IFRS 9 implementation projects in affected entities have come to share experiences and connect with peers who are sharing the experience. Furthermore, the fact that these LinkedIn groups are closed and require administrative authorisation to join suggests that the credibility and purpose of the group is somewhat protected. Hence, it can be assumed that members of these LinkedIn groups have some professional affiliation with IFRS 9.

Table 6: Summary of LinkedIn Groups Used as Population Sample

Group Name	Description	Members	Group URL
IFRS 9 Implementation Group	The purpose of the group is to discuss practical challenges of implementing IFRS 9 without touching on confidential and or sensitive information.	1,490	https://linkedin.com/groups/8191086
IFRS 9 and CECL Modelling	A LinkedIn group dedicated to the discussion of IFRS 9 / CECL modelling issues. For further resources (papers / glossary etc. check the website www.openriskmanual.org)	754	https://linkedin.com/groups/8540200

3.3.2 Survey Questionnaire Distribution

This section will discuss the survey questionnaire distribution method employed in this study. A request to join both of the IFRS 9 LinkedIn groups identified in Table 6 was sent by the author. Once the request had been approved, the list of group members was scraped into an Excel worksheet. LinkedIn displays a list of group members with a limit of ten per page, so a macro was employed to cycle through each of the combined 225 group pages exporting the contents to Excel. Once the group member lists were stored in Excel a VBA macro was used to delete the profile pictures and garbage text, leaving behind a list of group

members and their positions. Another VBA macro then converted the name of the group member, which was a hyperlink to their LinkedIn profile, into a plaintext URL of their LinkedIn profile.

The final worksheets consisted of three columns:

1) Group member's name

2) Group member's job description

3) Group member's LinkedIn plaintext profile URL

Members of the IFRS 9 LinkedIn groups were approached using the LinkedIn invitation to connect function. The process of inviting to connect with an individual on LinkedIn is described by the platform: "You can ask someone to join your professional network by sending them an invitation to connect. If they accept your invitation, they'll become a 1st-degree connection." (LinkedIn, 2017c).

LinkedIn allows users to "add a personalized message to the recipient to introduce yourself or add context to your relationship" (LinkedIn, 2017d), which is limited to 300 characters. The default questionnaire access URL generated by Qualtrics was 61 characters, 20.33% of the characters permitted in the connection invitation message. To address the constraint of a long survey access URL, the bit.ly (Bitly Inc, 2017) URL shortener service was used to reduce the character count of the survey access URL to 18 characters.

The final invitation message was exactly 300 characters and is as follows:

> Hello,
> I have requested to add you as I believe you are an expert in IFRS 9 implementation.
> I am conducting a postgraduate research survey on the standard, which will greatly benefit from your expertise.
> The survey takes approx. 10 mins and can be found here: http://bit.ly/ifrs9survey
> Thank you.

Another macro was developed which navigated to each group member's LinkedIn profile URL from the Excel worksheets in an internet browser. Once opened, the author clicked the LinkedIn connect button and continued the macro, which pasted the personalised invitation message into the relevant text field and submitted the invitation. This sent a connection invitation to the group member containing the message outlined above. A total of 2,192 connection invitations containing survey invitations were sent. This number does not equal the membership counts of the two LinkedIn groups as group members had opted to restrict the receivership of invitation requests from individuals who know their email address, an option available to LinkedIn users (LinkedIn, 2017e).

To increase the response rate, a follow-up email was sent to those who accepted the LinkedIn connection invitation request two weeks after acceptance. The email address of the group member was obtained through an export of the author's LinkedIn user data archive (LinkedIn, 2017f).

The contents of the follow-up email message is as follows:

> Hello,
>
> Thank you for recently accepting my LinkedIn invitation.
>
> The reason I requested to connect with you is because I believe you have experience in the implementation of IFRS 9.
>
> As mentioned in the invitation request, I am conducting a postgraduate research survey on the standard which will greatly benefit from your professional experience and expertise.
>
> It is hoped that the findings of this survey could help affected entities to improve their compliance processes post implementation as well as preparing their information systems for the implementation of future IFRS standards.
>
> The survey is entirely anonymous and takes approximately 10 minutes to complete.
>
> You can access the survey here: http://bit.ly/ifrs9survey
>
> Your contribution will greatly benefit the study of how IFRS 9 impacts affected entities.
>
> Thank you.
>
> Kind Regards,
>
> Connor Stead
>
> Master of Research Candidate
> Department of Accounting and Corporate Governance
> Faculty of Business and Economics
> Macquarie University
> Sydney, Australia

3.3.3 Survey Questionnaire Responses

2,192 group members were sent survey questionnaire invitations through the LinkedIn connection request function. Of this number, 936 (42.70%) accepted the request to connect and subsequently became first-degree connections with the author. Accepting the LinkedIn invitation to connect does not imply that the group member accessed the survey. This is highlighted by the bit.ly (Bitly Inc, 2017) hyperlink insights, which suggest that the survey questionnaire access link was clicked on 718 times, a

click rate of 32.76%. There were 113 responses received through Qualtrics (2017), equating in a response rate of 5.16%. The final response count exceeds the 30 – 100 recommendation for Structural Equational Modelling Partial Least Square analysis (Hair et al., 2014).

3.4 Construct Measurement Items and Measurement Model

The measurement items of constructs selected for use in this research is outlined in Table 7. To measure each item a seven-point Likert-type scale was implemented. This scale included the following seven points:

1. Strongly Disagree
2. Disagree
3. Somewhat Disagree
4. Neutral
5. Somewhat Agree
6. Agree
7. Strongly Agree

Table 7 also identifies where the measurement items have been adapted from extant literature. This study's measurement research model is in Figure 10, which illustrates the relationship between the measurement items and the structural model constructs.

Table 7: Construct Measurement Items

Secord Order Construct: System Quality

First Order Construct	Item Code	Question/Statement	Adapted From
Reliability	RELI1	In my organisation, the information system (IS) operates reliably.	Nelson et al. (2005)
Reliability	RELI2	In my organisation, the IS performs reliably.	Nelson et al. (2005)
Reliability	RELI3	In my organisation, the operation of the IS is dependable.	Nelson et al. (2005)
Integration	INTE1	In my organisation, the Information System (IS) effectively integrates data from different areas of the organisation.	Nelson et al. (2005)
Integration	INTE2	In my organisation, the Information System (IS) is capable of pulling together information from different places in the organisation.	Nelson et al. (2005)
Integration	INTE3	In my organisation, the Information System (IS) effectively combines data from different areas of the organisation.	Nelson et al. (2005)
Big Data Characteristics	BDATA1	In my organisation, the IS can handle large volumes of data that consumes large amounts of storage and/or consists of a large number of records.	Fosso et al. (2015)
Big Data Characteristics	BDATA2	In my organisation, the IS can integrate data generated from a variety of internal and/or external sources existing in a range of different formats.	Fosso et al. (2015)
Big Data Characteristics	BDATA3	In my organisation, the IS can accommodate data generated and/or captured at high velocity (frequency or speed).	Fosso et al. (2015)
Big Data Characteristics	BDATA4	In my organisation, the IS can address the inherent unpredictability of data to gain reliable predictions (veracity).	Fosso et al. (2015)
Big Data Characteristics	BDATA5	In my organisation, the IS can generate economically worthy insights and benefits (value) through data extraction and transformation.	Fosso et al. (2015)
System Quality Overall	SYSQ1	Overall, the IS of my organisation is rated highly.	Nelson et al. (2005)
System Quality Overall	SYSQ2	Overall, the IS of my organisation is of high quality.	Nelson et al. (2005)
System Quality Overall	SYSQ3	Overall, the IS of my organisation would be given a high rating.	Nelson et al. (2005)

Second Order Construct: Information Quality

First Order Construct	Item Code	Question/Statement	Adapted From
Currency	CURR1	In my organisation, the output produced by the IS for IFRS 9 reporting is the most recent.	Nelson et al. (2005)
Currency	CURR2	In my organisation, the output produced by the IS for IFRS 9 reporting is the most current.	Nelson et al. (2005)
Currency	CURR3	In my organisation, the output produced by the IS for IFRS 9 reporting is always up to date.	Nelson et al. (2005)
Accuracy	ACCU1	In my organisation, the output produced by the IS for IFRS 9 reporting is complete.	Nelson et al. (2005)
Accuracy	ACCU2	In my organisation, the output produced by the IS for IFRS 9 reporting is contains no errors.	Nelson et al. (2005)
Accuracy	ACCU3	In my organisation, the output produced by the IS for IFRS 9 reporting is accurate.	Nelson et al. (2005
Information Quality Overall	INFOQ1	Overall, in my organisation the output produced by the IS for IFRS 9 reporting is rated highly.	Nelson et al. (2005)
Information Quality Overall	INFOQ2	Overall, in my organisation the output produced by the IS for IFRS 9 reporting is of high quality.	Nelson et al. (2005)
Information Quality Overall	INFOQ3	Overall, in my organisation the output produced by the IS for IFRS 9 reporting would be given a high rating.	Nelson et al. (2005)

Secord Order Construct: Service Quality

First Order Construct	Item Code	Question/Statement	Adapted From
Dependability	DPND1	When the IT Support Team promises to do something by a certain time, they do so.	Parasuraman et al. (1991) Gorla et al. (2010)
Dependability	DPND2	When departments within the organisation encounter a problem, the IT Support Team shows a sincere interest in solving it.	Parasuraman et al. (1991) Gorla et al. (2010)
Dependability	DPND3	The IT Support Team insists on error-free records.	Parasuraman et al. (1991) Gorla et al. (2010)
Assurance	ASSU1	The behaviour of the IT Support Team instills confidence in employees of other departments.	Parasuraman et al. (1991) Gorla et al. (2010)
Assurance	ASSU2	Users feel safe in their transactions with the IT Support Team.	Parasuraman et al. (1991) Gorla et al. (2010)
Assurance	ASSU3	IT Support Team have the knowledge required to do their jobs well.	Parasuraman et al. (1991) Gorla et al. (2010)
Service Quality Overall	SERVQ1	Overall, in my organisation the IT Support Team is rated highly.	Nelson et al. (2005)
Service Quality Overall	SERVQ2	Overall, in my organisation the IT Support Team is of high quality.	Nelson et al. (2005)
Service Quality Overall	SERVQ3	Overall, in my organisation the IT Support Team would be given a high rating.	Nelson et al. (2005)

Secord Order Construct: Organisational Big Data Analytics Capabilities

First Order Construct	Item Code	Question/Statement	Adapted From
IFRS 9 Analytics Planning	IFRS9PLAN1	My organisation continuously examines innovative opportunities for the strategic use of IFRS 9 analytics.	Akter et al. (2016) Fosso et al. (2017)
IFRS 9 Analytics Planning	IFRS9PLAN2	My organisation enforces adequate plans for the utilization of IFRS 9 analytics.	Akter et al. (2016) Fosso et al. (2017)
IFRS 9 Analytics Planning	IFRS9PLAN3	My organisation performs IFRS 9 analytics planning processes in systematic ways.	Akter et al. (2016) Fosso et al. (2017)
IFRS 9 Analytics Planning	IFRS9PLAN4	My organisation frequently adjusts IFRS 9 analytics plans to better adapt to changing conditions.	Akter et al. (2016) Fosso et al. (2017)
IFRS 9 Analytics Governance	IFRS9GOVN1	In my organisation, the responsibility for IFRS 9 analytics development is clear.	Akter et al. (2016) Fosso et al. (2017)
IFRS 9 Analytics Governance	IFRS9GOVN2	In my organisation, IFRS 9 analytics project proposals are properly appraised.	Akter et al. (2016) Fosso et al. (2017)
IFRS 9 Analytics Governance	IFRS9GOVN3	In my organisation, the performance of the IFRS 9 analytics function is constantly monitored.	Akter et al. (2016) Fosso et al. (2017)
IFRS 9 Analytics Governance	IFRS9GOVN4	In my organisation, the IFRS 9 analytics personnel are clear about their job description and key performance criteria.	Akter et al. (2016) Fosso et al. (2017)
IFRS 9 Analytics Personnel	IFRS9PERS1	My organisation's IFRS 9 analytics personnel show superior understanding of technological trends.	Akter et al. (2016) Fosso et al. (2017)
IFRS 9 Analytics Personnel	IFRS9PERS2	My organisation's IFRS 9 analytics personnel show superior ability to learn new technologies.	Akter et al. (2016) Fosso et al. (2017)
IFRS 9 Analytics Personnel	IFRS9PERS3	My organisation's IFRS 9 analytics personnel are very knowledgeable about the role of IFRS analytics as a means, not an end.	Akter et al. (2016) Fosso et al. (2017)
Organisational Big Data Analytics Capabilities	IFRS9BDA1	Overall, my organisation's big data and analytics capabilities is rated highly.	Nelson et al. (2005)
Organisational Big Data Analytics Capabilities	IFRS9BDA2	Overall, my organisation's big data and analytics capabilities is of high quality.	Nelson et al. (2005)
Organisational Big Data Analytics Capabilities	IFRS9BDA3	Overall, my organisation's big data and analytics capabilities would be given a high rating.	Nelson et al. (2005)

First Order Construct: Intention to Use IFRS 9 Analytics Applications

Item Code	Question/Statement	Adapted From
INFRS9INTU1	For IFRS 9 requirements my organisation intends to use IFRS 9 Applications consistently.	Almutairi and Subramanian (2005) Iivari (2005)
INFRS9INTU2	For IFRS 9 requirements my organisation intends to use IFRS 9 Applications frequently.	Almutairi and Subramanian (2005) Iivari (2005)
INFRS9INTU3	For IFRS 9 requirements my organisation intends to use IFRS 9 Applications constantly.	Almutairi and Subramanian (2005) Iivari (2005)
INFRS9INTU4	For IFRS 9 requirements my organisation intends to use IFRS 9 Applications regularly.	Almutairi and Subramanian (2005) Iivari (2005)

First Order Construct: Attitude Towards IFRS 9 Compliance

Item Code	Question/Statement	Adapted From
IFRS9COMP1	My organisation is on track to meet the IFRS 9 compliance deadline.	Self-Developed Construct, motivated by: Birindeli and Ferretti (2008) Alexander et al. (2013) Jermakowicz and Gornik-Tomaszewski (2006)
IFRS9COMP2	My organisation has a high chance of meeting the IFRS 9 compliance deadline.	
IFRS9COMP3	My organisation is on track to meet all the IFRS 9 compliance requirements.	
IFRS9COMP4	My organisation has a high chance of meeting all the IFRS 9 compliance requirements.	

First Order Construct: Perceived Benefits of IFRS 9 Applications

Item Code	Question/Statement	Adapted From
BENEFIT1	In my organisation, IFRS 9 Applications help to ensure high efficiency in risk decision making processes.	Mahmood and Soon (1991) Gorla et al. (2010)
BENEFIT2	In my organisation, IFRS 9 Applications help to ensure good co-ordination amongst functional areas.	Mahmood and Soon (1991) Gorla et al. (2010)
BENEFIT3	In my organisation, IFRS 9 Applications help to maximise profit margins.	Mahmood and Soon (1991) Gorla et al. (2010)
BENEFIT4	In my organisation, IFRS 9 Applications help to maximise market share.	Mahmood and Soon (1991) Gorla et al. (2010)
BENEFIT5	In my organisation, IFRS 9 Applications help to maximise strategic planning efficiency.	Mahmood and Soon (1991) Gorla et al. (2010)

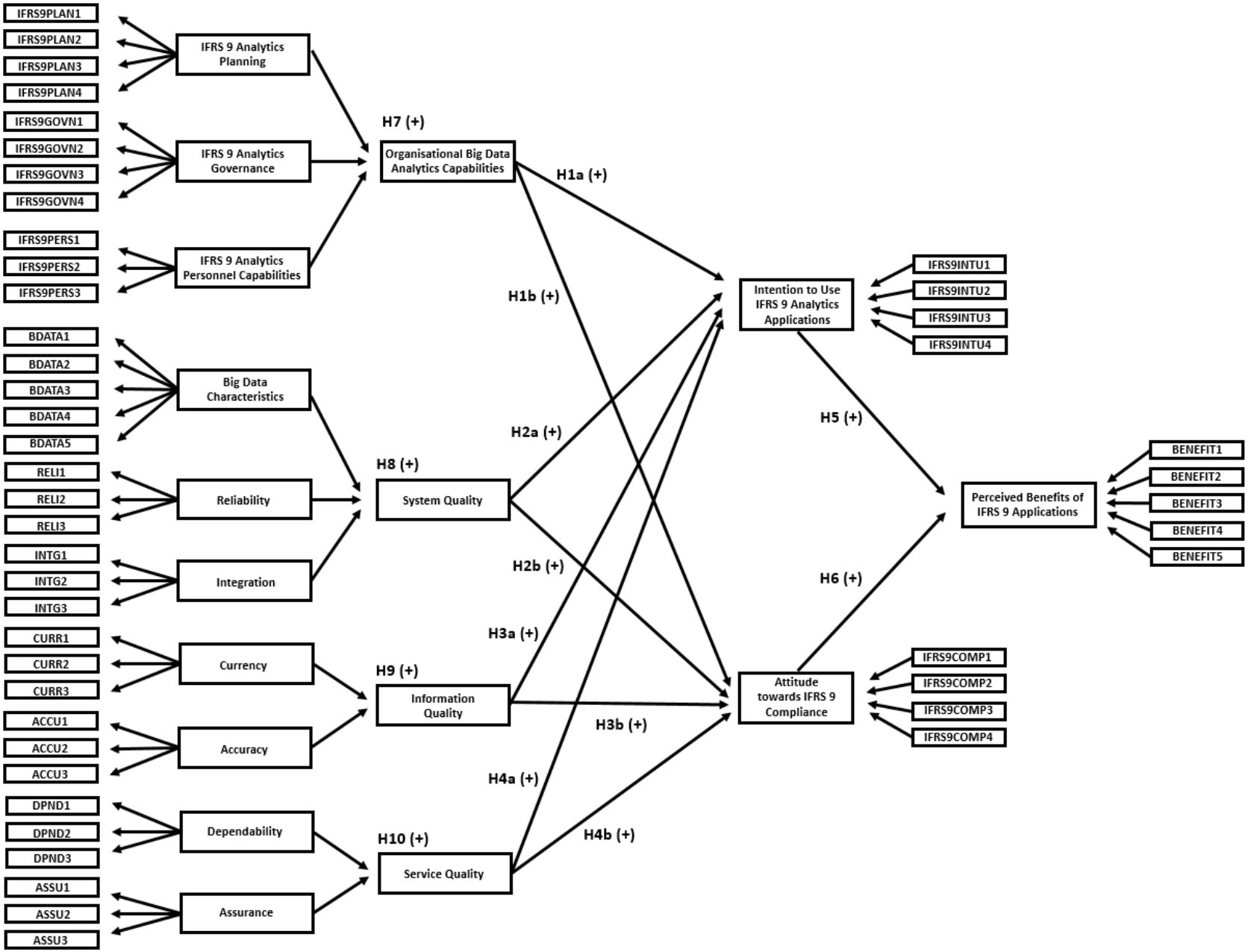


Figure 10: Research Measurement Model

3.5 Pilot Test

To ensure the reliability and validity of the survey questionnaire instrument a pilot test was conducted. Due to inaccessibility to the sample population, final year accounting Master of Research students were approached to participate. There were 6 complete pilot survey responses received. The primary outcome of this pilot test was the determination that formatting and question structure had to be improved. There were grammatical errors in the questions and pilot respondents accessing the survey on mobile devices encountered problems. The pilot responses were also leveraged to test the concept introduced to the model, attitudes towards IFRS 9 compliance. Pilot respondents found the measurement items well worded and reflected the concept under examination.

3.6 Data Analysis

This section will introduce the statistical methodology employed by this study, structural equational modelling partial least squares (SEM-PLS). This statistical approach will be adopted to test the hypothesis and research models identified in Chapter 2.

3.6.1 Structural Equational Modelling

Kline (2011) explains that SEM is not one type of statistical analysis, but rather a group of related techniques. The purpose of SEM is to determine if the collected data supports the structural model (Kline, 2011). If it is determined that the collected data supports the structural model, then it is possible to devise more complex theoretical models as a result (Schumacker and Lomax, 2004). However, if the collected data does not support the theoretical models, then the theoretical model must be revised, modified and retested or another model developed (Schumacker and Lomax, 2004).

Schumacker and Lomax (2004) specify four key reasons why SEM is popular amongst researchers. Firstly, SEM "permits complex phenomena to be statistically modelled and tested" (p. 7), due to its ability to accommodate large numbers of variables. Secondly, Schumacker and Lomax (2004) note that measurement error has caused problems in many disciplines. To counter such concerns SEM "techniques explicitly take measurement error into account when statistically examining the data" (p. 7). Thirdly, SEM techniques have matured and it is possible to combine multiple SEM techniques using multilevel SEM models (Schumacker and Lomax, 2004). Finally, Schumacker and Lomax (2004) note the increasingly user-friendly nature of SEM software applications maturing from complex programming to graphical user interfaces.

3.6.2 Structural Equational Modelling Partial Least Squares

There are two approaches for SEM, Covariance Based (CB) SEM and SEM-PLS (Hair et al., 2010). Chin and Newsted (1999) compare CB-SEM and SEM-PLS, identifying several differences between the two approaches. They describe CB-SEM as a parameter orientated covariance based approach which assumes

typically multivariate normal distribution and independent observations. This is contrasted with SEM-PLS, which Chin and Newsted (1999) describe as being a prediction orientated variance-based approach that assumes predictor specification. In other words, SEM-PLS is nonparametric.

Unlike CB-SEM, SEM-PLS does not require multivariate distribution and independent observations (Chin and Newsted, 1999). Vatanasakdakul (2007) suggests that CB-SEM is designed to obtain the goodness-of-fit, whereas SEM-PLS is used to maximise prediction. This is also pointed out by Chin and Newsted (1999), who describe CB-SEM as optimal for parameter accuracy testing whereas SEM-PLS optimal for prediction accuracy testing. Another key differentiation is that of required sample sizes. Chin and Newsted (1999) suggest that for CB-SEM minimum recommended samples sizes range between 200 and 800 samples, whereas minimal sample sizes for SEM-PLS range between 30 and 100 samples.

Hair et al. (2014) note that SEM-PLS operates efficiently with small sample sizes and can handle both reflective and formative measurement models. The complexity of the structural model has little influence on the sample size required for SEM-PLS (Hair et al., 2014). The results of a study conducted by Reinartz, Haenlein, and Henseler (2009) suggest that the use of SEM-PLS is ideal when dealing with small sample sizes.

3.6.3 Hierarchical Component Modelling

Some constructs are difficult and complex to measure directly. To study complex constructs, researchers can adopt proxy constructs to study the primary construct through abstraction. Hair et al. (2014) refer to this practice as forming “higher-order models or hierarchical component models” (p. 229). In these models, higher-order components capture the more abstract entity, and the lower-order components capture subdimensions of the abstract entity (Hair et al., 2014, p. 230). Vatanasakdakul (2007) refers to the implementation of hierarchical component models as an advanced form of structural modelling.

Lower-order components or first-order factors can be modelled with molar and molecular approaches (Chin and Gopal, 1995). The molar approach “connects the individual beliefs with other constructs in the model” (Chin and Gopal, 1995, p. 49). The second-order factor is an “emergent construct that is formed from the first order factors” (p. 49). In contrast, each first-order factor in the molecular approach “represents a separate attitudinal dimension which reflects an existing overall attitude” (p. 49). Figures 11 and 12 depict the molar and molecular approaches.

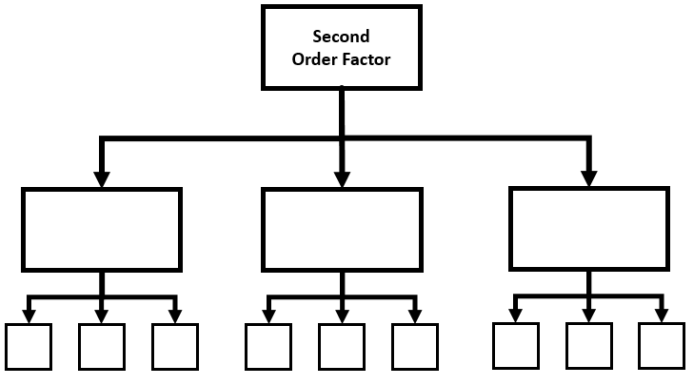


Figure 11: Molar Approach to Hierarchical Component Modelling (Chin and Gopal, 1995)

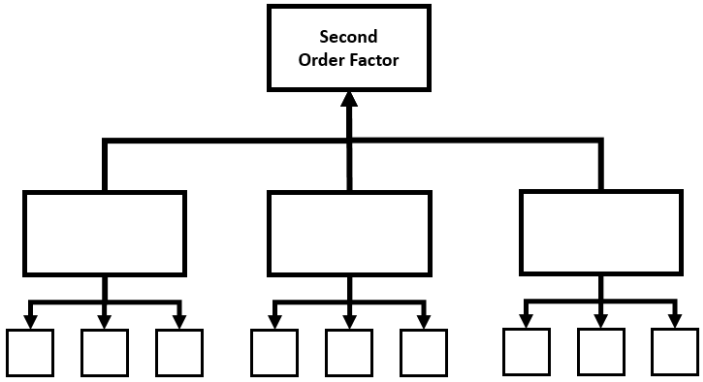


Figure 12: Molecular Approach to Hierarchical Component Modelling (Chin and Gopal, 1995)

In this study, first and second order constructs are employed for the constructs organisational big data capabilities; system quality, information quality and service quality. The reason first and second order constructs are utilised in this manner is because these particular concepts are complex in nature and cannot be directly measured. Hair et al. (2014) encourage the use of higher-order constructs for this reason.

3.6.4 Structural Equational Modelling Minimum Sample Size

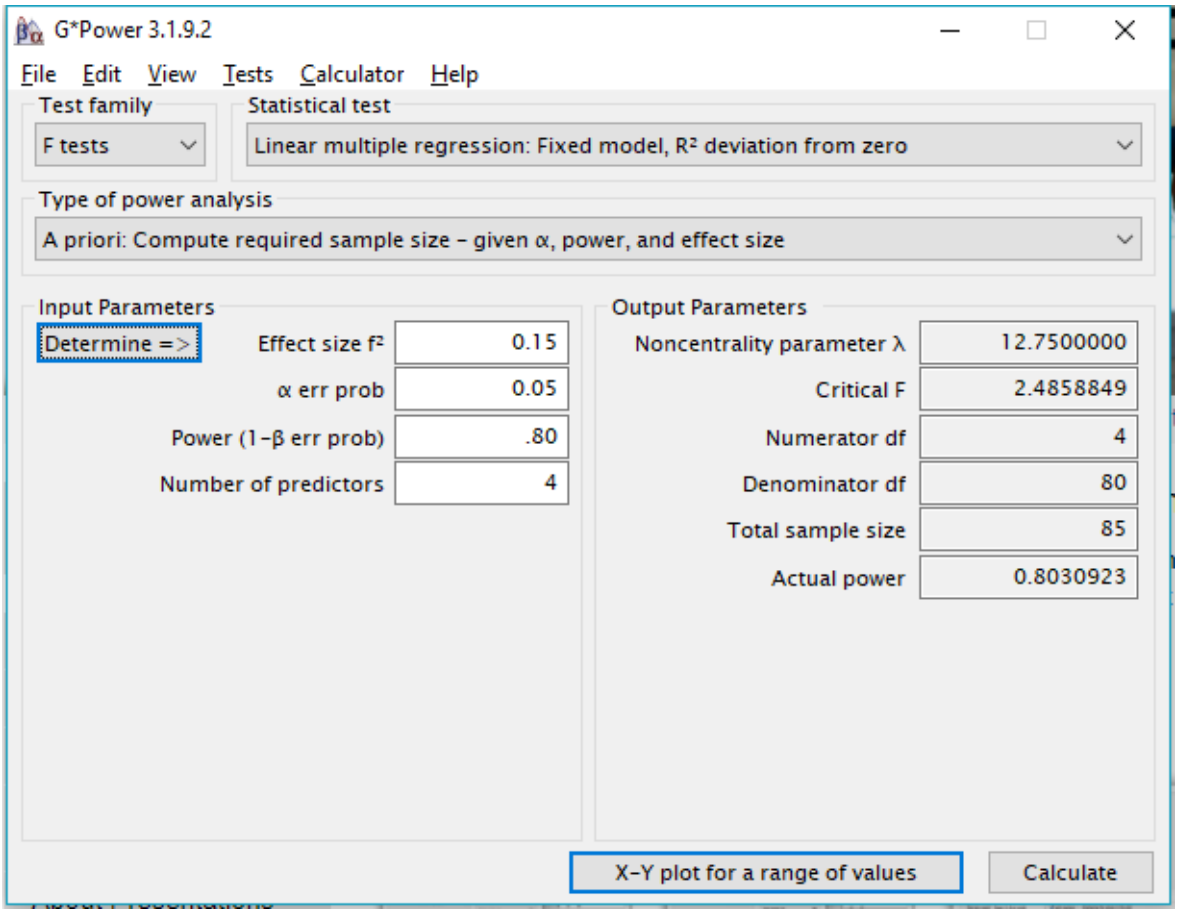
As previously mentioned, one of the benefits of SEM-PLS is that it can handle small sample sizes of non-normally distributed data (Hair et al., 2014). There is, however, some disagreement on how the minimum required sample sizes are determined. Some researchers encourage the use of the 10 times rule, which suggests sample sizes should be either "10 times the largest number of formative indicators used to measure a single construct" (Hair et al., 2014, p. 20) or "10 times the largest number of structural paths directed at a particular construct in the structural model" (Hair et al., 2014, p. 20).

Hair et al. (2014) recommend the use of other methods to determine minimum sample sizes for SEM-PLS such as Cohen's (1992) statistical power analysis for multiple regression models. This method uses the maximum number of arrows pointing at a construct as a key determinant, which for this research model

is 4. For a maximum of 4 arrows pointing to a particular construct, Cohen (1992) asserts that the minimum sample size required to detect R^2 values of 0.25 with a significance level of 0.01 at a statistical power of 80% is 91.

Another method recommended by Hair et al. (2014) for determining the minimum sample size required for SEM-PLS is the use of G*Power (Faul, Erdfelder, Lang, and Buchner, 2007), a computer application for model specific power analysis. Ringle, Da Silva, and Bido (2014) recommend that G*Power is to be used with the settings identified in Figure 13. For input parameters, Ringle et al. (2014) refer to Cohen (1988) and Hair et al.'s (2014) recommendations of an effect size f^2 value of 0.15 and a power (1 – β err prob) of 0.80. Ringle et al. (2014) also recommend an α error probability of 0.05 and for the number of predictors to equal the maximum number of arrows pointing at a construct, which in this study's structural model is 4. Using these settings and input parameters, G*Power recommends a total sample size of 85.

Figure 13: G*Power Settings, Input Parameters and Output Parameters



3.7 Ethical Considerations

The National Statement on Ethical Conduct in Human Research (Australian Research Council, 2007) asserts:

> "A judgement that a human research proposal meets the requirements of this National Statement and is ethically acceptable must be made before research can begin and before full funding for the proposal is released." (p. 7).

In accordance with the requirements outlined in the National Statement on Ethical Conduct in Human Research (Australian Research Council, 2007), ethics approval was sought from the Macquarie University Human Research Ethics Committee. The ethics approval application was approved on July 5, 2017 with approval reference number 5201700639.

A copy of the ethics approval is in Appendix C.

3.8 R Software Environment for Statistical Computing and Graphics

R (R Core Team, 2017) is a statistical computing programming environment for data analysis (The R Foundation, 2017). It is based upon the S programming language developed John Chambers and his colleagues while employed at Bell Laboratories (The R Foundation, 2017; Everitt and Hothorn, 2006). R is heavily influenced by the open source idea (Everitt and Hothorn, 2006) and is currently available as freeware under the GNU general public licence of the Free Software Foundation (The R Foundation, 2017). The environment is widely used for teaching statistics to undergraduate and graduate students at universities and colleges worldwide because of its ease of use and availability as freeware (Everitt and Hothorn, 2006).

The functionality of the default R environment can be extended through the use of packages. R is used in this research endeavour to calculate descriptive statistics of the collected data. Free and open access to powerful statistical analysis is essential for the increased future adoption and use of statistical analysis in future research endeavours particularly in regions of the world where access to powerful computing technologies and licenses for expensive statistical software is limited.

3.9 SmartPLS Partial Least Square Path Modelling Software

SmartPLS (Ringle, Wende, and Becker, 2015) is "a software application for the design of structural equation models on a graphical user interface" (Hansmann and Ringle, 2004). It is a java based application which is available for installation on both Microsoft Windows and Apple Macintosh operating systems. SmartPLS was developed at the University of Hamburg (Hansmann and Ringle, 2004).

The software analyses raw data input of the indicator variables and allows the model to be specified through an intuitive drag and drop feature, in which the user positions and connects latent variables using

a graphical interface (Temme, Kreis, and Hildebrandt, 2010). SmartPLS provides the output of calculations in several formats, including Microsoft Excel, R script, HTML and Latex. Hair et al. (2014) recommend the use of SmartPLS version 3 to conduct SEM-PLS analysis.

Chapter 4: Results

4.1 Introduction

This chapter will outline the empirical results of this research undertaking. It seeks to communicate the descriptive statistics of the sample, followed by a SEM-PLS analysis of both the measurement and structural models.

4.2 Descriptive Statistics

The first section of the survey instrument acquired descriptive statistical information about respondents. Table 8 summarises a proportion of the descriptive results and Appendix H provides charts of the key descriptive results. These charts were developed using the R package 'ggplot2' (Wickham and Chang, 2016), with the corresponding R console log located in Appendix J.

A majority of the participants were male (88.24%), with a small percentage female (17.76%) and none selecting 'other'. Most participants (74.77%) had a postgraduate degree (either at the Masters or PhD level), with 14.95% having an undergraduate degree (such as a Bachelor's degree), 3.74% held a college diploma or certificate, and the remaining 6.54% indicated having been educated at another level. 47.66% of the respondents had been with their organisation for 5 years or less, with 25.23% with the organisation for 5 to 10 years, 14.02% for 11 to 15 years and 13.08% for 16 years or more. Most respondents (57.01%) had spent 5 years or less working with IFRS, with 14.02% having 6 to 10 years' experience, 22.42% having 11 to 15 years' experience and 6.54% having 16 years or more.

Participants were asked to identify two countries in the survey instrument, which country they are located and in which country their organisations head office is located. There were 40 distinct countries for locations of the respondents. The United Kingdom was the highest identified country with 10.28% of respondents. France and the United States of America were the second highest selected with 8.41% of respondents respectively. A full list of the 40 distinct respondent location countries along with their frequencies is located in Appendix F**.**

There were 39 distinct countries selected for the location of the respondent's organisations head office. Again, the United Kingdom was the highest selected country with 11.21% of the responses. France was the second highest with 5.61%, with South Africa and the United Arab Emirates having 4.67% respectively. A complete list of the 39 distinct organisation head office location countries along with their frequencies is in Appendix F. Figures 14 and 15 summarise the respondent location and respondent's entity head office locations on world maps. These maps were produced using the R package 'maptools' (Bivand, 2017) and the corresponding R console log is located in Appendix N.

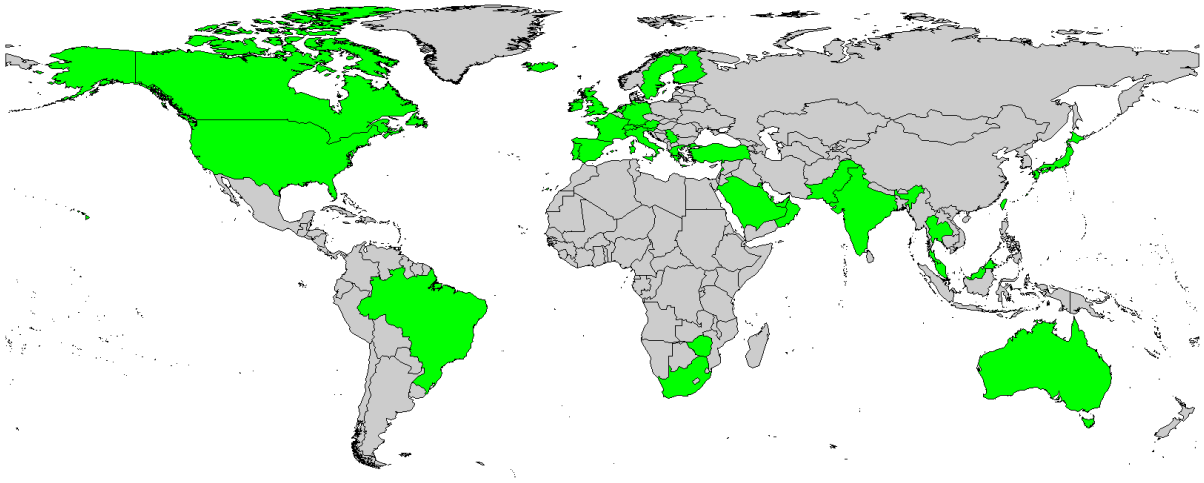


Figure 14: Respondent Location Country Map

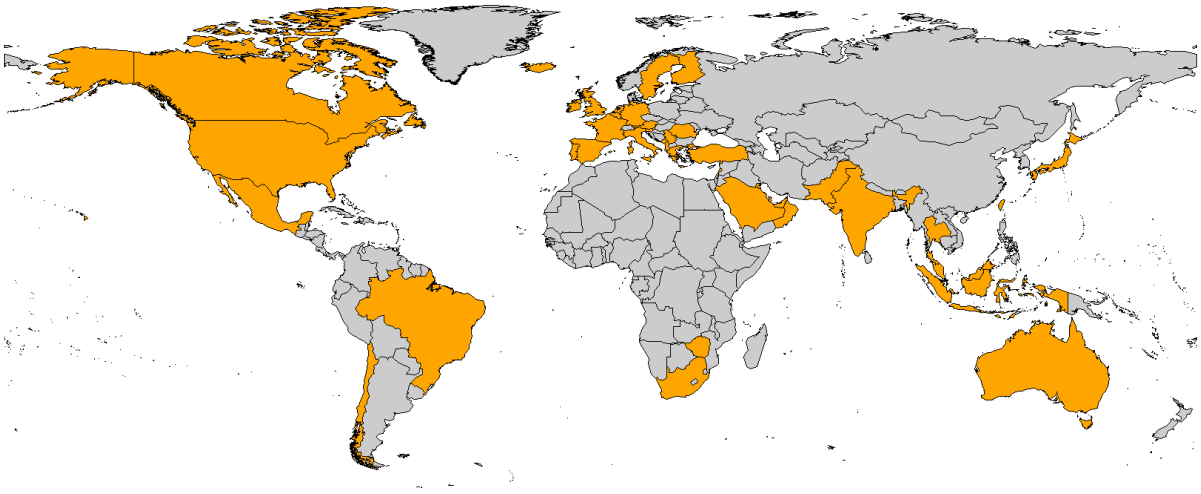


Figure 15: Respondent Head Office Location Country Map

Participants were asked to provide descriptive information on their organisations including the number of employees and which industry sector they operate. Most organisations (81.31%) employed 500 people or more. Organisations of 250 to 499 employees were identified by 6.54%, with 7.47% selecting organisations employing 50 to 249 employees and 4.67% and selecting organisations employing 1 to 49 individuals. The majority of organisations belonged to the banking sector (72.90%), 6.54% of organisations were in the software and services sector and 5.61% were commercial and professional services organisations. Small numbers of respondents selected other sectors, such as 1.87% in the insurance and technology, hardware and equipment sectors and 0.93% in the automobiles and components, diversified financials and telecommunication services sectors respectively. 8.41% of respondents placed their organisation in an unlisted sector.

Participants were also asked to identify which IFRS 9 technology solution vendors were involved with their organisation's IFRS 9 implementation projects. The list of vendors was sourced from the Chartis Research (2016, p. 6) IFRS 9 technology solutions report. SAS was the highest selected vendor (46.73%), with 31.76% selecting Oracle and 30.84% selecting Moody's Analytics. SAP was selected by 18.69% of respondents, with 10.28% selecting Misys and 8.41% selecting FIS. AxiomSL (6.54%), Wolters Kluwer FS (5.61%), Prometeia (4.67%) and Fernbach (2.80%) were also selected by respondents. 37.38% of respondents selected 'Other', potentially indicating a problem with the list compiled by Chartis Research (2016) or a rise in smaller IFRS 9 technology solution providers since the report was published. There were 4 (3.74%) non-responses for this question.

Table 8: Descriptive Statistics

	n	Frequency (%)
Gender		
Female	19	17.76
Male	88	82.24
Education		
Postgraduate degree (Master/Ph.D.)	80	74.77
Undergraduate degree	16	14.95
College diploma/certificate	4	3.74
Other	7	6.54
Years with Organisation		
0 - 5 years	51	47.66
6 - 10 years	27	25.23
11 - 15 years	15	14.02
16 years or more	14	13.08
Years With IFRS		
0 - 5 years	61	57.01
6 - 10 years	15	14.02
11 - 15 years	24	22.43
16 years or more	7	6.54
Number of Employees in Organisation		
1 – 49 people	5	4.67
50 – 249 people	8	7.48
250 - 499 people	7	6.54
500 people or more	87	81.31
Industry Sector		
Banks	78	72.90
Other	9	8.41
Software & Services	7	6.54
Commercial & Professional Services	6	5.61

	n	Frequency (%)
Insurance	2	1.87
Technology Hardware & Equipment	2	1.87
Automobiles & Components	1	0.93
Diversified Financials	1	0.93
Telecommunication Services	1	0.93

Vendors

SAS	50	46.73
Other	40	37.38
Oracle	34	31.78
Moody's Analytics	33	30.84
SAP	20	18.69
Misys	11	10.28
FIS	9	8.41
AxiomSL	7	6.54
Wolters Kluwer FS	6	5.61
Prometeia	5	4.67
Fernbach	3	2.80
No Response	4	3.74

Participants were asked which job position they hold, resulting in 93 unique responses. Due to this large number, each position was manually allocated into categories relevant to the study of IFRS 9: Risk, Finance, Information Technology (IT), Audit, Consultant and Management. Some positions did not fit into these categories and as such were categorised into 'Other'. These categories were inspired by the industry analysis which makes mention of the increasing emphasis on the relationship between risk, finance and IT departments due to regulatory standards such as IFRS 9 (European Banking Authority, 2016). The position with the highest response rate was Risk Analyst (3.74%), with Senior Consultant and Manager also both high at 3%. Post categorisation it was determined that most respondent's positions fell into the Finance category (22.43%). This was closely followed by Management (20.56%), Risk (16.82%) and Consultant (14.02%). Audit (3.74%) and Information Technology (3.74%) were the lowest and 5.61% were categorised as Other. Table 9 summarises the job position categories and Table 10 summarises the unique job position responses. The R console log for the job position category and unique job position responses frequency calculations can be found in Appendix M.

Table 9: Respondent Job Position Category Summary

Category	n	Frequency (%)
Finance	24	25.81
Management	22	23.65
Risk	18	19.35
Consultant	15	16.13
Other	6	6.45
Audit	4	4.30
Information Technology	4	4.30

Table 10: Unique Respondent Job Title Summary

Job Title	Category	n	Frequency (%)
Risk Analyst	Risk	4	3.74
Senior Consultant	Consultant	3	2.80
Manager	Management	3	2.80
Consultant	Consultant	2	1.87
Executive Director	Management	2	1.87
Project Manager	Management	2	1.87
Senior Manager	Management	2	1.87
Chief Risk Officer	Risk	2	1.87
Impairment Officer	Risk	2	1.87
Risk Manager	Risk	2	1.87
Audit Manager	Audit	1	0.93
Audit Supervisor	Audit	1	0.93
Compliance officer	Audit	1	0.93
External Auditor	Audit	1	0.93
Consultant or Business Analyst	Consultant	1	0.93
Consultant Risk Management	Consultant	1	0.93
Consulting Technical Director	Consultant	1	0.93
Financial Accounting and Advisory Senior Consultant	Consultant	1	0.93
Financial Risk Management Consultant	Consultant	1	0.93
IFRS Consultant	Consultant	1	0.93
Lead Consultant	Consultant	1	0.93
Management Consultant and Software Consultant	Consultant	1	0.93
Project Consultant	Consultant	1	0.93
Senior Consultant Risk Advisory	Consultant	1	0.93
Senior Consultant Risk Domain Expert	Consultant	1	0.93
Senior Risk Consultant	Consultant	1	0.93
Strategy Consultant	Consultant	1	0.93
Accountant	Finance	1	0.93
Accountant IFRS Technical Team Lead	Finance	1	0.93
Accounting Audit	Finance	1	0.93
Accounting Director	Finance	1	0.93
Assistant Manager Finance	Finance	1	0.93
CFO	Finance	1	0.93

Job Title	Category	n	Frequency (%)
Chief Manager Finance	Finance	1	0.93
Finance Executive Officer	Finance	1	0.93
Financial Controller	Finance	1	0.93
Group Senior Accountant Treasury and Investment Accounting	Finance	1	0.93
Head Financial Control and Treasury	Finance	1	0.93
Head of Accounting and Controlling Division	Finance	1	0.93
IFRS Accounting Coordinator	Finance	1	0.93
IFRS Analyst	Finance	1	0.93
IFRS Nine Analyst	Finance	1	0.93
IFRS Specialist	Finance	1	0.93
Senior Annual Financial Statement Drafting Specialist	Finance	1	0.93
Senior Expert Account Policy	Finance	1	0.93
Senior Finance Manager	Finance	1	0.93
Senior Financial Accountant	Finance	1	0.93
Senior Manager Balance Sheet Management	Finance	1	0.93
Statutory Reporting	Finance	1	0.93
Supervisory and Regulatory Financial Projects Senior Analyst	Finance	1	0.93
Valuations and Financial Modelling Specialist	Finance	1	0.93
Director of Technology Risk	IT	1	0.93
Head of Risk Finance and Data Quality IT Solutions	IT	1	0.93
Head of Risk IT	IT	1	0.93
Test Manager	IT	1	0.93
Assistant Manager	Management	1	0.93
Assistant Vice President	Management	1	0.93
Associate Vice President	Management	1	0.93
Chief Operations Officer	Management	1	0.93
Director	Management	1	0.93
Director Advanced Analytics	Management	1	0.93
Director Advisory Services	Management	1	0.93
Director Consulting	Management	1	0.93
Director Product Control	Management	1	0.93
Executive Vice President	Management	1	0.93
Innovation officer	Management	1	0.93
Manager IFRS Nine Programme	Management	1	0.93
Product Officer	Management	1	0.93
Programme Director	Management	1	0.93
Sales Manager	Management	1	0.93
Senior Advisor	Management	1	0.93
Senior Manager Analytics	Management	1	0.93
Vice President Innovation	Management	1	0.93
Associate	Other	1	0.93
Business Analyst	Other	1	0.93
Data Analyst	Other	1	0.93
Economist	Other	1	0.93

Job Title	Category	n	Frequency (%)
MBA	Other	1	0.93
Principal Bank Examiner	Other	1	0.93
Assistant Manager Financial Risk Consulting	Risk	1	0.93
Capital and Impairment Analyst	Risk	1	0.93
Credit Risk Analyst	Risk	1	0.93
Credit Risk Executive	Risk	1	0.93
Credit Risk Portfolio Manager	Risk	1	0.93
Credit Risk Reporting Specialist	Risk	1	0.93
Deputy General Manager of Risk Management	Risk	1	0.93
Financial Risk Manager	Risk	1	0.93
Global SME Lead for Expected Credit Losses	Risk	1	0.93
Head of Credit Analytics	Risk	1	0.93
Head of Credit Portfolio Risk	Risk	1	0.93
Head of Credit Risk Models Department	Risk	1	0.93
Market Risk and Liquidity Risk Controller	Risk	1	0.93
Risk Modelling Analyst	Risk	1	0.93

Participants were asked to provide their organisations annual revenue in its local currency. For responses to this question to be valid, participants had to provide both a currency code (from a drop-down list) and a revenue value. Of the 107 responses, 21 participants did not provide a valid response to this question and their responses were removed from the data set analysed exclusively for this question. The R package 'lucr' (Keyes, 2016) allows for currencies to be converted to a currency of choice. A limitation however of 'lucr' is that its functions only permit one value to be converted at a time. As this data set contained 86 valid annual revenue currencies, a function had to be developed which leveraged the 'lucr' package to convert all organisational revenues efficiently. To respond to this requirement, an R package was developed for this purpose titled 'dfCurrencyConvert' (Stead, 2017) and is available for installation via GitHub (GitHub Incorporated, 2017). This package converted the organisational revenue currencies to U.S. Dollars ready for analysis.

After conversion, a significantly high organisational annual revenue was identified, USD$800 billion. This amount exceeds any international firm's annual revenue and as such, it was removed from the dataset. The R package 'psych' (Revelle, 2017) was used to provide descriptive statistics on the 85 remaining organisational revenue responses after currency conversion. The mean annual revenue was USD$12.317 billion, with the median significantly lower at USD$436.644 million. The smallest firm had an annual revenue of USD$32,158.82 with the largest at USD$237.238 billion. These results suggest that the participants on average represent large firms by a measure of annual revenue, however, the median and minimum demonstrate that participants also represent mid-sized and smaller firms. Table 11 provides a

summary of the descriptive statistics. An R console log of the currency conversion and the descriptive statistic calculation is in Appendix L.

Table 11: Respondent's Organisational Annual Revenue (USD$)

N	Mean	Median	Min	Max
85	$ 12,317,703,776.63	$ 436,644,457.90	$ 32,158.82	$ 237,238,074,338.55

4.3 Missing Value and Suspicious Response Analysis

Hair et al. (2014) recommend that researchers analyse their response data set for both missing values and suspicious responses. Of the 113 responses, 5 responses contained missing values. It appeared that respondents abandoned the survey having completed little to none of the descriptive statistics questions in section 1. Accordingly, these 5 responses were removed.

Hair et al. (2014) also warn of the straight-lining pattern and the negative impact it can have on SEM-PLS analysis. Straight lining occurs "when the respondent marks the same response for a high proportion of the questions" (Hair et al., 2014, p. 52). One of the responses was deemed to be characteristic of a straight lining pattern as all 63 measurement items were identical. Hair et al. (2014) recommend the removal of straight line responses so this response was also removed. After removal of the responses containing missing values and straight lining, 107 valid and complete responses remained.

4.4 Partial Least Square Descriptive Statistics

Mean, median, minimum and maximum values, along with standard deviations, skew, kurtosis and standard errors were calculated for each measurement item using R. The results can be found in Appendix D and the corresponding R console log can be found in Appendix K**.**

4.5 Measurement Model Evaluation

The evaluation of the SEM measurement model involves a determination of its reliability and validity, which is reliant upon whether the model is reflective or formative. As the measurement model in this study is reflective, Hair et al. (2014) recommend that its internal consistency reliability and validity be assessed. Hair et al. (2014) suggest the use of Cronbach's (1971) Alpha and composite reliability measure to evaluate internal consistency reliability, Average Variance Extracted (AVE) to determine the convergent validity and a combination of factor cross-loadings and AVE Fornell-Larcker criterions to determine discriminant validity.

4.5.1 Internal Consistency Reliability

Hair et al. (2014) define internal consistency reliability as "a form of reliability used to judge the consistency of results across items on the same test" (p. 116). It is used to determine "whether the items

measuring a construct are similar in their scores" (p. 116). Cronbach's Alpha is traditionally used to measure internal consistency reliability (Hair et al., 2014; Vatanasakdakul, 2007). For a measure to be deemed sufficiently reliable, Cronbach (1971) recommends that its Cronbach's alpha be equal to or exceed 0.70.

Cronbach's alpha has been criticised as tending to underestimate the internal consistency reliability and be rather sensitive to the number of items in the scale (Hair et al., 2014). As such, composite reliability was used as a second measure of internal consistency reliability which considers the outer loadings of the indicator variables (Hair et al., 2014). Composite reliability values between 0.70 and .90 are desired and deemed satisfactory (Hair et al., 2014). Equation 1 below is used to calculate composite reliability, where "λi, F, and , Θii, are the factor loading, factor variance, and unique/error variance respectively" (Chin, 2010, p. 671).

$$\rho_c = \frac{(\sum \lambda_i)^2 \text{ var } F}{(\sum \lambda_i)^2 \text{ var } F + \sum \Theta_{ii}},$$

Equation 1: Composite Reliability (Chin, 2010, p. 671)

All Cronbach's alpha values in the measurement model were greater than 0.70, and all composite reliability values calculated for the measurement model were greater than 0.90, therefore the measurement model has sufficient internal consistency reliability. The Cronbach's alpha and composite reliability values for the measurement model can be found in Table 12.

4.5.2 Convergent Validity

Hair et al. (2014) define convergent validity as "the extent to which a measure correlates positively with alternative measures of the same construct" (p. 102). They recommend the analysis of the construct's AVE as well outer loadings to determine convergent validity.

4.5.2.1 Average Variance Extracted (AVE)

Hair et al. (2014) define AVE as "the grand mean value of the squared loadings of the indicators associated with the construct" (p. 103). AVE values must equal or exceed 0.50 (Hair et al., 2014), which implies that "on average, the construct explains more than half of the variance of its indicators" (Hair et al., 2014, p. 103)**.** AVE is calculated using Equation 2 below, "where λi, F, and , Θii, are the factor loading, factor variance, and unique/error variance respectively" (Chin, 2010, p. 670).

$$AVE = \frac{\left(\sum \lambda_i{}^2\right) \text{var } F}{\left(\sum \lambda_i{}^2\right) \text{var } F + \sum \Theta_{ii}}$$

Equation 2: Average Variance Extracted (Chin, 2010, p. 670)

All AVE values were greater than 0.50 as demonstrated in Table 12.

4.5.2.2 Outer Loadings and Weights

Outer loadings are "the results of single regressions of each indicator variable on their corresponding construct" (Hair et al., 2014, p. 92), with high outer loadings indicating "that the associated indicators have much in common, which is captured by the construct" (Hair et al., 2014, p. 102). Chin (1998) recommends a minimum outer loading value of 0.707, while Hair et al. (2014) recommend 0.708. All outer loadings for the measurement items in the model were above Hair et al.'s (2014) required minimum of 0.708. Outer weights are "the results of multiple regression of a construct on its set of indicators" (Hair et al., 2014, p. 92) and commonly used to assess the relative importance of indicators in formative models (Hair et al., 2014).

T values are calculated from the standard errors of the path coefficients and are used to determine the significance of the path coefficients. T values derived from two-tailed tests that are equal to or greater than 1.65, 1.96 and 2.57 result in significance levels of 0.10, 0.05 and 0.01 respectively. Bootstrapping with 5000 sub-samples was run using SmartPLS to calculate the T values for the outer loadings and weights, which all had a significance level of 0.01.

Outer loadings, composite reliability, AVE and Cronbach's Alpha values can be found in Table 12. Outer loadings, standard deviations, T values and significance levels are in Table 13. Outer weights, standard deviations, T values and significance levels can be found in Table 14.

Table 12: Outer Loadings, Composite Reliability, AVE and Cronbach's Alpha Values

Construct and Measurement Items	Outer Loading	Composite Reliability	Average Variance Extracted (AVE)	Cronbach's Alpha
ACCURACY		**0.911**	**0.836**	**0.806**
ACCU1	0.933			
ACCU2	0.895			
BIG DATA CHARACTERISTICS		**0.929**	**0.723**	**0.904**
BDATA1	0.825			
BDATA2	0.870			
BDATA3	0.913			
BDATA4	0.859			
BDATA5	0.777			
PERCEIVED BENEFITS OF IFRS 9 APPLICATIONS		**0.933**	**0.736**	**0.911**
BENEFIT1	0.865			
BENEFIT2	0.801			
BENEFIT3	0.885			
BENEFIT4	0.855			
BENEFIT5	0.880			
CURRENCY		**0.965**	**0.903**	**0.946**
CURR1	0.952			
CURR2	0.966			
CURR3	0.933			
DEPENDABILITY		**0.909**	**0.833**	**0.800**
DPND1	0.925			
DPND2	0.900			
ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES		**0.983**	**0.950**	**0.974**
IFRS9BDA1	0.974			
IFRS9BDA2	0.973			
IFRS9BDA3	0.977			
ATTITUDE TOWARDS IFRS 9 COMPLIANCE		**0.962**	**0.863**	**0.947**
IFRS9COMP1	0.916			
IFRS9COMP2	0.925			
IFRS9COMP3	0.944			
IFRS9COMP4	0.932			
IFRS 9 ANALYTICS GOVERNANCE		**0.953**	**0.872**	**0.927**
IFRS9GOVN1	0.922			
IFRS9GOVN3	0.937			
IFRS9GOVN4	0.942			

Construct and Measurement Items	Outer Loading	Composite Reliability	Average Variance Extracted (AVE)	Cronbach's Alpha
INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS		**0.986**	**0.947**	**0.981**
IFRS9INTU1	0.968			
IFRS9INTU2	0.975			
IFRS9INTU3	0.976			
IFRS9INTU4	0.972			
IFRS 9 ANALYTICS PERSONNEL CAPABILITIES		**0.965**	**0.902**	**0.946**
IFRS9PERS1	0.943			
IFRS9PERS2	0.952			
IFRS9PERS3	0.955			
IFRS 9 ANALYTICS PLANNING		**0.953**	**0.872**	**0.927**
IFRS9PLAN1	0.915			
IFRS9PLAN3	0.948			
IFRS9PLAN4	0.938			
INFORMATION QUALITY		**0.975**	**0.929**	**0.962**
INFOQ1	0.963			
INFOQ2	0.960			
INFOQ3	0.968			
INTEGRATION		**0.942**	**0.843**	**0.907**
INTG1	0.891			
INTG2	0.925			
INTG3	0.938			
RELIABILITY		**0.904**	**0.758**	**0.839**
REL1	0.876			
REL3	0.936			
RELI2	0.795			
SERVICE QUALITY		**0.981**	**0.945**	**0.971**
SERVQ1	0.979			
SERVQ2	0.965			
SERVQ3	0.972			
SYSTEM QUALITY		**0.963**	**0.897**	**0.942**
SYSQ1	0.945			
SYSQ2	0.941			
SYSQ3	0.956			

Table 13: Outer Loadings, Standard Deviations, T Values, P Values and Significance Levels

Construct and Measurement Items	Outer Loading	Standard Deviation	T Values	P Values	Significance
ACCURACY					
ACCU1	0.933	0.01	91.676	0.000	0.01
ACCU2	0.895	0.047	19.158	0.000	0.01
BIG DATA CHARACTERISTICS					
BDATA1	0.825	0.036	22.844	0.000	0.01
BDATA2	0.870	0.028	30.596	0.000	0.01
BDATA3	0.913	0.02	46.564	0.000	0.01
BDATA4	0.859	0.031	27.29	0.000	0.01
BDATA5	0.777	0.054	14.348	0.000	0.01
PERCEIEVED BENEFITS OF IFRS 9 APPLICATIONS					
BENEFIT1	0.865	0.028	30.421	0.000	0.01
BENEFIT2	0.801	0.047	17.033	0.000	0.01
BENEFIT3	0.885	0.035	25.571	0.000	0.01
BENEFIT4	0.855	0.042	20.313	0.000	0.01
BENEFIT5	0.880	0.032	27.245	0.000	0.01
CURRENCY					
CURR1	0.952	0.013	72.537	0.000	0.01
CURR2	0.966	0.008	117.244	0.000	0.01
CURR3	0.933	0.015	63.179	0.000	0.01
DEPENDABILITY					
DPND1	0.925	0.013	69.394	0.000	0.01
DPND2	0.900	0.032	28.041	0.000	0.01
ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES					
IFRS9BDA1	0.974	0.007	142.882	0.000	0.01
IFRS9BDA2	0.973	0.007	133.959	0.000	0.01
IFRS9BDA3	0.977	0.01	94.315	0.000	0.01
ATTITUDE TOWARDS IFRS 9 COMPLIANCE					
IFRS9COMP1	0.916	0.023	39.973	0.000	0.01
IFRS9COMP2	0.925	0.026	35.736	0.000	0.01
IFRS9COMP3	0.944	0.017	55.179	0.000	0.01
IFRS9COMP4	0.932	0.022	42.767	0.000	0.01
IFRS 9 ANALYTICS GOVERNANCE					
IFRS9GOVN1	0.922	0.019	49.542	0.000	0.01
IFRS9GOVN3	0.937	0.017	55.165	0.000	0.01
IFRS9GOVN4	0.942	0.011	83.983	0.000	0.01

Construct and Measurement Items	Outer Loading	Standard Deviation	T Values	P Values	Significance
INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS					
IFRS9INTU1	0.968	0.009	103.661	0.000	0.01
IFRS9INTU2	0.975	0.01	97.586	0.000	0.01
IFRS9INTU3	0.976	0.009	112.237	0.000	0.01
IFRS9INTU4	0.972	0.011	91.535	0.000	0.01
IFRS 9 ANALYTICS PERSONNEL CAPABILITIES					
IFRS9PERS1	0.943	0.016	59.265	0.000	0.01
IFRS9PERS2	0.952	0.012	79.398	0.000	0.01
IFRS9PERS3	0.955	0.011	90.846	0.000	0.01
IFRS 9 ANALYTICS PLANNING					
IFRS9PLAN1	0.915	0.026	35.265	0.000	0.01
IFRS9PLAN3	0.948	0.013	73.331	0.000	0.01
IFRS9PLAN4	0.938	0.019	50.189	0.000	0.01
INFORMATION QUALITY					
INFOQ1	0.963	0.012	79.396	0.000	0.01
INFOQ2	0.960	0.02	47.975	0.000	0.01
INFOQ3	0.968	0.009	111.351	0.000	0.01
INTEGRATION					
INTG1	0.891	0.033	27.057	0.000	0.01
INTG2	0.925	0.024	38.904	0.000	0.01
INTG3	0.938	0.017	53.798	0.000	0.01
RELIABILITY					
REL1	0.876	0.059	14.943	0.000	0.01
REL3	0.936	0.015	61.707	0.000	0.01
RELI2	0.795	0.075	10.548	0.000	0.01
SERVICE QUALITY					
SERVQ1	0.979	0.005	199.05	0.000	0.01
SERVQ2	0.965	0.011	87.291	0.000	0.01
SERVQ3	0.972	0.008	127.13	0.000	0.01
SYSTEM QUALITY					
SYSQ1	0.945	0.021	45.438	0.000	0.01
SYSQ2	0.941	0.017	54.144	0.000	0.01
SYSQ3	0.956	0.011	83.321	0.000	0.01

Table 14: Outer Weights, Standard Deviations, T Values, P Values and Significance Levels

Construct and Measurement Items	PLS Weight	Standard Deviation	T Values	P Values	Significance
ACCURACY					
ACCU1	0.605	0.056	10.822	0.000	0.01
ACCU2	0.487	0.037	13.262	0.000	0.01
BIG DATA CHARACTERISTICS					
BDATA1	0.215	0.019	11.283	0.000	0.01
BDATA2	0.248	0.017	14.520	0.000	0.01
BDATA3	0.284	0.021	13.706	0.000	0.01
BDATA4	0.236	0.019	12.724	0.000	0.01
BDATA5	0.187	0.021	8.859	0.000	0.01
PERCEIVED BENEFITS OF IFRS 9 APPLICATIONS					
BENEFIT1	0.292	0.041	7.065	0.000	0.01
BENEFIT2	0.245	0.040	6.176	0.000	0.01
BENEFIT3	0.202	0.025	7.955	0.000	0.01
BENEFIT4	0.194	0.027	7.082	0.000	0.01
BENEFIT5	0.234	0.030	7.786	0.000	0.01
CURRENCY					
CURR1	0.354	0.017	20.547	0.000	0.01
CURR2	0.355	0.012	28.592	0.000	0.01
CURR3	0.343	0.016	21.694	0.000	0.01
DEPENDABILITY					
DPND1	0.584	0.039	14.981	0.000	0.01
DPND2	0.511	0.026	19.303	0.000	0.01
ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES					
IFRS9BDA1	0.339	0.007	46.667	0.000	0.01
IFRS9BDA2	0.333	0.007	44.853	0.000	0.01
IFRS9BDA3	0.354	0.007	50.056	0.000	0.01
ATTITUDE TOWARDS IFRS 9 COMPLIANCE					
IFRS9COMP1	0.271	0.016	17.473	0.000	0.01
IFRS9COMP2	0.236	0.014	17.419	0.000	0.01
IFRS9COMP3	0.289	0.015	18.664	0.000	0.01
IFRS9COMP4	0.280	0.015	18.659	0.000	0.01
IFRS 9 ANALYTICS GOVERNANCE					
IFRS9GOVN1	0.348	0.018	19.337	0.000	0.01
IFRS9GOVN3	0.337	0.015	22.233	0.000	0.01
IFRS9GOVN4	0.386	0.018	21.513	0.000	0.01

Construct and Measurement Items	PLS Weight	Standard Deviation	T Values	P Values	Significance
INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS					
IFRS9INTU1	0.252	0.007	34.303	0.000	0.01
IFRS9INTU2	0.249	0.008	31.948	0.000	0.01
IFRS9INTU3	0.271	0.010	28.082	0.000	0.01
IFRS9INTU4	0.256	0.006	42.307	0.000	0.01
IFRS 9 ANALYTICS PERSONNEL CAPABILITIES					
IFRS9PERS1	0.330	0.012	28.037	0.000	0.01
IFRS9PERS2	0.353	0.017	20.697	0.000	0.01
IFRS9PERS3	0.370	0.018	20.621	0.000	0.01
IFRS 9 ANALYTICS PLANNING					
IFRS9PLAN1	0.328	0.026	12.561	0.000	0.01
IFRS9PLAN3	0.394	0.031	12.888	0.000	0.01
IFRS9PLAN4	0.348	0.024	14.244	0.000	0.01
INFORMATION QUALITY					
INFOQ1	0.339	0.008	40.522	0.000	0.01
INFOQ2	0.344	0.009	39.917	0.000	0.01
INFOQ3	0.354	0.011	32.995	0.000	0.01
INTEGRATION					
INTG1	0.374	0.042	8.993	0.000	0.01
INTG2	0.350	0.023	15.365	0.000	0.01
INTG3	0.365	0.027	13.544	0.000	0.01
RELIABILITY					
REL1	0.369	0.044	8.451	0.000	0.01
REL3	0.444	0.045	9.951	0.000	0.01
RELI2	0.328	0.049	6.637	0.000	0.01
SERVICE QUALITY					
SERVQ1	0.353	0.007	54.189	0.000	0.01
SERVQ2	0.326	0.009	36.351	0.000	0.01
SERVQ3	0.349	0.009	40.290	0.000	0.01
SYSTEM QUALITY					
SYSQ1	0.340	0.020	17.214	0.000	0.01
SYSQ2	0.348	0.017	20.871	0.000	0.01
SYSQ3	0.368	0.016	22.413	0.000	0.01

4.5.3 Discriminant Validity

Discriminant Validity is "the extent to which a construct is truly distinct from other constructs by empirical standards" (Hair et al., 2014, p. 104). Determining that discriminant validity exists suggests that each construct is unique and that it reflects phenomena that other constructs do not (Hair et al., 2014). There are two common methods for testing for discriminant validity: an examination of the cross-loadings and calculation of the Fornell-Larcker criterion (Hair et al., 2014; Vatanasakdakul, 2007).

4.5.3.1 Cross Loadings

To determine discriminant validity through examination of the cross-loadings, "an indicator's outer loading on the associated construct should be greater than all of its loadings on other constructs (i.e., the cross-loadings)" (Hair et al., 2014, p. 105). In this research, each block of indicators loaded higher with their associated constructs, however, in the initial SmartPLS cross-loading output there was not a sufficiently large gap between some blocks.

To ensure cross construct tapping did not pose a problem, 51 cross-loading matrix reports were run in SmartPLS with each report featuring a variant of the measurement model. Ultimately it was decided to remove the assurance construct and the DPND3, ACCU3, IFRS9PLAN2 IFRS9GOVN2, IFRS9INTU4 measurement items from the measurement model to minimise any possibility of cross construct tapping. The final SmartPLS cross loading matrix can be found in Table 15.

Table 15: Smart PLS Cross Loadings Output

Constructs and Measurement Items	ACCURACY	BIG DATA CHARACTERISTICS	PERCEIVED BENEFITS OF IFRS 9 APPLICATIONS	CURRENCY	DEPENDABILITY	ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	ATTITUDE TOWARDS IFRS 9 COMPLIANCE	IFRS 9 ANALYTICS GOVERNANCE	INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	IFRS 9 ANALYTICS PERSONNEL CAPABILITIES	IFRS 9 ANALYTICS PLANNING	INFORMATION QUALITY	INTEGRATION	RELIABILITY	SERVICE QUALITY	SYSTEM QUALITY
ACCU1	**0.933**	0.309	0.402	0.614	0.500	0.509	0.464	0.373	0.385	0.414	0.338	0.755	0.421	0.389	0.498	0.567
ACCU2	**0.895**	0.247	0.285	0.536	0.347	0.428	0.330	0.334	0.320	0.297	0.252	0.607	0.323	0.319	0.328	0.420
BDATA1	0.106	**0.825**	0.192	0.130	0.343	0.380	0.189	0.209	0.233	0.328	0.142	0.273	0.593	0.436	0.305	0.545
BDATA2	0.299	**0.870**	0.303	0.384	0.463	0.541	0.280	0.320	0.375	0.380	0.187	0.414	0.738	0.471	0.508	0.629
BDATA3	0.370	**0.913**	0.415	0.448	0.555	0.625	0.371	0.434	0.406	0.515	0.311	0.458	0.709	0.606	0.564	0.720
BDATA4	0.293	**0.859**	0.345	0.382	0.504	0.574	0.227	0.335	0.292	0.432	0.259	0.401	0.646	0.397	0.518	0.600
BDATA5	0.195	**0.777**	0.417	0.346	0.333	0.513	0.305	0.390	0.417	0.384	0.359	0.383	0.552	0.398	0.349	0.475
BENEFIT1	0.304	0.364	**0.865**	0.388	0.271	0.511	0.457	0.605	0.498	0.500	0.541	0.502	0.282	0.423	0.273	0.440
BENEFIT2	0.383	0.407	**0.801**	0.458	0.307	0.608	0.420	0.611	0.392	0.589	0.617	0.417	0.367	0.446	0.350	0.525
BENEFIT3	0.294	0.313	**0.885**	0.432	0.225	0.576	0.315	0.501	0.344	0.515	0.454	0.427	0.218	0.330	0.322	0.439
BENEFIT4	0.344	0.319	**0.855**	0.455	0.211	0.557	0.330	0.446	0.312	0.521	0.450	0.455	0.251	0.360	0.312	0.468
BENEFIT5	0.313	0.265	**0.880**	0.449	0.206	0.553	0.323	0.543	0.431	0.584	0.516	0.404	0.161	0.243	0.340	0.362
CURR1	0.573	0.391	0.484	**0.952**	0.424	0.463	0.415	0.532	0.518	0.572	0.421	0.671	0.415	0.444	0.412	0.460
CURR2	0.639	0.421	0.502	**0.966**	0.481	0.538	0.402	0.524	0.449	0.626	0.426	0.673	0.450	0.456	0.501	0.533
CURR3	0.590	0.342	0.458	**0.933**	0.395	0.468	0.393	0.504	0.391	0.659	0.427	0.651	0.373	0.335	0.426	0.462
DPND1	0.446	0.538	0.283	0.460	**0.925**	0.474	0.339	0.409	0.345	0.339	0.255	0.501	0.606	0.501	0.760	0.587
DPND2	0.412	0.417	0.242	0.368	**0.900**	0.472	0.349	0.386	0.299	0.329	0.393	0.383	0.511	0.444	0.665	0.473
IFRS9BDA1	0.498	0.616	0.612	0.501	0.498	**0.974**	0.546	0.654	0.561	0.662	0.515	0.519	0.515	0.457	0.582	0.648

Constructs and Measurement Items	ACCURACY	BIG DATA CHARACTERISTICS	PERCEIVED BENEFITS OF IFRS 9 APPLICATIONS	CURRENCY	DEPENDABILITY	ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	ATTITUDE TOWARDS IFRS 9 COMPLIANCE	IFRS 9 ANALYTICS GOVERNANCE	INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	IFRS 9 ANALYTICS PERSONNEL CAPABILITIES	IFRS 9 ANALYTICS PLANNING	INFORMATION QUALITY	INTEGRATION	RELIABILITY	SERVICE QUALITY	SYSTEM QUALITY
IFRS9BDA2	0.494	0.612	0.629	0.478	0.509	**0.973**	0.530	0.633	0.556	0.661	0.504	0.531	0.504	0.554	0.562	0.673
IFRS9BDA3	0.517	0.599	0.666	0.527	0.508	**0.977**	0.547	0.670	0.598	0.720	0.561	0.567	0.521	0.500	0.590	0.640
IFRS9COMP1	0.374	0.327	0.433	0.333	0.388	0.531	**0.916**	0.576	0.558	0.406	0.560	0.360	0.296	0.423	0.341	0.287
IFRS9COMP2	0.389	0.258	0.350	0.353	0.264	0.462	**0.925**	0.497	0.582	0.395	0.522	0.376	0.267	0.391	0.236	0.268
IFRS9COMP3	0.423	0.354	0.418	0.437	0.409	0.559	**0.944**	0.613	0.617	0.503	0.586	0.490	0.393	0.405	0.384	0.352
IFRS9COMP4	0.450	0.265	0.425	0.446	0.324	0.504	**0.932**	0.566	0.623	0.490	0.577	0.511	0.301	0.370	0.304	0.337
IFRS9GOVN1	0.322	0.346	0.585	0.459	0.375	0.608	0.548	**0.922**	0.559	0.666	0.706	0.408	0.247	0.279	0.368	0.317
IFRS9GOVN3	0.332	0.334	0.589	0.499	0.444	0.588	0.585	**0.937**	0.605	0.652	0.757	0.468	0.365	0.360	0.407	0.370
IFRS9GOVN4	0.426	0.431	0.620	0.570	0.405	0.674	0.573	**0.942**	0.557	0.698	0.697	0.530	0.347	0.449	0.419	0.492
IFRS9INTU1	0.366	0.424	0.440	0.520	0.334	0.582	0.631	0.627	**0.968**	0.518	0.474	0.519	0.380	0.468	0.331	0.345
IFRS9INTU2	0.370	0.363	0.464	0.455	0.309	0.539	0.598	0.562	**0.975**	0.463	0.445	0.497	0.361	0.481	0.324	0.295
IFRS9INTU3	0.393	0.393	0.484	0.454	0.372	0.594	0.632	0.603	**0.976**	0.478	0.476	0.565	0.415	0.450	0.381	0.340
IFRS9INTU4	0.384	0.396	0.450	0.429	0.360	0.568	0.634	0.594	**0.972**	0.472	0.475	0.530	0.389	0.452	0.337	0.321
IFRS9PERS1	0.341	0.430	0.563	0.613	0.321	0.624	0.441	0.650	0.444	**0.943**	0.660	0.490	0.336	0.412	0.327	0.511
IFRS9PERS2	0.428	0.445	0.609	0.635	0.397	0.666	0.481	0.676	0.464	**0.952**	0.655	0.505	0.365	0.393	0.437	0.538
IFRS9PERS3	0.354	0.502	0.627	0.608	0.326	0.699	0.461	0.724	0.502	**0.955**	0.622	0.487	0.360	0.373	0.430	0.526
IFRS9PLAN1	0.295	0.220	0.538	0.429	0.282	0.463	0.574	0.701	0.408	0.619	**0.915**	0.407	0.132	0.244	0.270	0.330
IFRS9PLAN3	0.323	0.318	0.599	0.414	0.362	0.555	0.582	0.734	0.450	0.675	**0.948**	0.444	0.264	0.345	0.342	0.437
IFRS9PLAN4	0.296	0.276	0.566	0.411	0.329	0.490	0.542	0.719	0.489	0.603	**0.938**	0.422	0.228	0.348	0.363	0.401

Constructs and Measurement Items	ACCURACY	BIG DATA CHARACTERISTICS	PERCEIVED BENEFITS OF IFRS 9 APPLICATIONS	CURRENCY	DEPENDABILITY	ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	ATTITUDE TOWARDS IFRS 9 COMPLIANCE	IFRS 9 ANALYTICS GOVERNANCE	INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	IFRS 9 ANALYTICS PERSONNEL CAPABILITIES	IFRS 9 ANALYTICS PLANNING	INFORMATION QUALITY	INTEGRATION	RELIABILITY	SERVICE QUALITY	SYSTEM QUALITY
INFOQ1	0.701	0.390	0.477	0.674	0.424	0.487	0.437	0.495	0.522	0.504	0.444	**0.963**	0.467	0.451	0.427	0.543
INFOQ2	0.728	0.494	0.494	0.679	0.499	0.545	0.427	0.486	0.527	0.518	0.423	**0.960**	0.535	0.491	0.451	0.615
INFOQ3	0.744	0.437	0.526	0.672	0.487	0.566	0.496	0.478	0.521	0.481	0.449	**0.968**	0.480	0.490	0.488	0.616
INTG1	0.376	0.626	0.311	0.410	0.571	0.434	0.341	0.313	0.342	0.342	0.242	0.505	**0.891**	0.590	0.544	0.644
INTG2	0.352	0.715	0.238	0.370	0.577	0.515	0.278	0.335	0.378	0.348	0.199	0.431	**0.925**	0.493	0.585	0.602
INTG3	0.404	0.773	0.281	0.415	0.545	0.503	0.317	0.297	0.376	0.336	0.182	0.472	**0.938**	0.533	0.555	0.628
RELI1	0.251	0.492	0.247	0.270	0.424	0.381	0.312	0.249	0.346	0.278	0.193	0.390	0.521	**0.876**	0.318	0.530
RELI2	0.372	0.574	0.412	0.401	0.509	0.531	0.453	0.370	0.456	0.374	0.334	0.484	0.587	**0.936**	0.437	0.638
RELI3	0.403	0.347	0.464	0.476	0.418	0.426	0.338	0.412	0.441	0.439	0.357	0.415	0.412	**0.795**	0.338	0.471
SERVQ1	0.448	0.502	0.357	0.470	0.775	0.558	0.366	0.424	0.350	0.401	0.365	0.475	0.584	0.426	**0.979**	0.615
SERVQ2	0.444	0.546	0.348	0.475	0.726	0.570	0.303	0.413	0.334	0.412	0.301	0.464	0.615	0.407	**0.965**	0.651
SERVQ3	0.451	0.526	0.376	0.426	0.780	0.601	0.331	0.409	0.346	0.416	0.350	0.441	0.585	0.399	**0.972**	0.617
SYSQ1	0.521	0.670	0.455	0.513	0.500	0.547	0.279	0.350	0.306	0.500	0.405	0.617	0.633	0.572	0.536	**0.945**
SYSQ2	0.504	0.665	0.490	0.461	0.583	0.629	0.307	0.378	0.297	0.483	0.299	0.534	0.646	0.609	0.612	**0.941**
SYSQ3	0.529	0.675	0.533	0.477	0.574	0.722	0.368	0.473	0.346	0.583	0.485	0.595	0.656	0.617	0.679	**0.956**

4.5.3.2 Average Variance Extracted (AVE) Fornell Larcker Criterion

Hair et al. (2011) refer to the cross-loading method of determining discriminant validity as rather liberal. For this reason, it is recommended to employ a more conservative second method, calculation of the Fornell-Larcker criterion (Hair et al., 2014). The Fornell-Larcker criterion "compares the square root of the AVE values with the latent variable correlations" (Hair et al., 2014, p. 105). Analysis of the Fornell-Larcker criterion is similar to that of the cross-loadings, in that the researcher is to compare the Fornell-Larcker criterion values against those correlated with other constructs in a matrix table. For discriminant validity to be confirmed through calculation and analysis of the Fornell-Larcker criterion, "the square root of each construct's AVE should be greater than its highest correlation with any other construct" (Hair et al., 2014, p. 105).

In the initial SmartPLS cross-loading, each construct's AVE square root was greater than its highest correlation for other constructs, however, like the cross-loading output, some did not have a sufficiently large enough gap between the AVE square roots of other constructs. Along with the 51 cross-loading variants run through SmartPLS, 51 Fornell-Larcker criterion matrix reports were also run to minimise cross construct tapping. As previously mentioned, the assurance construct and the DPND3, ACCU3, IFRS9PLAN2 IFRS9GOVN2, IFRS9INTU4 measurement items were removed from the measurement model to minimise any possibility of cross construct tapping.

The final SmartPLS AVE Fornell Larcker Criterion matrix can be found in Table 16.

Table 16: Smart PLS Latent Construct Correlation (Fornell-Larcker Criterion) Matrix

Constructs	ACCURACY	ATTITUDE TOWARDS IFRS 9 COMPLIANCE	BIG DATA CHARACTERISTICS	CURRENCY	DEPENDABILITY	IFRS 9 ANALYTICS GOVERNANCE	IFRS 9 ANALYTICS PERSONNEL CAPABILITIES	IFRS 9 ANALYTICS PLANNING	INFORMATION QUALITY	INTEGRATION	INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	PERCEIEVED BENEFITS OF IFRS 9 APPLICATIONS	RELIABILITY	SERVICE QUALITY	SYSTEM QUALITY
ACCURACY	**0.914**															
ATTITUDE TOWARDS IFRS 9 COMPLIANCE	0.441	**0.929**														
BIG DATA CHARACTERISTICS	0.307	0.326	**0.850**													
CURRENCY	0.632	0.425	0.405	**0.950**												
DEPENDABILITY	0.471	0.376	0.527	0.457	**0.913**											
IFRS 9 ANALYTICS GOVERNANCE	0.388	0.609	0.399	0.548	0.436	**0.934**										
IFRS 9 ANALYTICS PERSONNEL CAPABILITIES	0.395	0.486	0.484	0.651	0.366	0.721	**0.950**									
IFRS 9 ANALYTICS PLANNING	0.327	0.606	0.293	0.447	0.350	0.770	0.679	**0.934**								
INFORMATION QUALITY	0.752	0.471	0.457	0.700	0.488	0.504	0.520	0.455	**0.964**							
INTEGRATION	0.412	0.341	0.767	0.434	0.615	0.343	0.373	0.227	0.512	**0.918**						
INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	0.389	0.641	0.405	0.477	0.354	0.613	0.496	0.481	0.543	0.397	**0.973**					

Constructs	ACCURACY	ATTITUDE TOWARDS IFRS 9 COMPLIANCE	BIG DATA CHARACTERISTICS	CURRENCY	DEPENDABILITY	IFRS 9 ANALYTICS GOVERNANCE	IFRS 9 ANALYTICS PERSONNEL CAPABILITIES	IFRS 9 ANALYTICS PLANNING	INFORMATION QUALITY	INTEGRATION	INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	PERCEIEVED BENEFITS OF IFRS 9 APPLICATIONS	RELIABILITY	SERVICE QUALITY	SYSTEM QUALITY
ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	0.516	0.555	0.624	0.515	0.518	0.669	0.699	0.541	0.553	0.527	0.587	**0.975**				
PERCEIEVED BENEFITS OF IFRS 9 APPLICATIONS	0.382	0.440	0.394	0.506	0.289	0.642	0.633	0.609	0.518	0.303	0.473	0.652	**0.858**			
RELIABILITY	0.390	0.428	0.550	0.434	0.520	0.392	0.413	0.337	0.495	0.588	0.475	0.516	0.426	**0.871**		
SERVICE QUALITY	0.461	0.344	0.539	0.470	0.783	0.427	0.421	0.349	0.473	0.612	0.353	0.593	0.371	0.423	**0.972**	
SYSTEM QUALITY	0.547	0.337	0.708	0.510	0.584	0.425	0.553	0.420	0.614	0.681	0.335	0.670	0.522	0.634	0.645	**0.947**

4.6 Structural Model Evaluation

Once the reliability and validity of the measures have been examined through an evaluation of the measurement model, Hair et al. (2014) recommend researchers move on to an assessment of the structural model. The structural model "represents the relationships between constructs or latent variables that were hypothesized in the research model" (Duarte and Raposo, 2010, p. 466). Hair et al. (2014, p. 169) recommend a 5-step process to evaluate the structural model:

1. Assess for collinearity issues
2. Assess the significance and relevance of the structural model relationships
3. Assess the Coefficient of Determination (R^2)
4. Assess the effect size (f2)
5. Assess the predictive relevance q^2

4.6.1 Collinearity Assessment

Collinearity refers to "correlations between two formative indicators" (Hair et al., 2014, p. 123), and becomes problematic when two or more formative indicators are highly correlated, which implies that they either contain the same information or the information contained "is a linear combination of another indicator" (Hair et al., 2014, p. 123). Highly correlated formative indicators have a negative impact on SEM-PLS as it disrupts weight estimation and statistical significance calculation (Hair et al., 2014).

Variance inflation factor (VIF) is encouraged by Hair et al. (2014) to test for collinearity. The square root of the VIF is "the degree to which the standard error has been increased due to the presence of collinearity" (Hair et al., 2014), with VIF values greater than 5 indicating high collinearity. Additionally, VIF values greater than 10 indicate serious problems with collinearity (Pallant, 2005). SmartPLS was used to calculate VIF values for the structural model to identify potential issues with collinearity. All first order constructs in the model were set as latent variables. As the model features only reflective measurements, the inner VIF values from SmartPLS's collinearity statistics report were examined. All inner model VIF values for the model were less than 5, suggesting that the model's constructs had no collinearity related issues. The inner model VIF values for the measurement model can be found in Appendix E.

4.6.2 Significance and Relevance of the Structural Model Relationships

SEM-PLS obtains estimates for structural model relationships, which "represent the hypothesized relationships among the constructs" (Hair et al., 2014, pp. 107 – 171). These structural model relationships are known as the path coefficients, and their value can range between -1 and +1 (Hair et al., 2014). Strong positive relationships are those closer to +1, and strong negative relationships are those closer to -1 (Hair

et al., 2014). Path coefficients closer to zero are weak relationships, and the closer to zero they are more likely to be insignificant (Hair et al., 2014).

The standard error of the path coefficient is used to determine its significance and is derived from bootstrapping, which Hair et al., (2014) defines as "a resampling technique that draws a large number of subsamples from the original data (with replacement) and estimates models for each subsample" (p. 201). Hair et al. (2014) recommend 5000 subsamples to be created in the bootstrapping procedure, a number also recommended within SmartPLS. T values are calculated from the standard errors of the path coefficients and are used to determine the significance of the path coefficients. T-values derived from two-tailed tests that are equal to or greater than 1.65, 1.96 and 2.57 result in significance levels of 0.10, 0.05 and 0.01 respectively.

Bootstrapping with 5000 subsamples was run using SmartPLS. The calculated T-Values and P-Values are shown in Table 17 alongside their corresponding significance levels.

Table 17: Path Coefficient Results

Construct Relationships	Actual Effect	Path Coefficient	T Values	P Values	Significance Level
ACCURACY → INFORMATION QUALITY	+	0.515	6.785	0.000	0.01
ATTITUDE TOWARDS IFRS 9 COMPLIANCE → PERCEIEVED BENEFITS OF IFRS 9 APPLICATIONS	+	0.232	2.065	0.039	0.05
BIG DATA CHARACTERISTICS → SYSTEM QUALITY	+	0.377	2.432	0.015	0.05
CURRENCY → INFORMATION QUALITY	+	0.374	4.442	0.000	0.01
DEPENDABILITY → SERVICE QUALITY	+	0.783	20.387	0.000	0.01
IFRS 9 ANALYTICS GOVERNANCE → ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	+	0.391	2.856	0.004	0.01
IFRS 9 ANALYTICS PERSONNEL CAPABILITIES → ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	+	0.472	3.904	0.000	0.01
IFRS 9 ANALYTICS PLANNING → ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	-	-0.080	0.65	0.516	Not Significant

Construct Relationships	Actual Effect	Path Coefficient	T Values	P Values	Significance Level
INFORMATION QUALITY → ATTITUDE TOWARDS IFRS 9 COMPLIANCE	+	0.303	2.663	0.008	0.01
INFORMATION QUALITY → INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	+	0.415	3.545	0.000	0.01
INTEGRATION → SYSTEM QUALITY	+	0.216	1.659	0.097	0.10
INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS → PERCEIEVED BENEFITS OF IFRS 9 APPLICATIONS	+	0.324	2.874	0.004	0.01
ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES → ATTITUDE TOWARDS IFRS 9 COMPLIANCE	+	0.509	3.817	0.000	0.01
ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES → INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	+	0.543	4.531	0.000	0.01
RELIABILITY → SYSTEM QUALITY	+	0.299	2.834	0.005	0.01
SERVICE QUALITY → ATTITUDE TOWARDS IFRS 9 COMPLIANCE	+	0.037	0.319	0.75	Not Significant
SERVICE QUALITY → INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	+	0.032	0.297	0.767	Not Significant
SYSTEM QUALITY → ATTITUDE TOWARDS IFRS 9 COMPLIANCE	-	-0.215	1.535	0.125	Not Significant
SYSTEM QUALITY → INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	-	-0.305	2.386	0.017	0.05

4.6.3 Coefficient of Determination (R^2)

The coefficient of determination (R^2) is "a measure of the model's predictive accuracy and is calculated as the squared correlation between a specific endogenous construct's actual and predicted values" (Hair et al., 2014, p. 174). The coefficient is used to explain the variance of endogenous constructs from its linked exogenous constructs, with values ranging from 0 to 1 (Hair et al., 2014).

Perfect prediction of the endogenous construct from its linked exogenous constructs is achieved when the coefficient is equal to 1 (Vatanasakdakul, 2007). Higher coefficient of determination (R^2) values implies greater predictive power of the model (Vatanasakdakul and D'Ambra, 2007). The remainder of this section discusses each endogenous construct's R^2 values, which are also summarised in Table 18.

Table 18: Coefficient of Determination (R^2) Summary

Construct	R^2 Values	Standard Deviation	T Values	P Values
ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	0.548	0.070	7.828	0.000
SYSTEM QUALITY	0.604	0.075	8.025	0.000
INFORMATION QUALITY	0.649	0.058	11.201	0.000
SERVICE QUALITY	0.613	0.061	10.111	0.000
INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	0.454	0.071	6.364	0.000
ATTITUDE TOWARDS IFRS 9 COMPLIANCE	0.366	0.091	4.040	0.000
PERCEIEVED BENEFITS OF IFRS 9 APPLICATIONS	0.255	0.076	3.349	0.001

4.6.3.1 R^2 of Organisational Big Data Analytics Capabilities

Organisational Big Data Analytics Capabilities has an R^2 value of 0.548. This implies that 54.80% of the variance in Organisational Big Data Analytics Capabilities is explained by IFRS 9 Analytics Planning, IFRS 9 Analytics Governance and IFRS 9 Analytics Personnel Capabilities.

4.6.3.2 R^2 of System Quality

The System Quality construct has an R^2 value of 0.604 which implies that 60.40% of the variance in System Quality is explained by Big Data Characteristics, Reliability and Integration.

4.6.3.3 R^2 of Information Quality

The Information Quality construct has an R^2 value of 0.649 which implies that Currency and Accuracy explain 64.90% of the variance in Information Quality.

4.6.3.4 R^2 of Service Quality

The Service Quality construct's R^2 value is 0.613 which suggests that 61.30% of the variance in Service Quality is explained by Dependability.

4.6.3.5 R^2 of Intention to Use Big Data Analytics Applications

The Intention to Use Big Data Analytics Applications construct has an R^2 value of 0.454. This suggests that Organisational Big Data Analytics Capabilities, System Quality, Information Quality and Service Quality explains 45.40% of the variance in Intention to Use Big Data Analytics Applications.

4.6.3.6 R^2 of Attitude Towards IFRS 9 Compliance

The Attitude Towards IFRS 9 Compliance construct's R^2 value is .366. This suggests that 36.60% of the variance in Attitude Towards IFRS 9 Compliance is explained by Organisational Big Data Analytics Capabilities, System Quality, Information Quality and Service Quality.

4.6.3.7 R^2 of Perceived Benefits of IFRS 9 Applications

Perceived Benefits of IFRS 9 Applications has an R^2 value of .255. This suggests that 25.50% of the variance in Perceived Benefits of IFRS 9 Applications is explained by Intention to Use IFRS 9 Applications and Attitude Towards IFRS 9 Compliance.

4.6.4 Effect Size f^2

f^2 effect size is defined as "the change in the R^2 value when a specified exogenous construct is omitted from the model" (Hair et al., 2014, p. 177) and can be used "to evaluate whether the omitted construct has a substantive effect on the endogenous constructs" (Hair et al., 2014, p. 177). The degree of effect between constructs is determined by the f^2 effect value, with values of 0.02, 0.15 and 0.35 representing small, medium and large effects respectively (Cohen, 1988). f^2 effect size is calculated using Equation 3 below, "where $R^2_{included}$ and $R^2_{excluded}$ are the R-squares provided on the latent dependent variable when the predictor latent variable is used or omitted in the structural equation respectively." (Chin, 2010, p, 675).

$$f^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}}$$

Equation 3: Effect Size f^2 (Chin, 2010, p. 670)

Blindfolding in SmartPLS was used to calculate f^2 effect size values, with the results shown in Table 19. Dependability and Accuracy have a large effect on Service Quality and Information Quality respectively. Currency, IFRS 9 Analytics Personnel Capabilities and Information Quality have a medium effect on Information Quality, Organisational Big Data Analytics Capabilities and Intention to Use IFRS 9 Analytics

Applications respectively. Moreover, Organisational Big Data Analytics Capabilities has a medium effect on both Intention to Use IFRS 9 Analytics Applications and Attitude Towards IFRS 9 Compliance. IFRS 9 Analytics Governance and Information Quality have a small effect on Organisational Big Data Analytics Capabilities and Attitude Towards IFRS 9 Compliance respectively. Reliability, Big Data Characteristics and Integration have a small effect on System Quality, which in turn has a small effect on Attitude Towards IFRS 9 Compliance. Both Intention to Use IFRS 9 Analytics Applications and Attitude Towards IFRS 9 Compliance have a small effect on Perceived Benefits of IFRS 9 Applications. System Quality also has a small effect on Intention to Use IFRS 9 Analytics Applications.

Table 19: Effect Size f^2 Results

Construct Relationships	f^2 Values	T Values	P Values	Degree of Effect
DEPENDABILITY → SERVICE QUALITY	1.587	3.610	0.000	**Large**
ACCURACY → INFORMATION QUALITY	0.454	2.497	0.013	**Large**
ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES → INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	0.261	1.679	0.093	**Medium**
CURRENCY → INFORMATION QUALITY	0.240	1.817	0.069	**Medium**
IFRS 9 ANALYTICS PERSONNEL CAPABILITIES → ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	0.218	1.562	0.118	**Medium**
ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES → ATTITUDE TOWARDS IFRS 9 COMPLIANCE	0.198	1.444	0.149	**Medium**
INFORMATION QUALITY → INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	0.184	1.442	0.149	**Medium**
RELIABILITY → SYSTEM QUALITY	0.142	1.366	0.172	**Small**
BIG DATA CHARACTERISTICS → SYSTEM QUALITY	0.142	0.929	0.353	**Small**
IFRS 9 ANALYTICS GOVERNANCE → ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	0.113	1.282	0.200	**Small**
INFORMATION QUALITY → ATTITUDE TOWARDS IFRS 9 COMPLIANCE	0.085	1.051	0.293	**Small**
INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS → PERCEIVED BENEFITS OF IFRS 9 APPLICATIONS	0.083	1.153	0.249	**Small**
SYSTEM QUALITY → INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	0.068	1.025	0.306	**Small**

Construct Relationships	f^2 Values	T Values	P Values	Degree of Effect
INTEGRATION → SYSTEM QUALITY	0.044	0.681	0.496	**Small**
ATTITUDE TOWARDS IFRS 9 COMPLIANCE → PERCEIVED BENEFITS OF IFRS 9 APPLICATIONS	0.043	0.926	0.354	**Small**
SYSTEM QUALITY → ATTITUDE TOWARDS IFRS 9 COMPLIANCE	0.029	0.696	0.486	**Small**
IFRS 9 ANALYTICS PLANNING → ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	0.005	0.236	0.814	$f^2 < 0.02$
SERVICE QUALITY → ATTITUDE TOWARDS IFRS 9 COMPLIANCE	0.001	0.064	0.949	$f^2 < 0.02$
SERVICE QUALITY → INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	0.001	0.055	0.957	$f^2 < 0.02$

4.6.5 Effect Size q^2

Stone-Geisser's q^2 predictive relevance test can also be used as a model fit assessment in SEM-PLS (Stone 1974, Geisser 1974). The q^2 value is obtained through a process called blindfolding, which omits or 'blindfolds' data "from a particular block of indicators during parameter estimations and then attempts to estimate the omitted part using the estimated parameters" (Chin, 1998, p. 317). If a construct's q^2 value is greater than zero, this implies that the model has achieved predictive relevance for the construct. q^2 values below zero indicate no predictive relevance for the construct (Chin, 1998). The q^2 effect size value is calculated using Equation 4 below:

$$q^2 = \frac{Q^2_{included} - Q^2_{excluded}}{1 - Q^2_{included}}$$

Equation 4: Effect Size q^2 (Chin, 2010, p. 680; Hair et al., 2014, p. 183)

Table 20 shows the SmartPLS q^2 results after blindfolding with an omission distance of 7. These results demonstrate that the model has predictive relevance for Attitude Towards IFRS 9 Compliance: Attitude towards IFRS 9 Compliance, Information Quality, Intention to Use IFRS 9 Analytics Applications, Organisational Big Data Analytics Capabilities, Perceived Benefits of IFRS 9 Applications, Service Quality and System Quality.

Table 20: Effect Size q^2 Results

Construct	SSO	SSE	q^2 (=1-SSE/SSO)
ACCURACY	214	214.000	
ATTITUDE TOWARDS IFRS 9 COMPLIANCE	428	305.763	0.286
BIG DATA CHARACTERISTICS	535	535.000	
CURRENCY	321	321.000	
DEPENDABILITY	214	214.000	
IFRS 9 ANALYTICS GOVERNANCE	321	321.000	
IFRS 9 ANALYTICS PERSONNEL CAPABILITIES	321	321.000	
IFRS 9 ANALYTICS PLANNING	321	321.000	
INFORMATION QUALITY	321	141.210	0.560
INTEGRATION	321	321.000	
INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	428	261.085	0.390
ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES	321	166.534	0.481
PERCEIEVED BENEFITS OF IFRS 9 APPLICATIONS	535	447.272	0.164
RELIABILITY	321	321.000	
SERVICE QUALITY	321	146.049	0.545
SYSTEM QUALITY	321	159.994	0.520

4.7 Control Variables

Vatanasakdakul (2007) recommends the use of control variables to detect patterns in the response data set. Firstly, to control for the potential of educational level impacting upon the structural model, participant educational level responses were included as a control variable. Secondly, to control for the potential of experience with IFRS impacting upon the structural model, respondent years' experience with IFRS responses were included as a control variable. Finally, to control for the potential of organisational sizes impacting upon the structural model, respondent's organisation size responses were included as a control variable.

The structural model featuring the inclusion of control variables can be found in Appendix G. This model was bootstrapped using SmartPLS with 5000 subsamples as recommended by Hair et al. (2014). Upon examination of the bootstrapped structural model featuring the control variables, it was concluded that

the control variables did not change any of the significance levels of the path coefficients in the structural model.

4.8 Summary of Results

Table 21 shows a summary of the results of this study, specifically whether the hypotheses are supported by the outcome of the SEM-PLS path coefficient statistical results found in Table 17. Figures 16 and 17 on the following pages show the SmartPLS SEM-PLS Algorithm (Path Coefficient) and Bootstrapping at 5000 subsamples output correspondingly.

Table 21: Summary of Research Results

Research Question	Hypothesis	Independent Variable(s)	Dependent Variable	Results
Research Question 1: Do organisational big data analytics capabilities, system quality, information quality and service quality influence the intention to use IFRS 9 analytics applications and attitudes towards IFRS9 compliance?	**Hypothesis 1a:** Organisational Big Data Analytics Capabilities positively affect Intention to Use IFRS 9 Analytics Applications	Organisational Big Data Analytics Capabilities	Intention to Use IFRS 9 Analytics Applications	**Supported**
	Hypothesis 1b: Organisational Big Data Analytics Capabilities positively affect Attitude towards IFRS 9 Compliance	Organisational Big Data Analytics Capabilities	Attitude towards IFRS 9 Compliance	**Supported**
	Hypothesis 2a: System Quality will positively affect Intention to Use IFRS 9 Analytics Applications	System Quality	Intention to Use IFRS 9 Analytics Applications	Not Supported
	Hypothesis 2b: System Quality will positively affect Attitude towards IFRS 9 Compliance	System Quality	Attitude towards IFRS 9 Compliance	Not Supported
	Hypothesis 3a: Information Quality will positively affect Intention to Use IFRS 9 Analytics Applications	Information Quality	Intention to Use IFRS 9 Analytics Applications	**Supported**
	Hypothesis 3b: Information Quality will positively affect Attitude towards IFRS 9 Compliance	Information Quality	Attitude towards IFRS 9 Compliance	**Supported**
	Hypothesis 4a: Service Quality will positively affect Intention to Use IFRS 9 Analytics Applications	Service Quality	Intention to Use IFRS 9 Analytics Applications	Not Supported
	Hypothesis 4b: Service Quality will positively affect Attitude towards IFRS 9 Compliance	Service Quality	Attitude towards IFRS 9 Compliance	Not Supported

Research Question	Hypothesis	Independent Variable(s)	Dependent Variable	Results
Research Question 2: Does intention to use IFRS 9 analytics applications and attitude towards IFRS 9 compliance influence perceived benefits of IFRS 9 applications?	**Hypothesis 5:** Intention to Use IFRS 9 Analytics Applications will positively affect Perceived Benefits of IFRS 9 Applications	Intention to Use IFRS 9 Analytics Applications	Perceived Benefits of IFRS 9 Applications	**Supported**
	Hypothesis 6: Attitude towards IFRS 9 Compliance will positively affect Perceived Benefits of IFRS 9 Applications	Attitude towards IFRS 9 Compliance	Perceived Benefits of IFRS 9 Applications	**Supported**
Research Question 3: What constitutes valid and reliable scales for measuring organisational big data analytics capabilities?	**Hypothesis 7:** Organisational big data analytics capabilities is a multi-dimensional construct and it will be measured by IFRS 9 analytics planning, IFRS 9 analytics governance and IFRS 9 analytics personnel capabilities.	IFRS 9 Analytics Planning, IFRS 9 Analytics Governance and IFRS 9 Analytics Personnel Capabilities	Organisational Big Data Analytics Capabilities	**Partially Supported**
Research Question 4: What constitutes valid and reliable scales for measuring system quality?	**Hypothesis 8:** System quality is a multi-dimensional construct and it will be measured by big data characteristics, reliability and integration.	Big Data Characteristics, Reliability and Integration	System Quality	**Supported**
Research Question 5: What constitutes valid and reliable scales for measuring information quality?	**Hypothesis 9:** Information quality is a multi-dimensional construct and it will be measured by currency and accuracy	Currency and Accuracy	Information Quality	**Supported**
Research Question 6: What constitutes valid and reliable scales for measuring service quality?	**Hypothesis 10:** Service quality is a multi-dimensional construct and it will be measured by dependability and assurance.	Dependability and Assurance	Service Quality	**Partially Supported**

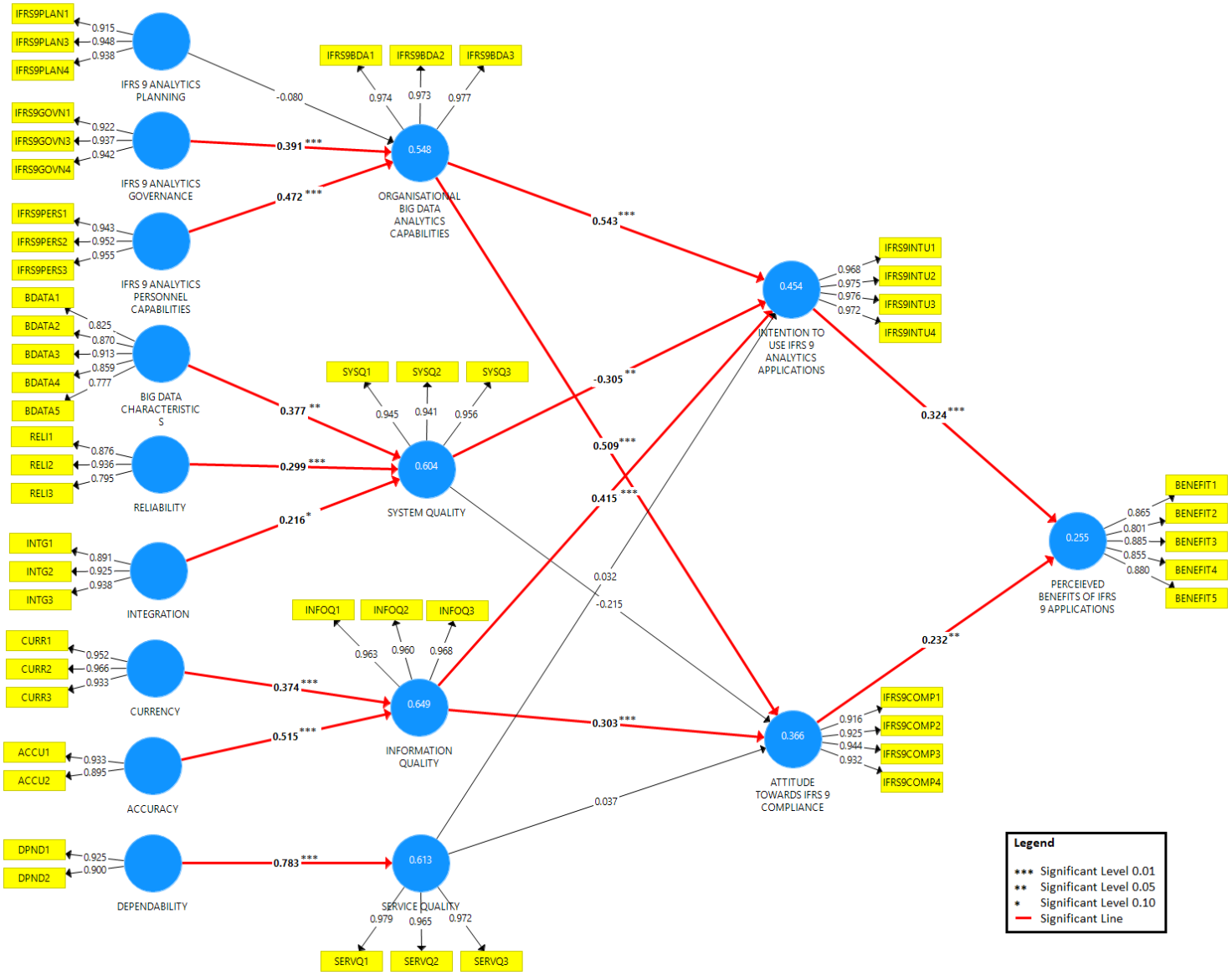


Figure 16: SmartPLS SEM-PLS Algorithm (Path Coefficient)

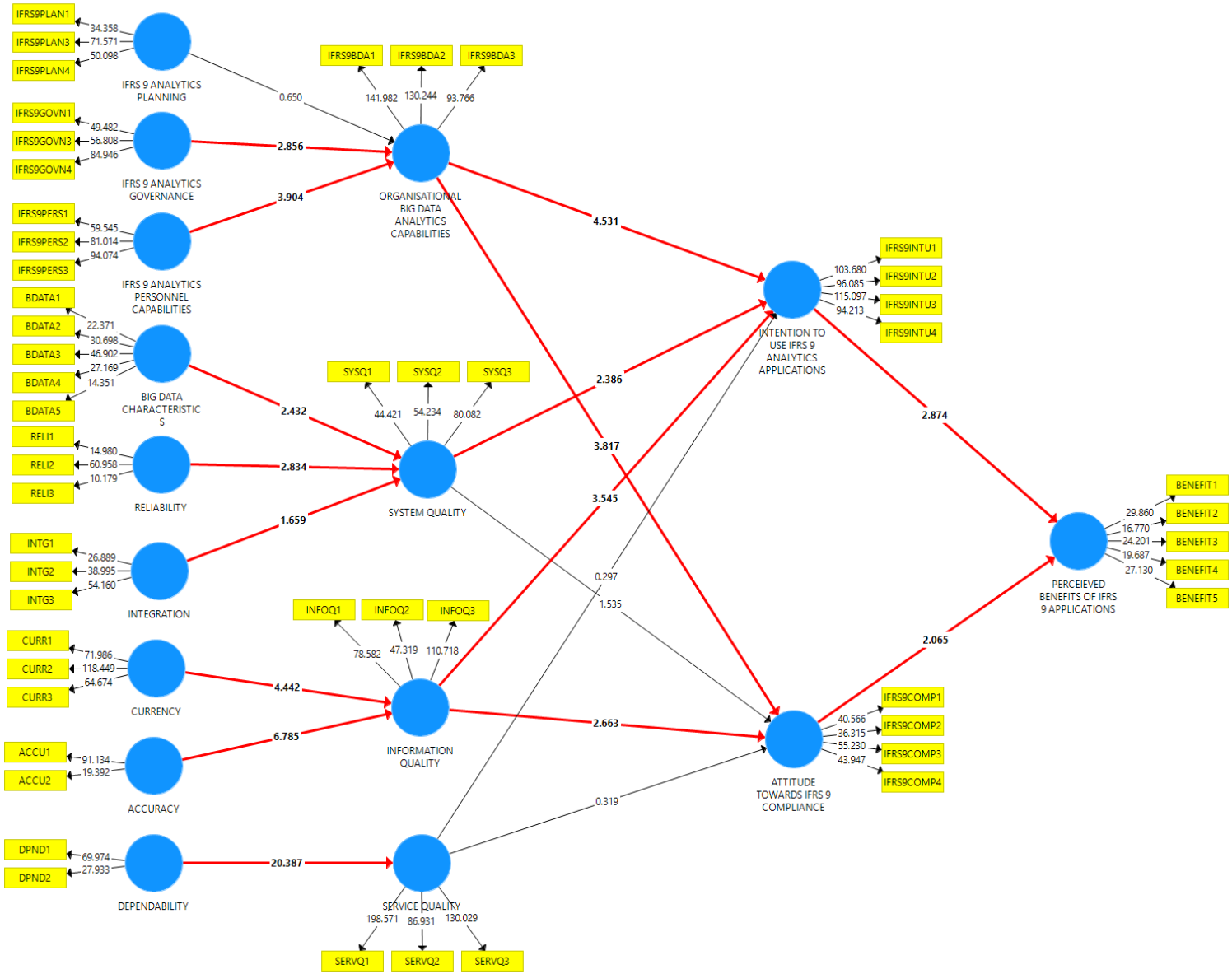


Figure 17: SmartPLS Bootstrapping (5000 Sub Samples) Measurement Model Output

Chapter 5: Discussion

5.1 Introduction

This chapter discusses the findings of the measurement and structural model analysis established in Chapter 4. Each of the research questions and corresponding hypotheses will be addressed, with research implications proposed.

5.2 Discussion of Structural Model Results

5.2.1 Factors Influencing Intention to Use IFRS 9 Applications and Attitudes towards IFRS 9 Compliance

This section reflects upon the first research question and its associated hypotheses which were tested using SEM-PLS.

Research Question 1: Do organisational big data analytics capabilities, system quality, information quality and service quality influence the intention to use IFRS 9 analytics applications and attitudes towards IFRS9 compliance?

Hypothesis 1a: Organisational Big Data Analytics Capabilities positively affect Intention to Use IFRS 9 Analytics Applications (Accepted)

Hypothesis 1b: Organisational Big Data Analytics Capabilities positively affect Attitude towards IFRS 9 Compliance (Accepted)

Organisational big data analytics capabilities has a significant relationship with intention to use IFRS 9 analytics applications at significance level 0.01 and has a positive path coefficient of 0.543. As a result, hypothesis 1a is accepted. Additionally, organisational big data analytics capabilities has a significant relationship with attitude towards IFRS 9 compliance at significance level 0.01 with a positive path coefficient of 0.509. Correspondingly, hypothesis 1b is accepted.

Acceptance of hypothesis 1a suggests that industry professionals associated with information systems utilised by entities affected by the evolution of IFRS standards perceive the ability of their entity to conduct big data analytics and governance of such analytics as an important success factor. Contextually, this finding suggests that entities with a strong organisational capability to perform big data analytics are perceived to have a higher likelihood of complying with IFRS 9. This would imply that it is in the best

interest for entities affected by IFRS 9 to review their big data analytics capabilities to maximise the intended use of their IFRS 9 analytics applications.

Entities should turn their attention to the capabilities of their IFRS 9 analytics personnel, which was found to be the strongest first-order factor of the organisational big data analytics hierarchical component model with a path coefficient of 0.472. This construct refers to the talent, skills and knowledge of IFRS 9 analytics personnel. Therefore, the findings suggest that for an entity to have optimal organisational big data analytics capabilities, attention must first be focused on the capabilities of the individuals performing IFRS 9 analysis. Second to personnel capabilities was the first order construct of IFRS 9 analytics governance, featuring a positive path coefficient to organisational big data analytics capabilities of 0.391. For optimal organisational big data analytics capabilities to be achieved, the findings suggest entities should enhance the ability of the department assigned ownership of the IFRS 9 related big data analytics function to manage IT resources in a manner aligned with the entity's business needs.

Acceptance of hypothesis 1b implies that one of the factors which industry professionals perceive affect the ability of their entity to comply with the requirements of IFRS 9 is the capability of the entity to conduct big data analytics. The study also found that organisational big data analytics capabilities had the strongest relationship with attitudes towards compliance of any other construct in the structural model. This suggests that the ability of an entity to conduct big data analytics is the most important information systems related success factor affecting compliance with IFRS 9. This is an important finding as it highlights the need for entities affected by IFRS 9 to review and enhance their big data analytics capabilities. Specifically, successful compliance with IFRS 9 is primarily dependent on the talent, skills and knowledge of the entity's IFRS 9 big data analytics personnel and the capability of the entity's business unit assigned ownership of IFRS 9 big data analytics function to manage IT resources in a manner aligned with the needs of the entity.

The findings related to hypotheses 1a and 1b expand the potential for big data analytics capabilities research. Whilst extant literature has focused on the influence of big data analytics capabilities on firm performance (Akter et al., 2016; Fosso et al., 2017), this study suggests that the factor influences both DeLone and McLean's (2003) intention to use construct and the concept of attitudes towards compliance in the context of IFRS 9 requirements implementation. Furthermore, the findings related to hypothesis 1a contribute to both big data analytics capabilities and information systems success literature as it demonstrates that organisational big data analytics capabilities may be a valid independent variable of successful information systems and to maximise the intended use of IFRS 9 related applications, entities must consider organisational big data analytics capability factors.

Hypothesis 2a: System Quality will positively affect Intention to Use IFRS 9 Analytics Applications (Rejected)

Hypothesis 2b: System Quality will positively affect Attitude towards IFRS 9 Compliance (Rejected)

System quality was found not to have a significant positive relationship with both intention to use IFRS 9 analytics applications and attitude towards IFRS 9 compliance. Therefore, both hypotheses 2a and 2b are rejected. Petter et al. (2008) conducted a qualitative literature review and analysis on the implementation of DeLone and McLean's (2003) information systems success model in extant literature by analysing pairwise associations between the model's constructs. For the association between system quality and system use, Petter et al. (2008) found mixed support for a positive relationship. They explore several studies that found both a negative and positive association between system quality and variants of use, including intention to use. Gill (1995) for example found that technical aspects of expert systems used for artificial intelligence applications "does not guarantee high levels of adoption or long-term use" (p. 68).

Perhaps in this context system quality may not have been deemed a significant factor affectign intention to use IFRS 9 applications or attitudes towards compliance with the standard because the respondents tended to be financial, managerial or analytical industry professionals. As illustrated in Table 22, respondents holding finance, management and risk (analytical) natured job positions accounted for 59.81% of all respondents, whereas respondents holding IT natured job positions accounted for only 3.74%. Individuals belonging to these job position categories would be more concerned and familiar with the output qualities of these information systems alongside the ability of their entity's analytics actors to analyse the financial data required for compliance with IFRS 9 than the underlying IT artefacts facilitating the production of such output.

Table 22: Respondent Job Position Categorisation Summary

Category	n	Frequency (%)
Finance	24	22.43
Management	22	20.56
Risk	18	16.82
Consultant	15	14.02
Other	6	5.61
Audit	4	3.74
IT	4	3.74

Hypothesis 3a: Information Quality will positively affect Intention to Use IFRS 9 Analytics Applications (Accepted)

Hypothesis 3b: Information Quality will positively affect Attitude towards IFRS 9 Compliance (Accepted)

Information quality was found to have a significant relationship with intention to use IFRS 9 analytics applications at significance level 0.01 and have a positive path coefficient of 0.415. Accordingly, hypothesis 3a is accepted. Additionally, information quality was found to have a significant relationship on attitude towards IFRS 9 compliance at significance level 0.01 with a positive path coefficient of 0.415. As a result, hypothesis 3b is accepted. Information quality is a core dimension of DeLone and McLean's (2003) information systems success model. This study's finding that information quality has a positive and significant effect on intention to use validates previous positive findings of this association in extant literature, such as in studies by Rai, Lang, and Welker (2002) and Halawi, McCarthy, and Aronson (2007).

The acceptance of hypothesis 3a demonstrates that industry professionals associated with IFRS 9 implementation efforts perceive the output of their entity's information systems as a major success factor in determining the intention to use applications required for compliance. A particularly important information quality related concept is the output's accuracy, which had a positive significant path coefficient to information quality of 0.515 at significance level 0.01. To a lesser extent, the concept of currency was found to be an important information quality factor with a positive path coefficient to information quality at 0.374 at significance level 0.01. These findings suggest that both the accuracy and currency of the information systems output are significant success factors related to the implementation of IFRS 9, particularly where the intention for actors to use compliance applications is concerned. This finding suggests that entities affected by the standard may wish to review the processes and frameworks employed to maintain the quality of their information system's output. Governance over these processes is demonstrated to be a critical factor in ensuring the intention to use compliance applications. Such governance mechanisms should particularly focus on both the accuracy and currency of the output information.

The significant positive relationship found between information quality and attitudes towards IFRS 9 compliance in the acceptance of hypothesis 3b highlights the importance of accurate and timely information output from IFRS 9 information systems. This finding suggests that the quality of the information system's output is a significant success factor associated with IFRS 9 compliance. This reiterates the importance for affected entities to undertake a review of the governance mechanisms employed to protect the quality of the information system's output. This study has found that organisational big data analytics capabilities and information quality are the only two independent

constructs which have a positive and significant effect on attitudes towards IFRS 9 compliance. This implies that the ability of the information systems to provide accurate and current information output and for the entity to be capable of big data analytics are of paramount importance for affected entities to be successful in their IFRS 9 compliance efforts.

The acceptance of hypotheses 3a contributes to information systems success literature by validating the positive and significant relationship between the information quality and intention to use constructs. In addition, its acceptance demonstrates that this relationship can be used to study information systems success in the context of IFRS evolution and its effect on the information systems of affected entities. The acceptance of hypothesis 3b highlights that information quality is an important factor affecting attitudes towards compliance with an IFRS standard. This finding contributes to information systems success literature by proposing that attitudes towards compliance may be an acceptable dependent variable for financial regulatory applications of DeLone and McLean's (2003) information systems success model. The acceptance of hypothesis 3b also contributes to IFRS literature by demonstrating empirically that the quality of information produced by information systems is a critical success factor affecting attitudes towards compliance with new IFRS standards, particularly those sharing characteristics and requirements with IFRS 9.

Hypothesis 4a: Service Quality will positively affect Intention to Use IFRS 9 Analytics Applications (Rejected)

Hypothesis 4b: Service Quality will positively affect Attitude towards IFRS 9 Compliance (Rejected)

Service quality was found not to have a significant relationship with either intention to use IFRS 9 analytics applications or attitude towards IFRS 9 compliance. Correspondingly, hypotheses 4a and 4b are rejected. Petter et al.'s (2008) literature review of associations between the dimensions of DeLone and McLean's (2003) information system success model found "little literature that examines the relationship between service quality and use at the individual or organizational level" (p. 245). Petter et al. (2008) cite examples of literature which studied this relationship. Choe (1996) for example found that in accounting information systems utilised within Korean firms, information system support personnel experience was found to have a significant correlation with use. However, as the accounting information systems matured this relationship became non-significantly negatively correlated. In addition, Halawi et al. (2007) found in a study on the success of knowledge management systems that system quality did not have a positive relationship with intention to use.

Whilst this study has found that service quality does not have a significant relationship with either intention to use IFRS 9 applications or the perception that the standard will be complied with at this point, this may change when the standard becomes mandatory on January 1, 2018. The findings of Ernst and Young's (2017) industry survey suggested that most institutions surveyed intend to parallel run their IAS

39 and IFRS 9 compliance processes throughout the second half of 2017. As affected entities transition onto their IFRS 9 compliance infrastructures and processes, a realisation of the true impact of the information system support personnel may become more apparent. Therefore, future research may wish to compare the non-significant findings of this study with future studies on the influence of service quality on use of IFRS 9 analytics applications and the perception that the entities will continue to comply with the standard.

5.2.2 Factors Influencing Perceived Benefits of IFRS 9 Applications

This section reflects upon the second research question and its associated hypotheses which were tested using SEM-PLS.

Research Question 2: Does intention to use IFRS 9 analytics applications and attitude towards IFRS 9 compliance influence perceived benefits of IFRS 9 applications?

Hypothesis 5: Intention to Use IFRS 9 Analytics Applications will positively affect Perceived Benefits of IFRS 9 Applications (Accepted)

Hypothesis 6: Attitude towards IFRS 9 Compliance will positively affect Perceived Benefits of IFRS 9 Applications (Accepted)

Intention to use IFRS 9 analytics applications was found to have a significant relationship with perceived benefits of IFRS 9 applications at significance level 0.01 and have a positive path coefficient of 0.324. Therefore, hypothesis 5 is accepted. Attitude towards IFRS 9 compliance was also found to have a significant relationship with perceived benefits of IFRS 9 applications with a significance level of 0.05 and a positive path coefficient of 0.232. Accordingly, hypothesis 6 is accepted. Petter et al. (2008) note that extant literature provides moderate support for the association between intention to use and net benefits. Halawi et al. (2007) for example found a positive relationship between the two dimensions when studying the success of knowledge management systems. Several other studies have found a positive correlation between intention to use/use and net benefits (Goodhue and Thompson, 1995; Yoon and Guimaraes, 1995; Seddon and Kiew, 1996; Guimaraes and Igbaria, 1997; D'Ambra and Rice, 2001).

For the context of IFRS 9 requirements implementation into the information systems infrastructures of affected entities, this relationship demonstrates that industry professionals believe that the intended use of IFRS 9 applications is beneficial. Therefore, the acceptance of hypothesis 5 demonstrates that the intended use of IFRS 9 analytics applications is perceived by industry professionals to be a factor increasing risk decision-making efficiencies, improving functional coordination, increasing profit margins, enhancing market share and maximising strategic decision-making. This finding highlights the perceived strategic

importance of IFRS 9 analytics applications to affected entities. The acceptance of hypothesis 5 reflects the severity of the impact of IFRS 9 on affected entities. As this study has found that intended use of IFRS 9 applications has a significant positive effect on the realisation of benefits for affected entities, it can be said that a successful implementation of the standard's requirements and intended use of IFRS 9 compliance applications benefits affected entities strategically, financially and competitively. To ensure that entities benefit from the standard, they must optimise the intended use of IFRS 9 analytics applications. This can be achieved by paying close attention to their big data analytics capabilities and the ability of their information systems to produce accurate and current information.

Acceptance of hypothesis 6 demonstrates that the industry professional's perception that IFRS 9 will comply with impacts upon strategic, financial and competitive benefits of the affected entities. Like hypothesis 5, the acceptance of hypothesis 6 strengthens the determination that a successful implementation of IFRS 9 requirements into the operations of affected entities is a pivotal milestone. This finding may help to enhance the appreciation of the importance of compliance with new financial regulations for affected entities. Of the five measurement items for the benefits construct maximisation of profit margins had the highest path coefficient at 0.885. This finding suggests that industry professionals associate successful implementation of the standard with a range of positive performance aspects. Other measurement items of the benefits construct had high path coefficients, including those referring to the maximisation of strategic planning and increasing efficiencies in risk decision-making. As such, successful implementation of the requirements of IFRS 9 into affected entities is found by this study to benefit entities across many aspects of their operations. Future research may wish to explore alternative benefits associated with the use of IFRS 9 or financial regulatory compliance applications. Perhaps there are additional benefits associated with compliance with a standard like IFRS 9 such as satisfying shareholder expectations or avoidance of regulatory scrutiny and penalties which future research may wish to explore.

Acceptance of hypothesis 5 contributes to information systems success literature by validating the significant positive relationship between intention to use and net benefits. Additionally, determining this finding in the context of IFRS requirements implementation into affected entities responds to DeLone and McLean's (2003) call to test their information success model in new contexts. Information systems success literature may benefit from the added knowledge that in this context the relationship between these constructs is validated. Furthermore, the acceptance of hypothesis 6 contributes to information systems success literature by demonstrating that attitudes towards compliance with financial regulations affect the net benefits dimension. This finding may be applied to other financial related implementations of DeLone and McLean's (2003) information systems success model to account for potential deficiencies in explaining net benefit construct statistical variances. Moreover, the acceptance of hypothesis 5 and 6 may contribute to IFRS literature through the determination that industry professionals perceive that both the

use of applications intended for IFRS compliance as well as the perception that an affected entity can comply with the requirements of a new standard have positive and significant effects on the realisation of net benefits for affected entities.

Sections 5.2.3 through to 5.2.6 will discuss research questions 3 – 6. These questions seek to explore the validity and reliability of the hierarchal component models employed for the constructs organisational big data analytics, system quality, information quality and service quality.

5.2.3 Validity and Reliability of the Organisational Big Data Analytics Capabilities Measurement Scales

Research Question 3: What constitutes valid and reliable scales for measuring organisational big data analytics capabilities?

Hypothesis 7: Organisational big data analytics capabilities is a multi-dimensional construct and it will be measured by IFRS 9 analytics planning, IFRS 9 analytics governance and IFRS 9 analytics personnel capabilities. (Partially Accepted)

Hypothesis 7 was developed to explore whether organisational big data analytics capabilities is a multi-dimensional construct and can be measured by the first-order constructs IFRS 9 analytics planning, IFRS 9 analytics governance and IFRS 9 analytics personnel capabilities. The results of this study indicate that organisational big data analytics is indeed a multi-dimensional construct and can be measured by the first-order constructs of IFRS 9 analytics governance and IFRS 9 analytics personnel capabilities. However, hypothesis 7 can only be partially accepted as it was determined that IFRS 9 analytics planning did not have a significant relationship with organisational big data analytics capabilities.

IFRS 9 analytics governance has a significant positive path coefficient of 0.391 to organisational big data analytics capabilities at significance level 0.01. IFRS 9 analytics personnel capabilities has a significant path coefficient of 0.472 to organisational big data analytics capabilities at significance level 0.01. The construct of IFRS 9 analytics governance was adapted from Akter et al.'s (2016) and Fosso et al.'s (2017) big data analytics management capability construct. The IFRS 9 analytics personnel capabilities construct was adopted from both Akter et al.'s (2016) big data analytics talent capability and Fosso et al.'s (2017) big data analytics personnel expertise capability constructs.

The significant positive relationships between IFRS 9 analytics governance and IFRS 9 analytics personnel capabilities with organisational big data analytics capabilities suggest that in the context of IFRS 9 requirements implementation, industry professionals value the governance and management of IFRS 9 big data analytics alongside their peer's IFRS 9 analytical expertise. This finding demonstrates that governance of IFRS 9 big data analytics and the skills, talent and knowledge of IFRS 9 analytics personnel are significantly important factors in organisational big data analytic capabilities. The slightly higher path

coefficient of IFRS 9 analytics personnel capabilities suggests that industry professionals prioritise the expertise of the IFRS 9 analytics personnel over the ability of the entity to govern IFRS 9 big data analytics processes.

As stated in the discussion on hypotheses 1a and 1b, this finding should encourage entities affected by the requirements of IFRS 9 to ensure that their analytics personnel are provided with the resources, training and skill development required to stay on top of the changes in the big data credit risk analysis landscape. However, it is also of importance for affected entities to pay attention to the enhancement of governance mechanisms guiding the use of IFRS 9 related big data analytics in affected entities. Data governance has been raised as a key concern in industry analysis on IFRS 9 associated challenges, and this study's finding that industry professionals consider the governance of IFRS 9 data analytical processes an important factor helps to validate these concerns. This finding may promote a practical focus on the governance of data analytics activities particularly within entities affected by IFRS 9.

The partial acceptance of hypothesis 7 contributes to big data analytics capabilities literature as it confirms the association between the dimension and its first order constructs outside of firm performance research. Future endeavours may wish to explore how the hierarchical component model of organisational big data analytics capabilities can be applied in different contexts.

5.2.4 Validity and Reliability of the System Quality Measurement Scales

Research Question 4: What constitutes valid and reliable scales for measuring system quality?

Hypothesis 8: System quality is a multi-dimensional construct and it will be measured by big data characteristics, reliability and integration. (Accepted)

The results of this study indicate that system quality is a multi-dimensional construct which can be measured by big data characteristics, reliability and integration. The constructs of reliability and integration were adapted from empirical studies which have successfully applied the constructs in the measurement of system quality (Nelson et al., 2005; Gable et al., 2008; Hamilton and Chervany, 1981; Bailey and Pearson, 1983; Iivari, 2005; Sedera and Gable, 2004). Big data characteristics was introduced by this study as a measure of system quality and is derived from Fosso et al.'s (2017) big data analytics infrastructure capabilities construct and the 5 'V's' of big data examined in Fosso et al. (2015).

Big data characteristics have a significant positive path coefficient of 0.377 to system quality at significance level 0.05. Reliability has a significant positive path coefficient of 0.299 to system quality at significance level 0.01 and Integration has a significant positive path coefficient of 0.216 to system quality at significance level 0.10. Hence, hypothesis 8 is accepted. Big data characteristics had the highest path coefficient in the system quality hierarchal component model, validating its introduction as a measurement item. This suggests that respondents felt that the big data characteristics of information

systems was a more important factor than the reliability of the system or its ability to integrate data from various sources. Nonetheless, the finding that all three of these first-order constructs had positive and significant path coefficients to system quality demonstrates that this hierarchical component model is reliable and valid.

The validation of the first order constructs big data characteristics, reliability and integration in the system quality hierarchical component model is a valuable finding for the body of knowledge as it demonstrates the validity of these first-order constructs in the context of IFRS 9 implementation. Furthermore, the introduction of the big data characteristics first order construct has proved successful, and the measurement items derived from Fosso et al. (2017) analysis of the five 'V's' of big data turned out to be the most significant factor in the system quality construct. Acceptance of hypothesis 8 contributes to information systems success literature by confirming that DeLone and McLean's (2003) system quality construct can be measured in a hierarchical component model featuring reliability and integration as first-order constructs. Additionally, the development, inclusion and testing of big data characteristics as a supplementary first-order construct in the system quality hierarchical component model contributes to information systems success literature. The determination that big data characteristics have a significant positive path coefficient with system quality proposes that this first order construct may be a valid and reliable measure for system quality which future research may wish to leverage when measuring system quality.

5.2.5 Validity and Reliability of the Information Quality Measurement Scales

Research Question 5: What constitutes valid and reliable scales for measuring information quality?

Hypothesis 9: Information quality is a multi-dimensional construct and it will be measured by currency and accuracy. (Accepted)

In this study, information quality was tested using a hierarchal component model, with the constructs currency and accuracy adopted as first-order constructs. Currency was found to have a significant positive path coefficient of 0.374 to information quality at significance level 0.01. Accuracy was found to have a significant positive path coefficient to information quality also at significance level 0.01. These findings suggest that information quality is a multi-dimensional construct which can be measured by the constructs of currency and accuracy. Therefore, hypothesis 9 is accepted.

Both currency and accuracy have been used in previous research to measure information quality (Nelson et al., 2005; Bailey and Pearson, 1983; Gable et al., 2008; Iivari, 2005; Rainer and Watson, 1995). The acceptance of hypothesis 9 confirms that these two first-order constructs are valid and reliable scales for measuring information quality, now also in the context of IFRS 9 requirements implementation into affected entities. As mentioned in section 5.2.1 when discussing hypotheses 3a and 3b, accuracy had the highest path coefficient of the two first-order constructs of 0.515. This finding implies that industry

professionals associated with IFRS 9 implementation efforts perceive the accuracy of the information systems output to be of more importance than its currency. Notwithstanding, currency of the information system's output is also an important and significant factor in the context, featuring a positive significant path coefficient to information quality.

The determination that both accuracy and currency are significant factors in the information quality hierarchical component model identifies these two characteristics as critical success factors for successful information systems in the context of IFRS 9. This finding may help affected entities to target their attention and resources to ensure the information systems affected by IFRS 9 or future financial regulatory standards produce accurate and current information required for compliance. Acceptance of hypothesis 9 contributes to information systems success literature by confirming that DeLone and McLean's (2003) information quality dimension can be measured in a hierarchical component model using the first order constructs of currency and accuracy in the context of IFRS 9 requirements implementation into affected entities.

5.2.6 Validity and Reliability of the Service Quality Measurement Scales

Research Question 6: What constitutes valid and reliable scales for measuring service quality?

Hypothesis 10: Service quality is a multi-dimensional construct and it will be measured by dependability and assurance. (Partially Accepted)

Due to factor cross loading concerns, the first order construct assurance was removed from the service quality hierarchical component model. Whilst the dependability construct was found to have a positive significant path coefficient of 0.783 to service quality at significance level 0.01; hypothesis 10 is only partially accepted due to the removal of the assurance construct. Due to the potential for confusion with system quality's reliability first order construct, reliability was renamed in the service quality hierarchical component model to dependability.

In extant literature, the reliability construct has been successfully leveraged to measure service quality (Bailey and Pearson, 1983; McKinney et al., 2002; Parasuraman et al., 1991; Gorla et al., 2010). This finding demonstrates that reliability is a valid and reliable scale for measuring service quality in the context of IFRS 9 requirements implementation into the information systems of affected entities. As explored in section 5.2.1 when assessing hypotheses 4a and 4b, future research may wish to examine the influence of service quality on the use of IFRS 9 applications and the perception of continual IFRS 9 compliance after the mandatory compliance date of January 1, 2018, when affected entities are bound to be using such information systems. At that time, future research may wish to reconsider the inclusion of the assurance first order construct, ensuring to review the similarities in this study's wording of the reliability and assurance measurement items to avoid factor cross loading.

The partial acceptance of hypothesis 10 contributes to information systems success literature by confirming that dependability is a valid and reliable measure of service quality. As mentioned, future research may wish to leverage DeLone and McLean's (2003) service quality dimension in studies on information systems success with IFRS 9 requirements at a later stage of deployment when entities have fully moved away from their legacy IAS 39 processes.

5.3 Conclusion

This chapter has discussed the findings of the study through an analysis of the research questions and their corresponding hypotheses. This discussion has explored success factors associated with the implementation of IFRS 9 requirements into the information systems infrastructures of affected entities. The dimensions of organisational big data analytics capabilities, system quality and information quality, were found to have a significant positive impact on the intention of industry professionals associated with affected entities to use IFRS 9 analytics applications. With regard to the attitudes of these industry professionals towards the ability of their entity to comply with the standard, the dimensions of organisational big data analytics capabilities and information quality were found to be significantly positive factors. Furthermore, both intention to use IFRS 9 analytics applications and attitude towards IFRS 9 compliance were found to have a significant positive effect on perceived benefits of IFRS 9 applications.

In summary, the findings of this study suggest that the capability of an entity affected by IFRS 9 to perform big data analytics and utilise an information system capable of producing accurate and current information output are significant compliance success factors. For an entity to ensure that its personnel both intend to use IFRS 9 related analytics applications and be in the position to comply with the requirements of the standard, attention must be focused on the state of big data analytics governance mechanisms and the development of skills, knowledge and experience of its IFRS 9 analytics personnel. Moreover, affected entities must ensure that their information systems are capable of producing information output that accurately reflects the current state of the world it seeks to represent. It was also found that the intention of industry professionals to use IFRS 9 analytics applications and the perception that the standard will be complied with positively affect the perception that IFRS 9 analytics application will benefit the affected entity. This finding demonstrates that IFRS 9 is an important regulatory change which impacts the operations of affected entities and that applications intended to be used to provide analytics for its compliance are perceived by industry professionals to provide strategic, financial and competitive benefits.

The following chapter will outline the theoretical and practical contributions of this research endeavour as well as its implications, limitations and recommendations for future studies.

Chapter 6: Conclusion

6.1 Introduction

This chapter will outline the theoretical and practical contributions of this research undertaking. Following this, an overview of the limitations encountered will be provided along with some recommendations for future research. This chapter will conclude with some final remarks regarding the study.

6.2 Research Contributions

This study contributes to the theory underlying both financial accounting and information systems as well as providing relevant practical contributions to the application and practice of IFRS 9. This has implications for accounting standard setters, vendors providing IFRS 9 information system solutions and professional services firms.

6.2.1 Theoretical Contributions

This study makes several theoretical contributions to the financial accounting and information systems bodies of knowledge. To the best of the author's knowledge, DeLone and McLean's (2003) information system success model has not been implemented in a study on the relationship between evolutions in IFRS standards and the data governance frameworks and big data analytics capabilities of affected entities. As such this study has responded to DeLone and McLean's (2003) call to test their information systems success model in a new context. In a further contribution to information systems success literature, this study has tested the validity and reliability of DeLone and McLean's (2003) system quality, information quality and service quality dimensions when using certain first-order measures.

Secondly, this study contributes to big data analytics capabilities literature by porting the dimension of organisational big data analytics from extant literature into the context of IFRS 9 requirements implementation into affected entities. Until now, the effect of this dimension had only been tested on firm performance (Akter et al., 2016 and Fosso et al., 2017), so this study contributes to big data analytics research by demonstrating its impact on intention to use financial reporting standard analytics applications and the perception that an entity can comply with a new financial reporting standard. This may entice future researchers to test Akter et al.'s (2016) and Fosso et al.'s (2017) big data analytics capability research models in new contexts. Additionally, this study confirms the validity and reliability of the big data analytics capabilities dimension and that it can be used in a hierarchical component model using the first order constructs analytics planning, analytics governance and analytics personnel capabilities.

This study contributes theoretically through its extension of DeLone and McLean's (2003) information systems success model. The introduction, testing and validation of Akter et al.'s (2016) and Fosso et al.'s

(2017) organisational big data analytics dimension as an independent dimension alongside the original information systems qualities as well as the developed concept of attitudes towards IFRS 9 compliance demonstrates that the DeLone and McLean (2003) information systems success model can be adapted to fit the context it is intended to be leveraged to examine through the inclusion of new dimensions. This takes into account DeLone and McLean's (2003) recommendation to ensure that the context of the research is appropriate for use of information systems success model.

This study also demonstrates that the R software environment for statistical computing and graphics (R Core Team, 2007) can be used to analyse descriptive results of empirical studies. The use of the R environment in this study demonstrates that some aspects of empirical research do not require the use of expensive statistical software applications. Researchers from across the world, particularly in developing countries, may wish to use this study as an example of how to use R to compute descriptive statistics. The inclusion of the R console logs in the appendix of this study may allow researchers to understand how the programming environment can be used to obtain desired results. Furthermore, this study demonstrates that Smart PLS (Ringle et al., 2015) is a valid software application for design and calculation of SEM-PLS models.

Above all else, this study contributes to both financial accounting and information systems research by addressing the failure of extant literature to specifically examine the influence of evolutions in IFRS standard setting on the data governance frameworks and big data analytics capabilities of affected entities. The need to explore these literature gaps is made evident due to the scale and scope of the IFRS 9 phenomenon and the inability of entities and actors affected by the standard to turn to empirical academic literature to understand how to address the impact of the standard on their information systems infrastructures, particularly their data governance mechanisms and approaches to big data analytics.

6.2.2 Practical Contributions

From a practical perspective, the findings of this study may help entities affected by IFRS 9 to allocate their resources efficiently. The determination that organisational big data analytics capabilities and information systems output which accurately describes the current state of the world it represents are significant factors for a successful implementation of IFRS 9 requirements into affected entities may encourage entities to review their data governance mechanisms and attitude towards development of analytics personnel's skills, experience and knowledge.

Moreover, it has been demonstrated that intended use of IFRS 9 analytics applications is perceived by industry professionals to benefit affected entities strategically, financially, functionally and competitively. This highlights the importance of these applications to the affected entities and may promote awareness within the entities of this fact. This may arise through increased investment and attention provided to the

IFRS 9 requirements implementation projects. Industry may also benefit from this study's finding that industry professional's perception that an entity will comply with IFRS 9 positively affects the perception that affected entities will benefit from IFRS 9 application use. This may remind stakeholders within affected entities that the standard is perceived to be a beneficial and positive change.

The findings of this study may encourage international accounting standard setters, such as the IASB, to further consider the impact of standard setting on the IT architectures of affected entities. For example, this study's finding that big data analytics capabilities are an important success factor in the implementation of IFRS 9 requirements may promote international accounting standard setters to consider the ability of entities affected by their standard setting to govern the big data analytics required to comply. Entities of different sizes will vary in their ability to invest in big data analytics and as such international standard setters may benefit from this study and be in the position to tailor future standards accordingly.

Additionally, the descriptive analysis findings of this study may benefit affected entities, standard setters and professional services firms. For example, the knowledge that the majority of participants in this study were educated to the postgraduate level may indicate to entities the type of human resources their competitors are leveraging to be successful in their IFRS 9 requirements implementation endeavours. The analysis of which vendors entities are using to help implement the standard could benefit vendors and professional services firms understand the landscape relevant to technological capability development in preparation to comply.

6.3 Limitations and Recommendations for Future Research

This study is limited by several factors. Firstly, the study's low response rate limits the statistical power of the findings. This problem was encountered most likely due to the distribution of the survey across the internet as opposed to more direct means. Another possible reason relates to the presence of professional services firm consultants and recruiters in the member lists of the selected LinkedIn IFRS 9 implementation groups. Future research may wish to complement this study's adoption of LinkedIn survey questionnaire invitation distribution with in person, mail or telephone interactions with potential participants which may increase sample sizes. Should future research wish to implement a similar LinkedIn population sample, a more selective survey invitation process should be utilised rather than the blanket invitations sent as a part of this study.

Most participants in the study held financial, managerial or risk related job positions, with only 3.74% holding positions directly relating to IT. This is a limitation of the study as it prevented a deep investigation into how the technical characteristics of the information systems supporting IFRS 9 analytics applications impacted upon the intention to use these applications and attitudes towards compliance with the standard. These characteristics would have been captured in DeLone and McLean's (2003) system quality

dimension, and this limitation may have been the reason for which hypotheses 2a and 2b were not accepted. Future research may wish to focus attention on IT professionals associated with entities affected by evolutions in IFRS.

Another limitation of the study relates to the discussion on the information systems solutions of IFRS 9 associated vendors adopted by affected entities, specifically those identified in the Chartis Resrearch (2016) IFRS 9 technology oslutions report. These vendors include AxiomSL; Fernbach, FIS, Misys, Moody's Analytics, Oracle, Prometeia, Quantifi, SAP, SAS and Wolters Kluwer FS. It is likely that the solution selected by an affected entity would impact upon the outcome of the study, and as a result it is encouraged that future research endeavours utilise this aspect as a control variable.

A fourth limitation is associated with the timing of this study relative to the stage at which entities affected by IFRS 9 are with the implementation of the standard's requirements into their operational and information systems infrastructures. This is a pre-compliance study, which aimed to identify success factors and challenges associated with compliance with a standard before compliance was mandatory. As a result, these success factors may be more associated with pre-compliance stages of IFRS 9 requirements implementation rather than post compliance stages.

Nonetheless, this study contributes to both academia and industry as it is inevitable that entities are to be faced with future financial accounting standards which impact their information systems, particularly as the IFRS 9 ECL model is not without its own problems (Camfferman, 2015). Future research, however, may wish to reapply this study's research model after January 1, 2018, when entities are required to produce financial reporting statements which comply with IFRS 9. The findings of future research of this nature can then perhaps be compared with this study's findings to determine how success factors and the relationship between this study's structural model dimensions differ after mandatory compliance is enforced.

6.4 Concluding Remarks

The GFC inflicted widespread damage to the world economy. Some blamed the financial accounting standards in effect at the time, such as IAS 39, for causing the crisis by overstating financial asset values and restricting the recognition of financial instrument credit losses (Camfferman, 2015). In response, the IASB introduced a new financial reporting standard, IFRS 9, featuring an expected credit loss model that aimed to benefit users of financial statements by providing more information about an entity's future cash flows (International Accounting Standards Board, 2014, para 1.1). Industry analysis has suggested that this standard's requirements are causing significant challenges for affected entities, particularly regarding their data asset governance and capabilities to perform big data analytics.

This study has sought to contribute to the underlying theory of financial accounting and information systems by addressing a gap in the extant literature that specifically focuses on the relationship between evolutions in IFRS standard setting and the data governance frameworks and big data analytics capabilities of affected entities. It is hoped that the findings of this study will help affected entities to navigate the challenges associated with the need to comply with the requirements of IFRS 9 by providing an empirical academic resource to which they can refer to and learn from. The findings of this study may help to address the challenges of not only IFRS 9 but perhaps future financial accounting standards which impact upon the information systems infrastructures of affected entities in a similar manner.

It has taken time for financial reporting standards to respond to the GFC. The successful implementation of IFRS 9 is crucial to this response. Yet the mere fact that the standard exists does not guarantee that the outcomes sought by international accounting standard setters are achieved. What is necessary is a combination of organisational big data analytics capabilities and high-quality information systems output within organisations to enable a smooth and efficient application of the particulars of the IFRS 9. This study has identified these and other related success factors and provides insight into how the standard may be successfully implemented.

Reference List

Akter, S., Fosso Wamba, S., Gunasekaran, A., Dubey, R., & Childe, S. J. (2016). How to improve firm performance using big data analytics capability and business strategy alignment? *International Journal of Production Economics, 182*, 113-131.

Alexander, C. R., Bauguess, S. W., Bernile, G., Lee, Y.-H. A., & Marietta-Westberg, J. (2013). Economic effects of SOX Section 404 compliance: A corporate insider perspective. *Journal of Accounting and Economics, 56*(2), 267-290.

Almutairi, H., & Subramanian, G. H. (2005). An empirical application of the DeLone and McLean model in the Kuwaiti private sector. *Journal of Computer Information Systems, 45*(3), 113-122.

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International journal of social research methodology, 8*(1), 19-32.

ASX Corporate Governance Council. (2014). *Corporate governance principles and recommendations.* Retrieved from www.asx.com.au/documents/asx.../cgc-principles-and-recommendations-3rd-edn.pdf

Atkinson, T., Luttrell, D., & Rosenblum, H. (2013). How bad was it? The costs and consequences of the 2007–09 financial crisis. *Federal Reserve Bank of Dallas Staff Papers*(July).

Australian Business Deans Council. (2017). Master Journal List - Australian Business Deans Council. Retrieved from http://www.abdc.edu.au/master-journal-list.php

Australian Research Council. (2007). *National Statement on Ethical Conduct in Human Research*. Retrieved from https://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72_national_statement_may_2015_150514_a.pdf

Bailey, J. E., & Pearson, S. W. (1983). Development of a tool for measuring and analyzing computer user satisfaction. *Management science, 29*(5), 530-545.

Barki, H., & Huff, S. L. (1985). Change, attitude to change, and decision support system success. *Information & Management, 9*(5), 261-268.

BDO IFR Advisory Limited. (2014). *NEED TO KNOW: IFRS 9 Financial Instruments - Impairment of Financial Assets*. Retrieved from www.bdo.global%2Fgetattachment%2FServices%2FAudit-Assurance%2FIFRS%2FNeed-to-Know%2FNTK_IFRS9_print-(1).pdf

Begg, C., & Caira, T. (2012). Exploring the SME Quandary: Data Governance in Practise in the Small to Medium-Sized Enterprise Sector. *Electronic Journal of Information Systems Evaluation, 15*(1), 3-13.

Bernhardt, T., Erlinger, D., & Unterrainer, L. (2014). IFRS 9: The new rules for hedge accounting from the risk management's perspective. *ACRN Journal of Finance and Risk Perspectives, 3*(3), 53-66.

Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: an empirical investigation. *MIS quarterly*, *24*(1), 169-196.

Birindelli, G., & Ferretti, P. (2008). Compliance risk in Italian banks: the results of a survey. *Journal of Financial Regulation and Compliance, 16*(4), 335-351.

Bischof, J., & Daske, H. (2016). Interpreting the European Union's IFRS endorsement criteria: The case of IFRS 9. *Accounting in Europe, 13*(2), 129-168.

Bitly, I. (2017). bit.ly. New York, New York: Bitly, Inc. Retrieved from https://app.bitly.com/

Bivand, R. (2017). maptools: Tools for Reading and Handling Spatial Objects Version 0.9-2. Retrieved from https://CRAN.R-project.org/package=maptools

Bonollo, M., & Neri, M. (2012). Data quality in banking: Regulatory requirements and best practices. *Journal of Risk Management in Financial Institutions, 5*(2), 146-161.

Bose, R. (2009). Advanced analytics: opportunities and challenges. *Industrial Management & Data Systems, 109*(2), 155-172.

Camfferman, K. (2015). The emergence of the 'incurred-loss' model for credit losses in IAS 39. *Accounting in Europe, 12*(1), 1-35.

Cappiello, C., Francalanci, C., & Pernici, B. (2003). Time-related factors of data quality in multichannel information systems. *Journal of management information systems, 20*(3), 71-92.

Chamisa, E. E. (2000). The relevance and observance of the IASC standards in developing countries and the particular case of Zimbabwe. *The International Journal of Accounting, 35*(2), 267-286.

Chand, P., & Patel, C. (2008). Convergence and harmonization of accounting standards in the South Pacific region. *Advances in Accounting, 24*(1), 83-92.

Chartis Research. (2016). *IFRS 9 Technology Solutions 2016*. Retrieved from http://www.pwc.com/m1/en/publications/ifrs-9-lite-middle-east-final.pdf

Chin, W. W. (1998). Issues and Opinion on Structural Equation Modeling. *MIS quarterly, 22*(1), vii - xvi.

Chin, W. W. (2010). How to write up and report PLS analyses. In V. Esposito Vinzi, J. Henseler, W. Chin, & H. Wang (Eds.), *Handbook of partial least squares* (pp. 655-690). Berlin: Springer.

Chin, W. W., & Gopal, A. (1995). Adoption intention in GSS: relative importance of beliefs. *ACM Sigmis Database, 26*(2-3), 42-64.

Chin, W. W., & Newsted, P. R. (1999). Structural equation modeling analysis with small samples using partial least squares. *Statistical strategies for small sample research, 1*(1), 307-341.

Choe, J.-M. (1996). The relationships among performance of accounting information systems, influence factors, and evolution level of information systems. *Journal of management information systems, 12*(4), 215-239.

Cohen, J. (1988). *Statistical Power Analysis for Behavioural Sciences* (Second Edition ed.). Hillsdale: Lawrence Erlbaum Associates.

Cohen, J. (1992). A power primer. *Psychological bulletin, 112*(1), 155.

Cronbach, L. (1971). Educational measurement. In R. L. Thorndike & W. H. Angoff (Eds.), (Second ed.). Washington D.C.: American Council on Education.

D'Ambra, J., & Rice, R. E. (2001). Emerging factors in user evaluation of the World Wide Web. *Information & Management, 38*(6), 373-384.

Daske, H., Hail, L., Leuz, C., & Verdi, R. (2008). Mandatory IFRS reporting around the world: Early evidence on the economic consequences. *Journal of accounting research, 46*(5), 1085-1142.

Davenport, T. H., Barth, P., & Bean, R. (2012). How big data is different. *MIT Sloan Management Review, 54*(1), 43.

Deloitte. (2014). *Fourth Global IFRS Banking Study - Ready to Land*. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/ch/Documents/financial-services/ch-en-financial-services-ifrs-fourth-global-banking-survey.pdf

Deloitte. (2015). *Fifth Global IFRS Banking Study - Finding Your Way*. Retrieved from https://www2.deloitte.com/.../Deloitte/global/.../gx-fsi-fifth-banking-ifrs-survey-full.pdf

Deloitte. (2016). *Sixth Global IFRS Banking Study- No time like the present*. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Financial-Services/gx-fsi-sixth-ifrs-banking-survey.pdf

DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information systems research, 3*(1), 60-95.

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of management information systems, 19*(4), 9-30.

Dolphin, T., & Chappell, L. (2010). *The Effect of the Global Financial Crisis on Emerging and Developing Economies*. Retrieved from

https://www.ippr.org/files/images/media/files/publication/2011/05/Financial%20crisis%20and%20developing%20economies%20Sep%202010_1798.pdf

Doupnik, T. S., & Richter, M. (2003). Interpretation of uncertainty expressions: a cross-national study. *Accounting, Organizations and Society, 28*(1), 15-35.

Doupnik, T. S., & Richter, M. (2004). The impact of culture on the interpretation of "in context" verbal probability expressions. *Journal of International Accounting Research, 3*(1), 1-20.

Duarte, P. A. O., & Raposo, M. L. B. (2010). A PLS Model to Study Brand Preference: An Application to the Mobile Phone Market. In V. Esposito Vinzi, J. Henseler, W. Chin, & H. Wang (Eds.), *Handbook of partial least squares* (pp. 449-485). Berlin: Springer.

EBSCO Industries Incorporated. (2017). Business Source Premier | Business Magazines and Journals | EBSCO. Retrieved from https://www.ebsco.com/products/research-databases/business-source-premier

Elsevier. (2017a). ScienceDirect.com | Science, health and medical journals, full text articles and books. Retrieved from http://www.sciencedirect.com/

Elsevier. (2017b). Scopus preview - Scopus - Welcome to Scopus. Retrieved from https://www.scopus.com/

Emerald Publishing Limited. (2017). Emearld Insight. Retrieved from http://www.emeraldinsight.com/

Emmanuel Iatridis, G. (2012). Voluntary IFRS disclosures: evidence from the transition from UK GAAP to IFRSs. *Managerial Auditing Journal, 27*(6), 573-597.

Ernst and Young. (2014). *Impairment of financial instruments under IFRS 9*. Retrieved from http://www.ey.com/Publication/vwLUAssets/Applying_IFRS:_Impairment_of_financial_instruments_under_IFRS_9/$FILE/Apply-FI-Dec2014.pdf

Ernst and Young. (2015). IFRS 9 deferred for insurers and further progress on participating insurance contracts. *Insurance Accounting Alert, September 2015*. Retrieved from http://www.ey.com/Publication/vwLUAssets/EY-ifrs-9-deferred-for-insurers-and-further-progress-on-participating-insurance-contracts/$FILE/EY-ifrs-9-deferred-for-insurers-and-further-progress-on-participating-insurance-contracts.pdf

Ernst and Young. (2016). *EY IFRS 9 Impairment Banking Survey*. Retrieved from http://www.ey.com/Publication/vwLUAssets/ey-ifrs-9-impairment-banking-survey-september-2016/$FILE/ey-ifrs-9-impairment-banking-survey-september-2016.pdf

Ernst and Young. (2017). *EY IFRS 9 Impairment Banking Survey*. Retrieved from http://www.ey.com/Publication/vwLUAssets/ey-ifrs-9-impairment-banking-survey-new/$FILE/ey-ifrs-9-impairment-banking-survey.pdf

European Banking Authority. (2016). *Report on results from the EBA impact assessment of IFRS 9*. Retrieved from https://www.eba.europa.eu/documents/10180/1360107/EBA+Report+on+impact+assessment+of+IFRS9

European Banking Authority. (2017). *Report on results from the second EBA impact assessment of IFRS 9*. Retrieved from https://www.eba.europa.eu/documents/10180/1720738/EBA+Report+on+results+from+the+2nd+EBA+IFRS9+IA.pdf

Everitt, B. S., & Hothorn, T. (2006). *A Handbook of Statistical Analytics Using R*. Florida: Chapman & Hall/CRC.

Falissard, B. (2012). psy: Various procedures used in psychometry. R package version 1.1. Retrieved from https://CRAN.R-project.org/package=psy

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior research methods, 39*(2), 175-191.

Financial Stability Forum. (2008). *Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience*. Retrieved from http://www.fsb.org/wp-content/uploads/r_0804.pdf?page_moved=1

Firoz, C. M., Ansari, A. A., & Akhtar, K. (2011). IFRS–impact on Indian banking industry. *International Journal of Business and Management, 6*(3), 277.

Fosso Wamba, S., Akter, S., Edwards, A., Chopin, G., & Gnanzou, D. (2015). How 'big data'can make big impact: Findings from a systematic review and a longitudinal case study. *International Journal of Production Economics, 165*, 234-246.

Fosso Wamba, S., Gunasekaran, A., Akter, S., Ren, S. J.-f., Dubey, R., & Childe, S. J. (2017). Big data analytics and firm performance: Effects of dynamic capabilities. *Journal of Business Research, 70*, 356-365.

G20. (2009). *London Summit - Leader's Statement 2 April 2009*. Retrieved from https://www.g20.org/Content/DE/StatischeSeiten/Breg/G7G20/Anlagen/G20-erklaerung-london-en.pdf?__blob=publicationFile&v=1

Gable, G. G., Sedera, D., & Chan, T. (2008). Re-conceptualizing information system success: The IS-impact measurement model. *Journal of the Association for Information Systems, 9*(7), 377.

Gandomi, A., & Haider, M. (2015). Beyond the hype: Big data concepts, methods, and analytics. *International Journal of Information Management, 35*(2), 137-144.

Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika, 61*(1), 101-107.

Gill, T. G. (1995). Early expert systems: Where are they now? *MIS quarterly*, *19*(1), 51-81.

GitHub Incorporated. (2017). The world's leading software development platform. GitHub. Retrieved from https://github.com/

Global Public Policy Committee. (2016). *The implementation of IFRS 9 impairment requirements by banks*. Retrieved from http://www.ey.com/Publication/vwLUAssets/Implementation_of_IFRS_9_impairment_requirements_by_systemically_important_banks/$File/BCM-FIImpair-GPPC-June2016%20int.pdf

Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. *MIS quarterly*, *19*(2), 213-236.

Gorla, N., Somers, T. M., & Wong, B. (2010). Organizational impact of system quality, information quality, and service quality. *The Journal of Strategic Information Systems, 19*(3), 207-228.

Grabski, S. V., Leech, S. A., & Schmidt, P. J. (2011). A review of ERP research: A future agenda for accounting information systems. *Journal of information systems, 25*(1), 37-78.

Guimaraes, T., & Igbaria, M. (1997). Client/server system success: Exploring the human side. *Decision Sciences, 28*(4), 851-876.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). *A Primer on Partial Least Squares Structural Equation Modeling (SEM-PLS)*. Thousand Oaks, California: SAGE Publications, Inc.

Halawi, L. A., McCarthy, R. V., & Aronson, J. E. (2007). An empirical investigation of knowledge management systems' success. *Journal of Computer Information Systems, 48*(2), 121-135.

Hamilton, S., & Chervany, N. L. (1981). Evaluating information system effectiveness-Part I: Comparing evaluation approaches. *MIS quarterly*, *5*(3), 55-69.

Hansmann, K.-W., & Ringle, C. M. (2004). SmartPLS manual. *University of Hamburg, Hamburg*, 4-21.

Hronsky, J. J., & Houghton, K. A. (2001). The meaning of a defined accounting concept: Regulatory changes and the effect on auditor decision making. *Accounting, Organizations and Society, 26*(2), 123-139.

Huwe, T. K. (2012). Big data, big future. *Computers in libraries, 32*(5), 20-22.

IBM Corporation. (2016). IBM SPSS Statistics for Windows (Version 24). Armonk, NY: IBM Corporation.

IFRS Foundation. (2014). *IFRS 9: A Complete Package for Investors*. Retrieved from http://www.ifrs.org/-/media/feature/resources-for/investors/investor-perspectives/investor-perspective-jul-2014.pdf

Iivari, J. (2005). An empirical test of the DeLone-McLean model of information system success. *ACM Sigmis Database, 36*(2), 8-27.

Inc., B. M. (2012). *The Cost of the Wall Street-Caused Financial Collapse and Ongoing Economic Crisis is More Than $12.8 Trillion*. Retrieved from https://bettermarkets.com/sites/default/files/Cost%20Of%20The%20Crisis_2.pdf

International Accounting Standards Board. (2005). International Accounting Standard 32: Financial Instruments: Presentation. Retrieved from http://eifrs.ifrs.org/eifrs/bnstandards/en/IAS32.pdf

International Accounting Standards Board. (2010). *The Conceptual Framework for Financial Reporting*. Retrieved from http://eifrs.ifrs.org/eifrs/PdfAlone?id=16031&sidebarOption=UnaccompaniedConceptual

International Accounting Standards Board. (2014). *International Financial Reporting Standard 9: FInancial Instruments*. Retrieved from http://eifrs.ifrs.org/eifrs/PdfAlone?id=16040&sidebarOption=UnaccompaniedIfrs

International Monetary Fund. (2009). *Balance of Payments and international Investment Position Manual* (Sixth Edition ed.): International Monetary Fund.

Ives, B., Olson, M. H., & Baroudi, J. J. (1983). The measurement of user information satisfaction. *Communications of the ACM, 26*(10), 785-793.

Jermakowicz, E. K., & Gornik-Tomaszewski, S. (2006). Implementing IFRS from the perspective of EU publicly traded companies. *Journal of International Accounting, Auditing and Taxation, 15*(2), 170-196.

Keen, P. G. (1980). MIS research: reference disciplines and a cumulative tradition. *ICIS 1980 Proceedings.* 9.

Keyes, O. (2016). lucr: Currency Formatting and Conversion Version 0.2.0. Retrieved from https://CRAN.R-project.org/package=lucr

Khatri, V. (2016). Managerial work in the realm of the digital universe: The role of the data triad. *Business Horizons, 59*(6), 673-688.

Khatri, V., & Brown, C. V. (2010). Designing data governance. *Communications of the ACM, 53*(1), 148-152.

Kim, G., Shin, B., & Kwon, O. (2012). Investigating the value of sociomaterialism in conceptualizing IT capability of a firm. *Journal of management information systems, 29*(3), 327-362.

Kiron, D., Prentice, P. K., & Ferguson, R. B. (2014). The analytics mandate. *MIT Sloan Management Review, 55*(4), 1.

Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling* (Third ed.). New York, New York: The Guildford Press.

Knežević, G., Pavlović, V., & Vukadinović, P. (2015). Ifrs 9 and implications of "business model vs. Management intent" criteria on the quality of accounting information. *FINIZ 2015-Contemporary Financial Management*, 22-26.

Kooper, M. N., Maes, R., & Lindgreen, E. R. (2011). On the governance of information: Introducing a new concept of governance to support the management of information. *International Journal of Information Management, 31*(3), 195-200.

KPMG. (2016). *Amendments to IFRS 4: Applying IFRS 9 Financial Instruments with IFRS 4 Insurance Contracts*. Retrieved from https://home.kpmg.com/content/dam/kpmg/xx/pdf/2016/09/ifrs4-amendments-applying-ifrs9-differing-effective-dates.pdf

KPMG IFRG Limited. (2006). *Insights into IFRS: KPMG's practical guide to International Financial Reporting Standards* (Vol. 3). London: Thomson.

Krishnamurthy, R., & Desouza, K. C. (2014). Big data analytics: The case of the social security administration. *Information Polity, 19*(3, 4), 165-178.

Larson, R. K., & Street, D. L. (2004). Convergence with IFRS in an expanding Europe: progress and obstacles identified by large accounting firms' survey. *Journal of International Accounting, Auditing and Taxation, 13*(2), 89-119.

Li, Y., Thomas, M. A., & Osei-Bryson, K.-M. (2016). A snail shell process model for knowledge discovery via data analytics. *Decision Support Systems, 91*, 1-12.

LinkedIn. (2017a). Groups - Overview. Retrieved from https://www.linkedin.com/help/linkedin/answer/1164/groups-overview?lang=en

LinkedIn. (2017b). Finding and Joining a Group. Retrieved from https://www.linkedin.com/help/linkedin/answer/186

LinkedIn. (2017c). Inviting or Connecting with People on LinkedIn. Retrieved from https://www.linkedin.com/help/linkedin/answer/118/inviting-or-connecting-with-people-on-linkedin?lang=en

LinkedIn. (2017d). Personalizing Invitations to Connect. Retrieved from https://www.linkedin.com/help/linkedin/answer/46662?query=invitation%20to%20connect

LinkedIn. (2017e). Email Address Needed for an Invitation. Retrieved from https://www.linkedin.com/help/linkedin/answer/1239?query=email%20to%20connect

LinkedIn. (2017f). Accessing Your Account Data. Retrieved from https://www.linkedin.com/help/linkedin/answer/50191?query=download%20data

Mahmood, M. A., & Soon, S. K. (1991). A comprehensive model for measuring the potential impact of information technology on organizational strategic variables. *Decision Sciences, 22*(4), 869-897.

Malik, P. (2013). Governing big data: principles and practices. *IBM Journal of Research and Development, 57*(3/4), 1: 1-1: 13.

Massaro, M., Dumay, J., & Guthrie, J. (2016). On the shoulders of giants: undertaking a structured literature review in accounting. *Accounting, Auditing & Accountability Journal, 29*(5), 767-801.

Matheson, T. (2013). The global financial crisis: an anatomy of global growth. IMF Working Paper No. 13/76. Retrieved from https://ssrn.com/abstract=2260097

Mawanane-Hewa. S. I. (2016), Interest group influence on the development of International Financial Reporting Standard (IFRS) 9, Financial Instruments (Masters Thesis, Macquarie University, Australia). Retrieved from http://hdl.handle.net/1959.14/1250542.

McAfee, A., & Brynjolfsson, E. (2012). Big Data: The Management Revolution. *Harvard Business Review, 90*(10), 61-67.

McKinney, V., Yoon, K., & Zahedi, F. M. (2002). The measurement of web-customer satisfaction: An expectation and disconfirmation approach. *Information systems research, 13*(3), 296-315.

Meijer, E. (2012). Your mouse is a database. *Queue, 10*(3), 20.

Moody's Analytics. (2016). IFRS 9 Survey Results. *Risk Perspectives, 7*(June 2016). Retrieved from https://www.moodysanalytics.com/risk-perspectives-magazine/risk-finance-accounting-converge

Moody's Analytics. (2017). Transitioning to Big Data Architecture. © 2017 Moody's Investors Service, Inc. and/or its licensors and affiliates, including Moody's Analytics, Inc. Reprinted with permission. All Rights Reserved.

Nelson, R. R., Todd, P. A., & Wixom, B. H. (2005). Antecedents of information and system quality: an empirical examination within the context of data warehousing. *Journal of management information systems, 21*(4), 199-235.

Novotny-Farkas, Z. (2016). The interaction of the IFRS 9 expected loss approach with supervisory rules and implications for financial stability. *Accounting in Europe, 13*(2), 197-227.

Onali, E., & Ginesti, G. (2014). Pre-adoption market reaction to IFRS 9: A cross-country event-study. *Journal of Accounting and Public Policy, 33*(6), 628-637.

Otto, B. (2011). Organizing data governance: findings from the telecommunications industry and consequences for large service providers. *Communications of the Association for Information Systems, 29*(3), 45-66.

Otto, B. (2012). How to design the master data architecture: Findings from a case study at Bosch. *International Journal of Information Management, 32*(4), 337-346.

Owrang, M., & Grupe, F. H. (1997). Database tools to acquire knowledge for rule-based expert systems. *Information and Software Technology, 39*(9), 607-616.

Pacter, P. (2016). *Pocket Guide to IFRS Standards: the global financial reporting language*. Retrieved from www.ifrs.org/Use-around-the-world/Documents/2016-pocket-guide.pdf

Palczewska, A., Fu, X., Trundle, P., Yang, L., Neagu, D., Ridley, M., & Travis, K. (2013). Towards model governance in predictive toxicology. *International Journal of Information Management, 33*(3), 567-582.

Pallant, J. (2005). *SPSS Survival manual* (Second Edition ed.). Australia: Allen & Unwin.

Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1991). Refinement and reassessment of the SERVQUAL scale. *Journal of retailing, 67*(4), 420.

Peng, S., & Bewley, K. (2010). Adaptability to fair value accounting in an emerging economy: A case study of China's IFRS convergence. *Accounting, Auditing & Accountability Journal, 23*(8), 982-1011.

Petter, S., DeLone, W., & McLean, E. (2008). Measuring information systems success: models, dimensions, measures, and interrelationships. *European journal of information systems, 17*(3), 236-263.

Petticrew, M., & Roberts, H. (2008). *Systematic reviews in the social sciences: A practical guide*: John Wiley & Sons.

Pitt, L. F., Watson, R. T., & Kavan, C. B. (1995). Service quality: a measure of information systems effectiveness. *MIS quarterly*, *19*(2), 173-187.

PricewaterhouseCoopers LLC. (2012). *Manual of Accounting: IFRS 2013* (Vol. 1). Haywards Heath: Bloomsbury Professional.

Prorokowski, L., & Prorokowski, H. (2015). Solutions for risk data compliance under BCBS 239. *Journal of Investment Compliance, 16*(4), 66-77.

Psaros, J., & Trotman, K. T. (2004). The impact of the type of accounting standards on preparers' judgements. *Abacus, 40*(1), 76-93.

PwC. (2017). *IFRS 9, Financial Instruments Understanding the basics*. Retrieved from http://www.pwc.com/gx/en/audit-services/ifrs/publications/ifrs-9/ifrs-9-understanding-the-basics.pdf

Qualtrics. (2017). Qualtrics, (Version July, 2017). Provo, Utah, USA. Retrieved from http://www.qualtrics.com

R Core Team. (2017). R: A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from https://www.R-project.org

Rai, A., Lang, S. S., & Welker, R. B. (2002). Assessing the validity of IS success models: An empirical test and theoretical analysis. *Information Systems Research, 13*(1), 50-69.

Rainer Jr, R. K., & Watson, H. J. (1995). The keys to executive information system success. *Journal of Management Information Systems, 12*(2), 83-98.

Ramanna, K. (2013). The international politics of IFRS harmonization. *Accounting, Economics and Law, 3*(2), 1-46.

Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Research in Marketing, 26*(4), 332-344.

Revelle, W. (2017). psych: Procedures for Psychological, Psychometric, and Personality Research Version 1.7.8. Retrieved from https://CRAN.R-project.org/package=psych

Riggins, F. J., & Klamm, B. K. (2017). Data governance case at KrauseMcMahon LLP in an era of self-service BI and Big Data. *Journal of Accounting Education, 38,* 23-36.

Ringle, C. M., Da Silva, D., & Bido, D. d. S. (2014). Structural equation modeling with the Smartpls. *Brazilian Journal of Marketing, 13*(2), 56-73.

Ringle, C. M., Wende, S., & Becker, J.-M. (2015). SmartPLS 3: SmartPLS GmbH. Retrieved from http://www.smartpls.com

Sadiq, S., & Indulska, M. (2017). Open data: Quality over quantity. *International Journal of Information Management, 37*(3), 150-154.

Schultz, J. J., & Lopez, T. J. (2001). The impact of national influence on accounting estimates: Implications for international accounting standard-setters. *The International Journal of Accounting, 36*(3), 271-290.

Schumacker, R. E., & Lomax, R. G. (2004). *A Beginner's Guide to Structural Equation Modeling* (Second Edition ed.). Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.

Scimago Lab. (2017). Scimago Journal & Country Rank. Retrieved from http://www.scimagojr.com/

Seddon, P., & Kiew, M.-Y. (1996). A partial test and development of DeLone and McLean's model of IS success. *Australasian Journal of Information Systems, 4*(1), 90-109.

Seddon, P. B. (1997). A respecification and extension of the DeLone and McLean model of IS success. *Information systems research, 8*(3), 240-253.

Sedenberg, E. M., & Mulligan, D. K. (2015). Public Health as a Model for Cybersecurity Information Sharing. *Berkeley Tech. LJ, 30*, 1687.

Sedera, D., & Gable, G. (2004). A factor and structural equation analysis of the enterprise systems success measurement model. *ICIS 2004 Proceedings*, 36.

Shan, Y. G., & Troshani, I. (2016). The effect of mandatory XBRL and IFRS adoption on audit fees: Evidence from the Shanghai Stock Exchange. *International Journal of Managerial Finance, 12*(2), 109-135.

Shields, K. (2014). International Accounting Standard Setting: Lobbying and the Development of Financial Instruments Accounting (Doctoral thesis, University of Leeds). Retrieved from http://etheses.whiterose.ac.uk/7904/.

Soderstrom, N. S., & Sun, K. J. (2007). IFRS adoption and accounting quality: a review. *European Accounting Review, 16*(4), 675-702.

Stead, C. (2017). dfCurrencyConvert: An R Package for Converting Multiple Currency Values Version 0.9000. Retrieved from https://github.com/connorstead/dfCurrencyConvert

Stone, M. (1974). Cross-validatory choice and assessment of statistical predictions. *Journal of the royal statistical society. Series B (Methodological)*, 111-147.

Taipaleenmäki, J., & Ikäheimo, S. (2013). On the convergence of management accounting and financial accounting–the role of information technology in accounting change. *International Journal of Accounting Information Systems, 14*(4), 321-348.

Tallon, P. P. (2013). Corporate governance of big data: Perspectives on value, risk, and cost. *Computer, 46*(6), 32-38.

Temme, D., Kreis, H., & Hildebrandt, L. (2010). A Comparison of Current PLS path Modeling Software: Features, Ease-of-Use, and Performance. In V. Esposito Vinzi, J. Henseler, W. Chin, & H. Wang (Eds.), *Handbook of partial least squares* (pp. 737-756). Berlin: Springer.

The Apache Software Foundation. (2017a). Apache Spark - Lightning-Fast Cluster Computing. Retrieved from https://spark.apache.org/

The Apache Software Foundation. (2017b). Welcome to Apache Hadoop!. Retrieved from http://hadoop.apache.org/#What+Is+Apache+Hadoop%3F

The JabRef Team. (2017). JabRef (Version 3.8.2): The JabRef Team. Retrieved from http://www.jabref.org/

The R Foundation. (2017). What is R? Retrieved from https://www.r-project.org/about.html

The World Bank Group. (2009). Data & Research - The Economic Crisis and the Millennium Development Goals. Retrieved from http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/0,,contentMDK:22154703~pagePK:64165401~piPK:64165026~theSitePK:469372,00.html

Thompson, N., Ravindran, R., & Nicosia, S. (2015). Government data does not mean data governance: Lessons learned from a public sector application audit. *Government Information Quarterly, 32*(3), 316-322.

Tower, I., & Impavido, G. (2009). *How the financial crisis affects pensions and insurance and why the impacts matter*: International Monetary Fund. Retrieved from https://www.imf.org/~/media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/wp/2009/_wp09151.ashx

Tran, H., Zdun, U., Oberortner, E., Mulo, E., & Dustdar, S. (2012). Compliance in service-oriented architectures: A model-driven and view-based approach. *Information and Software Technology, 54*(6), 531-552.

Urbach N., Müller B. (2012) The Updated DeLone and McLean Model of Information Systems Success. In: Dwivedi Y., Wade M., Schneberger S. (eds) Information Systems Theory. Integrated Series in Information Systems, vol 28. Springer, New York, NY

Urbach, N., Smolnik, S., & Riempp, G. (2009). The state of research on information systems success. *Business & Information Systems Engineering, 1*(4), 315-325.

Van der Tas, L. G. (1988). Measuring harmonisation of financial reporting practice. *Accounting and business research, 18*(70), 157-169.

Vatanasakdakul, S. (2007). An investigation of the appropriateness of internet technology for inter-firm communication in the Thai tourism industry. *Unpublished Doctoral Dissertation, University of New South Wales, Sydney, Australia*.

Vatanasakdakul, S., & D'Ambra, J. (2007). A conceptual model for e-commerce adoption in developing countries: a task-technology fit perspectice. *International Journal of Information Technology and Management, 6*(2-4), 343-361.

Wagenhofer, A. (2016). Exploiting regulatory changes for research in management accounting. *Management Accounting Research, 31*, 112-117.

Warren Jr, J. D., Moffitt, K. C., & Byrnes, P. (2015). How Big Data will change accounting. *Accounting Horizons, 29*(2), 397-407.

Weber, K., Otto, B., & Österle, H. (2009). One size does not fit all - a contingency approach to data governance. *Journal of Data and Information Quality, 1*(1), 4.

Weill, P., & Ross, J. W. (2004). *IT governance: How top performers manage IT decision rights for superior results*: Harvard Business Press.

Wende, K. (2007). A model for data governance-Organising accountabilities for data quality management. *ACIS 2007 Proceedings*, 80.

Wickham, H., & Chang, W. (2016) ggplot2: Create elegant data visualisations using the grammar of graphics. Version 2.2.1. Retrieved from https://cran.r-project.org/web/packages/ggplot2/ggplot2.pdf

Womack, B., Robertson, J., & Riley, M. (2017). Equifax's Historic Hack May Have Exposed Almost Half of U.S. *Bloomberg Technology*. Retrieved from https://www.bloomberg.com/news/articles/2017-09-08/equifax-s-historic-hack-may-have-exposed-almost-half-of-u-s

Yoon, Y., & Guimaraes, T. (1995). Assessing expert systems impact on users' jobs. *Journal of Management Information Systems, 12*(1), 225-249.

Published Supporting Conference Proceedings

Stead, C., & Vatanasakdakul, S. (2017). IFRS 9 (Financial Instruments) and the Heightened Demand for Big Data Governance. A Preliminary Literature Review. *Pacific Asia Conference on Information Systems 2017 Proceedings,* 249.

Appendix A: Participant Information Statement

SURVEY ON THE SUCCESS FACTORS IN INFORMATION TECHNOLOGY READINESS FOR IFRS 9 ADOPTION

PARTICIPANT INFORMATION STATEMENT

Dear Sir/Madam,

You are invited to participate in this survey which is a core part of my research under the supervision of Dr Savanid (Nui) Vatanasakdakul (+61 02 9850 4855 savanid.vatanasakdakul@mq.edu.au) and Dr Michael Quilter (+61 02 9850 8456 michael.quilter@mq.edu.au) from Macquarie University's Department of Accounting and Corporate Governance in the Faculty of Business and Economics. The purpose of this questionnaire survey is to investigate success factors in information technology readiness for International Financial Reporting Standard (IFRS) 9 adoption in affected entities.

This questionnaire is anonymous. No individual or organisation's name and contact information is required. It will take approximately 15-20 minutes to complete this questionnaire. The questionnaire is delivered in two sections. The first section collects a general profile of the participant. Section two collects information regarding success factors related to information technology readiness for IFRS 9 adoption.

All information provided is confidential. No individual identity or organisation will be identified in any publication of the results. Data will be held solely by the researcher and used for research purposes only. The results of this survey will be used for my Master of Research thesis, which will be made available at Macquarie University for public access. A summary of the results can be made available to you at your request. Should you have any inquiries about this survey, please feel free to contact me.

I would very much appreciate your participation by completing this survey questionnaire. Completion of the questionnaire denotes your consent to participate. Your response is immensely valuable for research which seeks to contribute to the understanding of how changes in International Financial Reporting Standards impact on information technology, which may enable affected entities to reduce information technology related burdens associated with compliance.

Participation in this survey is entirely voluntary. If you do not wish to participate, you may simply not complete the questionnaire without having to give a reason and without consequence.

Thank you,

Connor Stead

Master of Research Candidate
Department of Accounting and Corporate Governance
Faculty of Business and Economics
Macquarie University, NSW, Australia
Email: connor.stead@hdr.mq.edu.au
Phone: +61 0450 061 366
LinkedIn: www.linkedin.com/in/connorstead/

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics & Integrity (telephone +61 02 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

Appendix B: Qualtrics Survey Instrument

Block 1

MACQUARIE University

SURVEY ON THE SUCCESS FACTORS IN INFORMATION TECHNOLOGY READINESS FOR IFRS 9 ADOPTION

PARTICIPANT INFORMATION STATEMENT

Dear Sir / Madam,

You are invited to participate in this survey which is a core part of my research under the supervision of Dr Savanid (Nui) Vatanasakdakul (+61 02 9850 4855 savanid.vatanasakdakul@mq.edu.au) and Dr Michael Quilter (+61 02 9850 8456 michael.quilter@mq.edu.au) from Macquarie University's Department of Accounting and Corporate Governance in the Faculty of Business and Economics. The purpose of this questionnaire survey is to investigate success factors in information technology readiness for International Financial Reporting Standard (IFRS) 9 adoption in affected entities.

This questionnaire is anonymous. No individual or organisation's name and contact information is required.

It will take approximately 15 minutes to complete this questionnaire. The questionnaire is delivered in two sections. The first section collects a general profile of the participant. Section two collects information regarding success factors related to information technology readiness for IFRS 9 adoption.

All information provided is confidential. No individual identity or organisation will be identified in any publication of the results. Data will be held solely by the researcher and used for research purposes only. The results of this survey will be used for my Master of Research thesis, which will be made available at Macquarie University for public access. A summary of the results can be made available to you at your request. Should you have any inquiries about this survey, please feel free to contact me.

I would very much appreciate your participation by completing this survey questionnaire. Completion of the questionnaire denotes your consent to participate. Your response is immensely valuable for research which seeks to contribute to the understanding of how changes in International Financial Reporting Standards impact on information technology, which may enable affected entities to reduce information technology related burdens

associated with compliance.

Participation in this survey is entirely voluntary. If you do not wish to participate, you may simply not complete the questionnaire without having to give a reason and without consequence.

Thank you,

Connor Stead

Master of Research Candidate

Department of Accounting and Corporate Governance

Faculty of Business and Economics

Macquarie University, NSW, Australia

Email: connor.stead@hdr.mq.edu.au

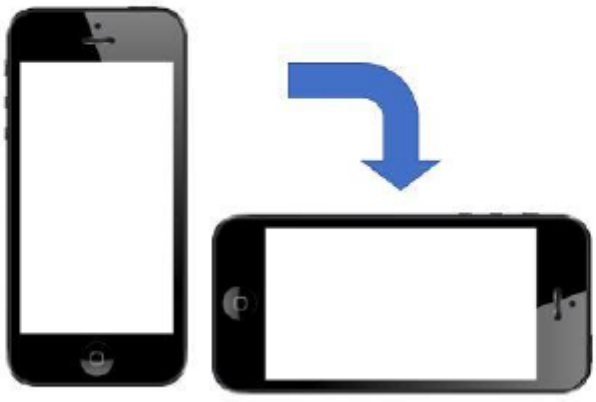
Phone: +61 0450 061 366

LinkedIn: www.linkedin.com/in/connorstead/

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics & Integrity (telephone +61 02 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

Mobile Users

For an optimal experience completing this survey,
please tilt your device into landscape mode.



Section 1

General Profile of the Participant

I am a:

- ○ Male
- ○ Female
- ○ Other

My age is:

My highest education is:

- ○ College diploma/certificate
- ○ Undergraduate degree
- ○ Postgraduate degree (Master/Ph.D.)
- ○ Other

How many years of experience do you have with your organisation?

- ○ 0 – 5 years
- ○ 6 – 10 years
- ○ 11 – 15 years
- ○ 16 years or more

How many years of experience do you have with International Financial Reporting Standards (IFRS)?

- ○ 0 – 5 years
- ○ 6 – 10 years
- ○ 11 – 15 years
- ○ 16 years or more

What is your job title?

What information systems applications within your organisation are impacted by International Financial Reporting Standard 9 (IFRS 9)?

1
2
3
4
5

Have any of the following vendors offering IFRS 9 technology solutions been involved in your organisation's IFRS 9 implementation project?

- [ ] AxiomSL
- [ ] Ferbach
- [ ] FIS
- [ ] Misys
- [ ] Moody's Analytics
- [ ] Oracle
- [ ] Prometeia
- [ ] Quantifi
- [ ] SAP
- [ ] SAS
- [ ] Wolters Kluwer FS
- [ ] Other

Which country is your organisation's head office is located in?

If different to your organisation's head office, which country is your office located in?

How many people work in your organisation?

- ○ 1 – 49 people
- ○ 50 – 249 people
- ○ 250 - 499 people
- ○ 500 people or more

What industry sector does your organisation reside in?

What is your organisation's annual revenue?

	Currency	Revenue
Please select the currency and type in the annual revenue amount.		

Section 2

Please identify to what extent you agree with the following statements, indicating your answer on the following scale by ticking (✓) the most suitable box.

The questions in this section refer to the information system (IS) most impacted by the requirements of International Financial Reporting Standard 9 (IFRS 9).

Please attempt all questions. Any missing questions will result in the inability to use your response.

1. In my organisation …

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
….. the information system (IS) operates reliably.	○	○	○	○	○	○	○
….. the IS performs reliably.	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... the operation of the IS is dependable.	○	○	○	○	○	○	○

2. In my organisation, the Information System (IS) ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... effectively integrates data from different areas of the organisation.	○	○	○	○	○	○	○
..... is capable of pulling together information from different places in the organisation.	○	○	○	○	○	○	○
..... effectively combines data from different areas of the organisation.	○	○	○	○	○	○	○

3. In my organisation, the IS can ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... handle large ***volumes*** of data that consumes large amounts of storage and/or consists of a large number of records.	○	○	○	○	○	○	○
..... integrate data generated from a ***variety*** of internal and/or external sources existing in a range of different formats.	○	○	○	○	○	○	○
..... accommodate data generated and/or captured at high ***velocity*** (frequency or speed).	○	○	○	○	○	○	○
..... address the inherent unpredictability of data to gain reliable predictions (***veracity***).	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... generate economically worthy insights and benefits (*value*) through data extraction and transformation.	○	○	○	○	○	○	○

4. Overall, the IS of my organisation ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... is rated highly.	○	○	○	○	○	○	○
..... is of high quality.	○	○	○	○	○	○	○
..... would be given a high rating.	○	○	○	○	○	○	○

5. In my organisation, the output produced by the IS for IFRS 9 reporting is ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... the most recent.	○	○	○	○	○	○	○
..... the most current.	○	○	○	○	○	○	○
..... always up to date.	○	○	○	○	○	○	○

6. In my organisation, the output produced by the IS for IFRS 9 reporting is ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... complete.	○	○	○	○	○	○	○
..... contains no errors.	○	○	○	○	○	○	○
..... accurate.	○	○	○	○	○	○	○

7. Overall, in my organisation the output produced by the IS for IFRS 9 reporting ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... is rated highly.	○	○	○	○	○	○	○
..... is of high quality.	○	○	○	○	○	○	○
..... would be given a high rating.	○	○	○	○	○	○	○

Questions 8 – 10 refer to your organisation's 'IT Support Team'.

For IFRS 9 implementation and applications this team may provide support in the form of IT training and technical support .

7. Dependability of the IT Support Team

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
When the IT Support Team promises to do something by a certain time, they do so.	○	○	○	○	○	○	○
When departments within the organisation encounter a problem, the IT Support Team shows a sincere interest in solving it.	○	○	○	○	○	○	○
The IT Support Team insists on error-free records.	○	○	○	○	○	○	○

8. Assurance of the IT Support Team

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
The behaviour of the IT Support Team instills confidence in employees of other departments.	○	○	○	○	○	○	○
Users feel safe in their transactions with the IT Support Team.	○	○	○	○	○	○	○
IT Support Team have the knowledge required to do their jobs well.	○	○	○	○	○	○	○

9. Overall, in my organisation the IT Support Team...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... is rated highly.	○	○	○	○	○	○	○
..... is of high quality.	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... would be given a high rating.	○	○	○	○	○	○	○

11. My organisation ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... continuously examines innovative opportunities for the strategic use of IFRS 9 analytics.	○	○	○	○	○	○	○
..... enforces adequate plans for the utilization of IFRS 9 analytics.	○	○	○	○	○	○	○
..... performs IFRS 9 analytics planning processes in systematic ways.	○	○	○	○	○	○	○
..... frequently adjusts IFRS 9 analytics plans to better adapt to changing conditions.	○	○	○	○	○	○	○

12. In my organisation ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... the responsibility for IFRS 9 analytics development is clear.	○	○	○	○	○	○	○
..... IFRS 9 analytics project proposals are properly appraised.	○	○	○	○	○	○	○
..... the performance of the IFRS 9 analytics function is constantly monitored.	○	○	○	○	○	○	○
..... the IFRS 9 analytics personnel are clear about their job description and key performance criteria.	○	○	○	○	○	○	○

13. My organisation's IFRS 9 analytics personnel ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... show superior understanding of technological trends.	○	○	○	○	○	○	○
..... show superior ability to learn new technologies.	○	○	○	○	○	○	○
..... are very knowledgeable about the role of IFRS analytics as a means, not an end.	○	○	○	○	○	○	○

14. Overall, my organisation's big data and analytics capabilities ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... is rated highly.	○	○	○	○	○	○	○
..... is of high quality.	○	○	○	○	○	○	○
..... would be given a high rating.	○	○	○	○	○	○	○

15. For IFRS 9 requirements, my organisation intends to regularly use ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... data mining and analysis aplications.	○	○	○	○	○	○	○
..... scorecard and metrics applications.	○	○	○	○	○	○	○
..... early warning system applications.	○	○	○	○	○	○	○
..... reporting and dashboard applications.	○	○	○	○	○	○	○

16. For IFRS 9 requirements my organisation intends to use IFRS 9 Applications...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... consistently.	○	○	○	○	○	○	○
..... frequently.	○	○	○	○	○	○	○
..... constantly.	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... regularly.	○	○	○	○	○	○	○

17. My organisation ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... is on track to meet the IFRS 9 compliance deadline.	○	○	○	○	○	○	○
..... has a high chance of meeting the IFRS 9 compliance deadline.	○	○	○	○	○	○	○
..... is on track to meet all the IFRS 9 compliance requirements.	○	○	○	○	○	○	○
..... has a high chance of meeting all the IFRS 9 compliance requirements.	○	○	○	○	○	○	○

18. In my organisation, IFRS 9 Applications help to ...

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
..... ensure high efficiency in risk decision making processes.	○	○	○	○	○	○	○
..... ensure good co-ordination amongst functional areas.	○	○	○	○	○	○	○
..... maximise profit margins.	○	○	○	○	○	○	○
..... maximise market share.	○	○	○	○	○	○	○
..... maximise strategic planning efficiency.	○	○	○	○	○	○	○

19. Do you have any additional thoughts on the Success Factors in Information Technology Readiness for IFRS 9? (This is an optional question)

End of questionnaire.
Thank you for your contribution.

If you are interested in receiving a one page outline of the results from this survey, please enter your email address below.

Your email address will not be associated with your responses to the questions and will be used exclusively for communicating the results.

You are not required to enter your email address.

Appendix C: Ethics Approval

From: Nikola Balnave
Sent: Wednesday, 5 July 2017 8:29:13 PM
To: Savanid Vatanasakdakul
Cc: FBE Ethics
Subject: Ethics Approval - Application 5201700639

Dear Dr Vatanasakdakul,

Re: 'Exploring success factors in Information Technology readiness for IFRS 9 adoption'.
Reference Number: 5201700639
The above application was reviewed by the Faculty of Business & Economics Human Research Ethics Sub Committee. Approval of the above application is
granted, effective "05/07/2017". This email constitutes ethical approval only.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at
the following web site: http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel are authorised to conduct this research:

Dr. Savanid (Nui) Vatanasakdakul
Dr. Michael Quilter
Connor Stead

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research.

2. Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 5th July 2018
Progress Report 2 Due: 5th July 2019
Progress Report 3 Due: 5th July 2020
Progress Report 4 Due: 5th July 2021
Final Report Due: 5th July 2022

NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been
discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.
Progress reports and Final Reports are available at the following website:
http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final

Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in
an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for
Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the
continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University.
This information is available at the following websites:
http://www.mq.edu.au/policy/
http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the
Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will
not be informed that you have approval for your project and funds will not be released until the Research Grants Management Assistant has received a
copy of this email.

If you need to provide a hard copy letter of approval to an external organisation as evidence that you have approval, please do not hesitate to
contact the FBE Ethics Committee Secretariat, via fbe-ethics@mq.edu.au or 9850 4826.

Please retain a copy of this email as this is your official notification of ethics approval.

Yours sincerely,

Dr. Nikola Balnave
Chair, Faculty of Business and Economics Ethics Sub-Committee
Dr Nikola Balnave
Senior Lecturer, Department of Marketing & Management
Faculty of Business and Economics
E4A 509 | Macquarie University NSW 2109
Phone:+61 (0)2 9850 7278| Fax: +61 (0)2 9850 6065
Email: nikki.balnave@mq.edu.au | Website: www.bus.mq.edu.au

Appendix D: Descriptive SEM PLS Statistics

Measurement Item	Code	n	Mean	Median	Min	Max	Range	Standard Deviation	Skew	Kurtosis	Std. Error
Reliability											
In my organisation the information system (IS) operates reliably.	RELI1	107	5.056	5	1	7	6	1.559	-1.024	0.414	0.151
In my organisation the IS performs reliably.	RELI2	107	5.103	6	1	7	6	1.394	-1.073	0.681	0.135
In my organisation the operation of the IS is dependable.	RELI3	107	5.047	5	1	7	6	1.469	-0.893	0.312	0.142
Integration											
In my organisation, the Information System (IS) effectively integrates data from different areas of the organisation.	INTG1	107	4.766	5	1	7	6	1.646	-0.659	-0.615	0.159
In my organisation, the Information System (IS) is capable of pulling together information from different places in the organisation.	INTG2	107	4.720	5	1	7	6	1.687	-0.670	-0.662	0.163
In my organisation, the Information System (IS) effectively combines data from different areas of the organisation.	INTG3	107	4.589	5	1	7	6	1.743	-0.518	-0.816	0.168
Big Data Characteristics											
In my organisation, the IS can handle large volumes of data that consumes large amounts of storage and/or consists of a large number of records.	BDATA1	107	5.243	6	1	7	6	1.565	-1.148	0.767	0.151
In my organisation, the IS can integrate data generated from a variety of internal and/or external sources existing in a range of different formats.	BDATA2	107	4.776	5	1	7	6	1.667	-0.626	-0.512	0.161

Measurement Item	Code	n	Mean	Median	Min	Max	Range	Standard Deviation	Skew	Kurtosis	Std. Error
In my organisation, the IS can accommodate data generated and/or captured at high velocity (frequency or speed).	BDATA3	107	4.551	5	1	7	6	1.667	-0.416	-0.653	0.161
In my organisation, the IS can address the inherent unpredictability of data to gain reliable predictions (veracity).	BDATA4	107	4.421	5	1	7	6	1.517	-0.436	-0.527	0.147
In my organisation, the IS can generate economically worthy insights and benefits (value) through data extraction and transformation.	BDATA5	107	4.748	5	1	7	6	1.421	-0.648	0.044	0.137
System Quality											
Overall, the IS of my organisation is rated highly.	SYSQ1	107	4.785	5	1	7	6	1.492	-0.595	-0.322	0.144
Overall, the IS of my organisation is of high quality.	SYSQ2	107	4.757	5	1	7	6	1.510	-0.582	-0.343	0.146
Overall, the IS of my organisation would be given a high rating.	SYSQ3	107	4.617	5	1	7	6	1.594	-0.419	-0.835	0.154
Currency											
In my organisation, the output produced by the IS for IFRS 9 reporting is the most recent.	CURR1	107	5.131	5	1	7	6	1.360	-0.457	-0.243	0.132
In my organisation, the output produced by the IS for IFRS 9 reporting is the most current.	CURR2	107	5.140	5	1	7	6	1.328	-0.566	-0.131	0.128
In my organisation, the output produced by the IS for IFRS 9 reporting is always up to date.	CURR3	107	4.804	5	1	7	6	1.424	-0.316	-0.661	0.138
Accuracy											
In my organisation, the output produced by the IS for IFRS 9 reporting is complete.	ACCU1	107	4.701	5	1	7	6	1.567	-0.290	-1.014	0.152

Measurement Item	Code	n	Mean	Median	Min	Max	Range	Standard Deviation	Skew	Kurtosis	Std. Error
In my organisation, the output produced by the IS for IFRS 9 reporting is contains no errors.	ACCU2	107	4.121	4	1	7	6	1.497	-0.222	-0.666	0.145
In my organisation, the output produced by the IS for IFRS 9 reporting is accurate.	ACCU3	107	4.645	5	1	7	6	1.326	-0.274	-0.259	0.128
Information Quality											
Overall, in my organisation the output produced by the IS for IFRS 9 reporting is rated highly.	INFOQ1	107	4.701	5	1	7	6	1.396	-0.516	-0.376	0.135
Overall, in my organisation the output produced by the IS for IFRS 9 reporting is of high quality.	INFOQ2	107	4.710	5	1	7	6	1.339	-0.425	-0.383	0.129
Overall, in my organisation the output produced by the IS for IFRS 9 reporting would be given a high rating.	INFOQ3	107	4.645	5	1	7	6	1.396	-0.348	-0.542	0.135
Dependability											
When the IT Support Team promises to do something by a certain time, they do so.	DPND1	107	4.551	5	1	7	6	1.661	-0.340	-0.902	0.161
When departments within the organisation encounter a problem, the IT Support Team shows a sincere interest in solving it.	DPND2	107	5.075	5	1	7	6	1.503	-0.770	0.107	0.145
The IT Support Team insists on error-free records.	DPND3	107	4.430	5	1	7	6	1.683	-0.345	-0.724	0.163
Assurance											
The behaviour of the IT Support Team instils confidence in employees of other departments.	ASSU1	107	4.710	5	1	7	6	1.620	-0.534	-0.477	0.157
Users feel safe in their transactions with the IT Support Team.	ASSU2	107	4.757	5	1	7	6	1.510	-0.598	-0.332	0.146

Measurement Item	Code	n	Mean	Median	Min	Max	Range	Standard Deviation	Skew	Kurtosis	Std. Error
IT Support Team have the knowledge required to do their jobs well.	ASSU3	107	4.925	5	1	7	6	1.385	-0.711	0.027	0.134
Service Quality											
Overall, in my organisation the IT Support Team is rated highly.	SERVQ1	107	4.645	5	1	7	6	1.513	-0.397	-0.546	0.146
Overall, in my organisation the IT Support Team is of high quality.	SERVQ2	107	4.673	5	1	7	6	1.606	-0.466	-0.601	0.155
Overall, in my organisation the IT Support Team would be given a high rating.	SERVQ3	107	4.607	5	1	7	6	1.471	-0.455	-0.290	0.142
IFRS 9 Analytics Planning											
My organisation continuously examines innovative opportunities for the strategic use of IFRS 9 analytic	IFRS9PLAN1	107	5.150	6	1	7	6	1.601	-0.871	-0.048	0.155
My organisation enforces adequate plans for the utilization of IFRS 9 analytics.	IFRS9PLAN2	107	5.131	6	1	7	6	1.505	-0.813	-0.137	0.146
My organisation performs IFRS 9 analytics planning processes in systematic ways.	IFRS9PLAN3	107	5.075	5	1	7	6	1.540	-0.753	-0.116	0.149
My organisation frequently adjusts IFRS 9 analytics plans to better adapt to changing conditions.	IFRS9PLAN4	107	5.131	6	1	7	6	1.511	-0.723	-0.230	0.146
IFRS 9 Analytics Governance											
In my organisation the responsibility for IFRS 9 analytics development is clear.	IFRS9GOVN1	107	5.224	6	1	7	6	1.488	-0.928	0.034	0.144
In my organisation IFRS 9 analytics project proposals are properly appraised.	IFRS9GOVN2	107	5.178	6	1	7	6	1.472	-0.920	-0.004	0.142
In my organisation the performance of the IFRS 9 analytics function is constantly monitored.	IFRS9GOVN3	107	5.150	6	1	7	6	1.433	-0.794	-0.117	0.139

Measurement Item	Code	n	Mean	Median	Min	Max	Range	Standard Deviation	Skew	Kurtosis	Std. Error
In my organisation the IFRS 9 analytics personnel are clear about their job description and key perform	IFRS9GOVN4	107	4.953	5	1	7	6	1.463	-0.780	-0.143	0.141
IFRS 9 Analytics Personnel											
My organisation's IFRS 9 analytics personnel show superior understanding of technological trends.	IFRS9PERS1	107	4.935	5	1	7	6	1.550	-0.811	-0.109	0.150
My organisation's IFRS 9 analytics personnel show superior ability to learn new technologies.	IFRS9PERS2	107	4.963	5	1	7	6	1.434	-0.696	-0.098	0.139
My organisation's IFRS 9 analytics personnel are very knowledgeable about the role of IFRS analytics as	IFRS9PERS3	107	4.991	5	1	7	6	1.411	-0.882	0.503	0.136
Organisational Big Data Analytics											
Overall, my organisation's big data and analytics capabilities is rated highly.	IFRS9BDA1	107	4.654	5	1	7	6	1.666	-0.553	-0.505	0.161
Overall, my organisation's big data and analytics capabilities is of high quality.	IFRS9BDA2	107	4.533	5	1	7	6	1.650	-0.400	-0.594	0.160
Overall, my organisation's big data and analytics capabilities would be given a high rating.	IFRS9BDA3	107	4.636	5	1	7	6	1.628	-0.513	-0.443	0.157
Intention To Use IFRS 9 Applications											
For IFRS 9 requirements my organisation intends to use IFRS 9 Applications consistently.	IFRS9INTU1	107	5.411	6	1	7	6	1.414	-1.041	0.400	0.137
For IFRS 9 requirements my organisation intends to use IFRS 9 Applications frequently.	IFRS9INTU2	107	5.374	6	1	7	6	1.438	-1.174	0.875	0.139
For IFRS 9 requirements my organisation intends to use IFRS 9 Applications constantly.	IFRS9INTU3	107	5.355	6	1	7	6	1.468	-1.152	0.664	0.142

Measurement Item	Code	n	Mean	Median	Min	Max	Range	Standard Deviation	Skew	Kurtosis	Std. Error
For IFRS 9 requirements my organisation intends to use IFRS 9 Applications regularly.	IFRS9INTU4	107	5.439	6	1	7	6	1.455	-1.201	0.840	0.141
Perception of IFRS 9 Compliance											
My organisation is on track to meet the IFRS 9 compliance deadline.	IFRS9COMP1	107	5.551	6	1	7	6	1.389	-1.204	1.379	0.134
My organisation has a high chance of meeting the IFRS 9 compliance deadline.	IFRS9COMP2	107	5.729	6	1	7	6	1.350	-1.329	1.797	0.130
My organisation is on track to meet all the IFRS 9 compliance requirements.	IFRS9COMP3	107	5.439	6	1	7	6	1.506	-0.993	0.389	0.146
My organisation has a high chance of meeting all the IFRS 9 compliance requirements.	IFRS9COMP4	107	5.542	6	1	7	6	1.389	-1.142	1.157	0.134
Benefit of IFRS 9 Application Use											
In my organisation, IFRS 9 Applications help to ensure high efficiency in risk decision making processes.	BENEFIT1	107	5.224	6	1	7	6	1.305	-0.793	0.246	0.126
In my organisation, IFRS 9 Applications help to ensure good co-ordination amongst functional areas.	BENEFIT2	107	5.084	5	1	7	6	1.267	-0.680	0.252	0.123
In my organisation, IFRS 9 Applications help to maximise profit margins.	BENEFIT3	107	4.467	4	1	7	6	1.513	-0.181	-0.673	0.146
In my organisation, IFRS 9 Applications help to maximise market share.	BENEFIT4	107	4.327	4	1	7	6	1.559	-0.102	-0.814	0.151
In my organisation, IFRS 9 Applications help to maximise strategic planning efficiency.	BENEFIT5	107	4.832	5	1	7	6	1.417	-0.394	-0.132	0.137

Appendix E: Collinearity VIF Indicators

	ACCURACY	ATTITUDE TOWARDS IFRS 9 COMPLIANCE	BIG DATA CHARACTERISTICS	CURRENCY	DEPENDABILITY	IFRS 9 ANALYTICS GOVERNANCE	IFRS 9 ANALYTICS PERSONNEL CAPABILITIES	IFRS 9 ANALYTICS PLANNING	INFORMATION QUALITY	INTEGRATION	INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	ORGANISATIONAL BIG DATA ANALYTICS	PERCEIEVED BENEFITS OF IFRS 9 APPLICATIONS	RELIABILITY	SERVICE QUALITY	SYSTEM QUALITY
ACCURACY									**1.666**							
ATTITUDE TOWARDS IFRS 9 COMPLIANCE													**1.698**			
BIG DATA CHARACTERISTICS																**2.522**
CURRENCY									**1.666**							
DEPENDABILITY															**1.000**	
IFRS 9 ANALYTICS GOVERNANCE												**2.987**				
IFRS 9 ANALYTICS PERSONNEL CAPABILITIES												**2.258**				
IFRS 9 ANALYTICS PLANNING												**2.662**				
INFORMATION QUALITY		**1.713**									**1.713**					

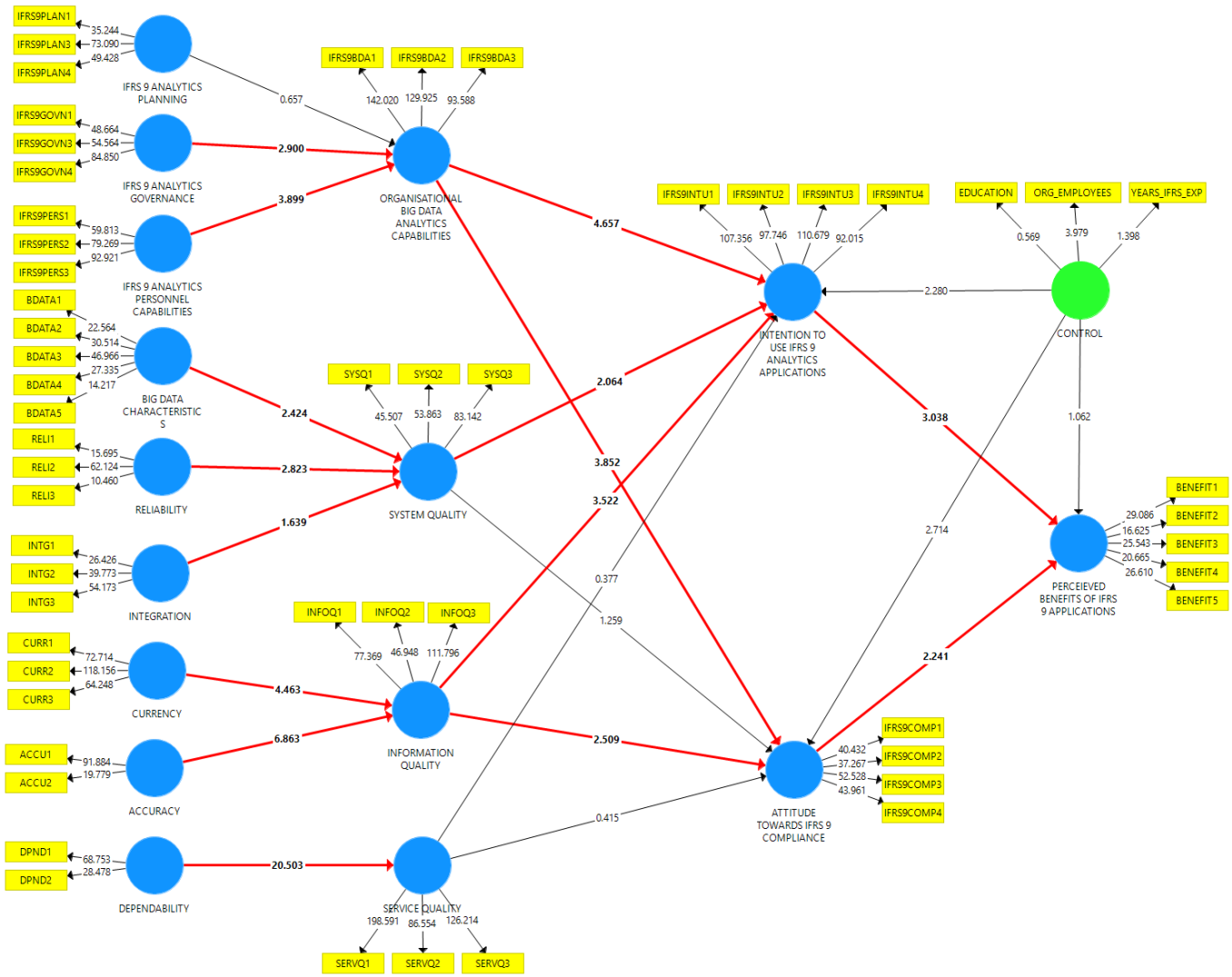
	ACCURACY	ATTITUDE TOWARDS IFRS 9 COMPLIANCE	BIG DATA CHARACTERISTICS	CURRENCY	DEPENDABILITY	IFRS 9 ANALYTICS GOVERNANCE	IFRS 9 ANALYTICS PERSONNEL CAPABILITIES	IFRS 9 ANALYTICS PLANNING	INFORMATION QUALITY	INTEGRATION	INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS	ORGANISATIONAL BIG DATA ANALYTICS	PERCEIEVED BENEFITS OF IFRS 9 APPLICATIONS	RELIABILITY	SERVICE QUALITY	SYSTEM QUALITY
INTEGRATION																**2.689**
INTENTION TO USE IFRS 9 ANALYTICS APPLICATIONS													**1.698**			
ORGANISATIONAL BIG DATA ANALYTICS CAPABILITIES		**2.710**									**2.710**					
PERCEIEVED BENEFITS OF IFRS 9 APPLICATIONS																
RELIABILITY																**1.587**
SERVICE QUALITY		**1.871**									**1.871**					
SYSTEM QUALITY		**2.484**									**2.484**					

Appendix F: Respondent and Head Office Locations

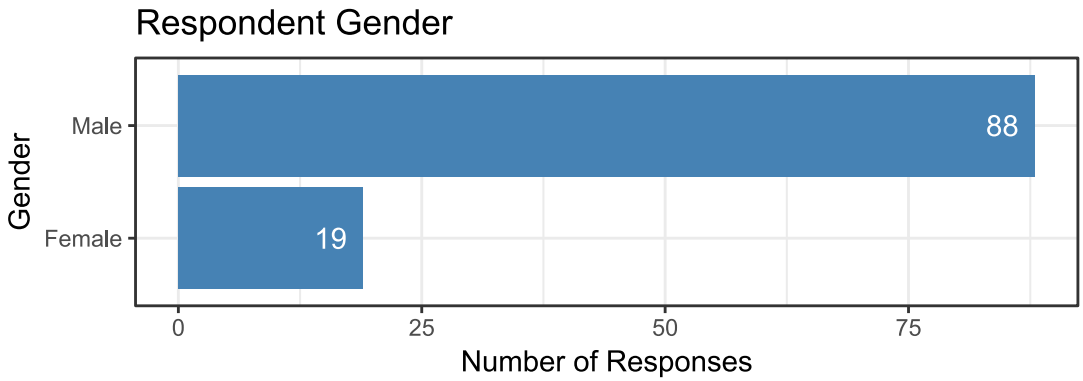
Respondent Location	n	Frequency (%)
United Kingdom	11	10.28
France	9	8.41
United States of America	9	8.41
Netherlands	6	5.61
Spain	6	5.61
United Arab Emirates	5	4.67
Austria	4	3.74
Germany	4	3.74
South Africa	4	3.74
Ireland	3	2.80
Pakistan	3	2.80
Qatar	3	2.80
Slovenia	3	2.80
Zimbabwe	3	2.80
Australia	2	1.87
Canada	2	1.87
Italy	2	1.87
Kuwait	2	1.87
Mauritius	2	1.87
Singapore	2	1.87
Sweden	2	1.87
Turkey	2	1.87
Brazil	1	0.93
Côte d'Ivoire	1	0.93
Finland	1	0.93
Greece	1	0.93
Iceland	1	0.93
India	1	0.93
Japan	1	0.93
Jersey	1	0.93
Lebanon	1	0.93
Malaysia	1	0.93
Malta	1	0.93
Oman	1	0.93
Portugal	1	0.93
Saudi Arabia	1	0.93
Serbia	1	0.93
Switzerland	1	0.93
Taiwan	1	0.93
Thailand	1	0.93

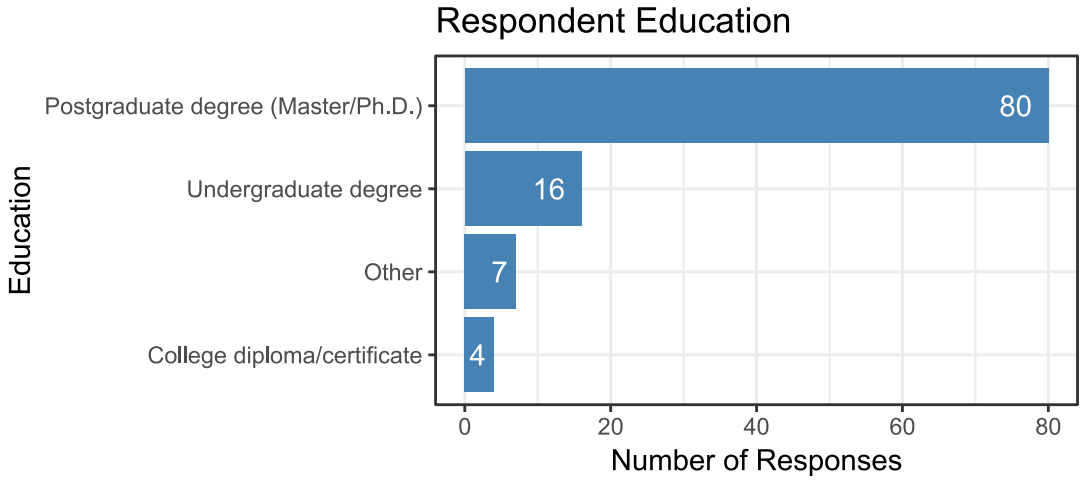
Head Office Location	n	Frequency (%)
United Kingdom	12	11.21
France	6	5.61
South Africa	5	4.67
United Arab Emirates	5	4.67
Zimbabwe	4	3.74
Australia	3	2.80
Brazil	3	2.80
Germany	3	2.80
India	3	2.80
Ireland	3	2.80
Italy	3	2.80
Pakistan	3	2.80
Qatar	3	2.80
Singapore	3	2.80
Slovenia	3	2.80
Spain	3	2.80
United States of America	3	2.80
Austria	2	1.87
Belgium	2	1.87
Canada	2	1.87
Greece	2	1.87
Kuwait	2	1.87
Malaysia	2	1.87
Mauritius	2	1.87
Netherlands	2	1.87
Portugal	2	1.87
Sweden	2	1.87
Turkey	2	1.87
Albania	1	0.93
Chile	1	0.93
Côte d'Ivoire	1	0.93
Finland	1	0.93
Iceland	1	0.93
Indonesia	1	0.93
Japan	1	0.93
Jersey	1	0.93
Lebanon	1	0.93
Mexico	1	0.93
Montenegro	1	0.93
Oman	1	0.93
Romania	1	0.93
Saudi Arabia	1	0.93
Serbia	1	0.93
Taiwan	1	0.93
Thailand	1	0.93

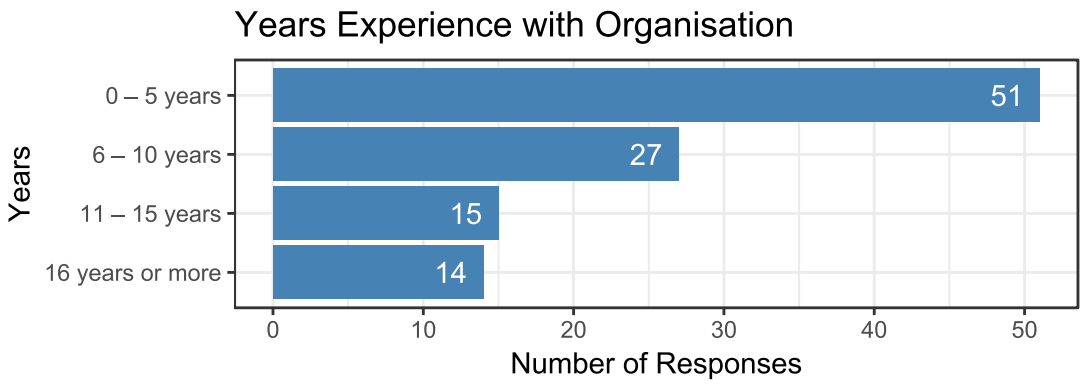
Appendix G: SmartPLS Control Variable Model Output

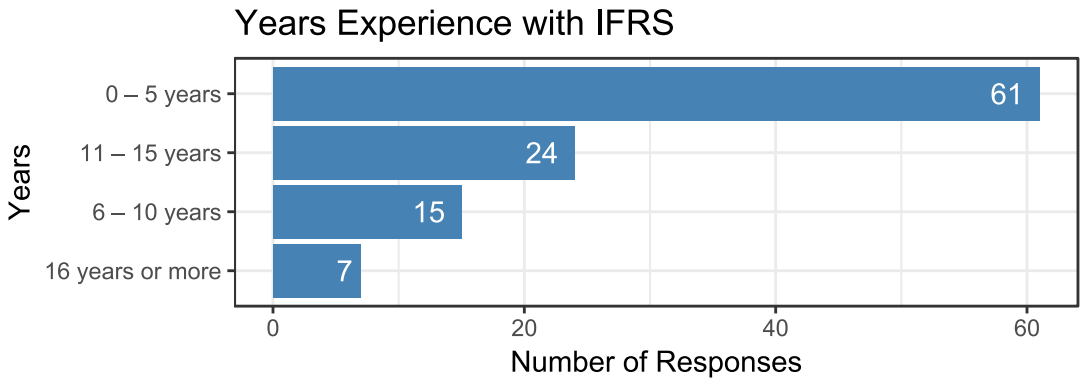


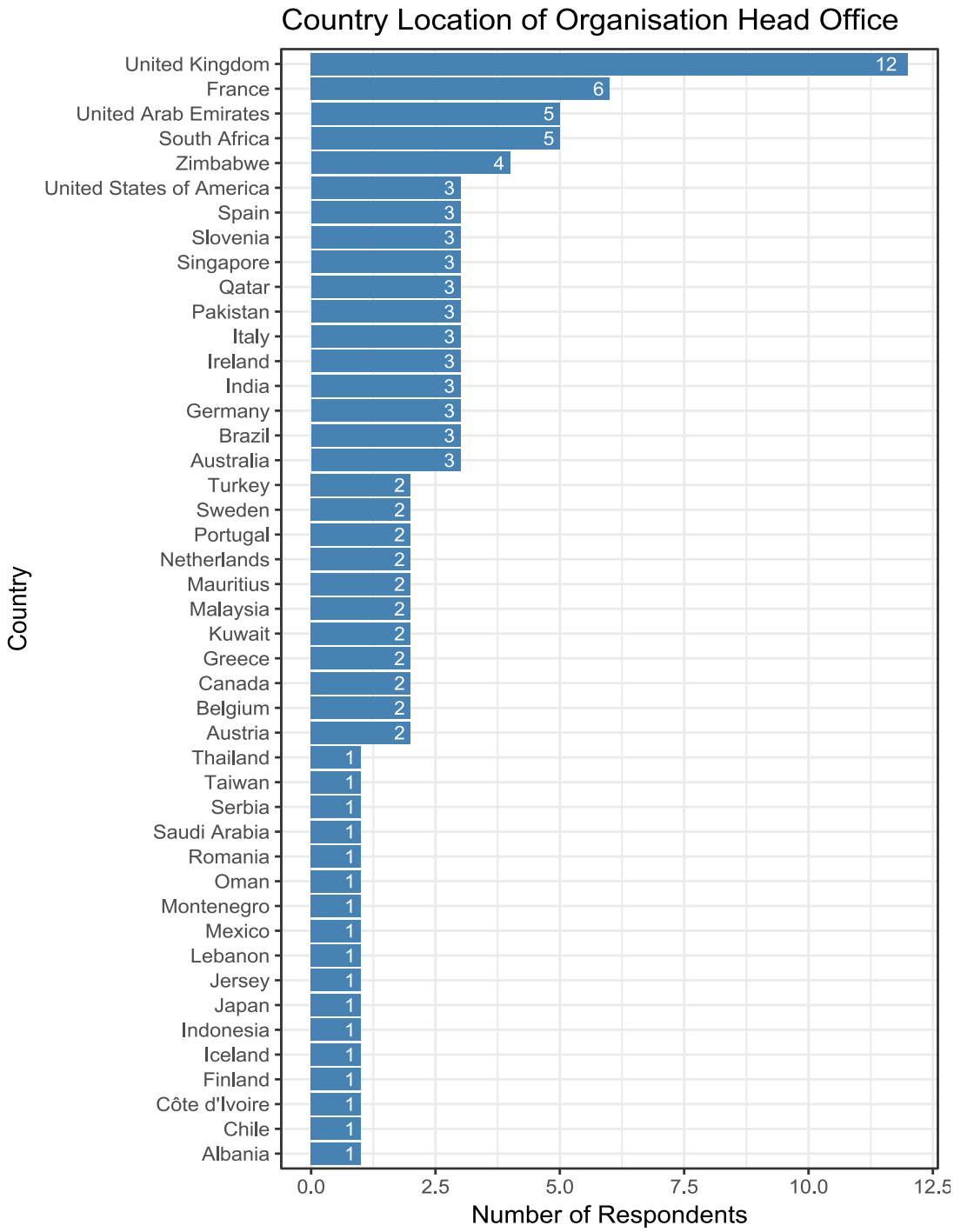
Appendix H: Response Descriptive Statistics Charts

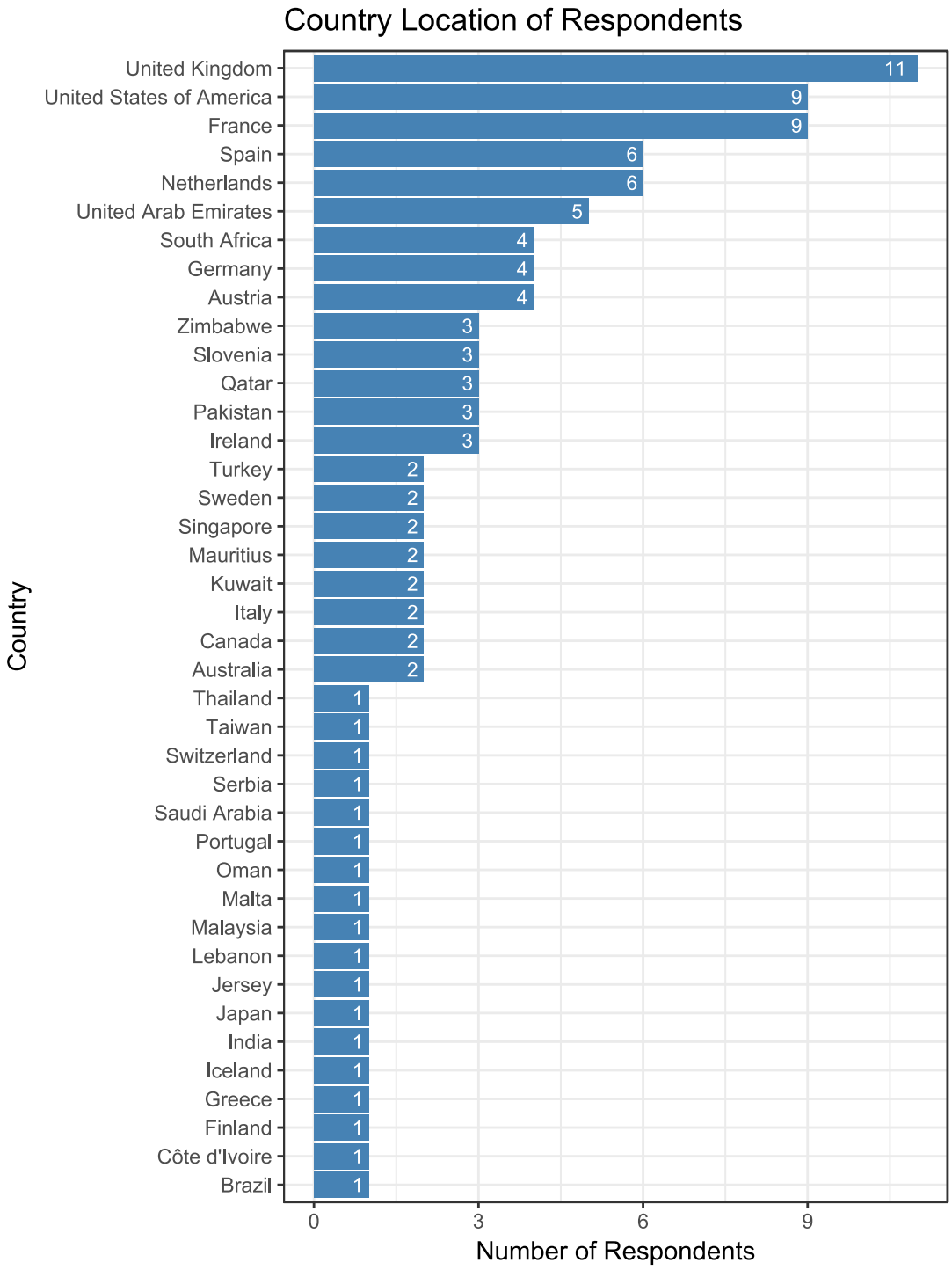


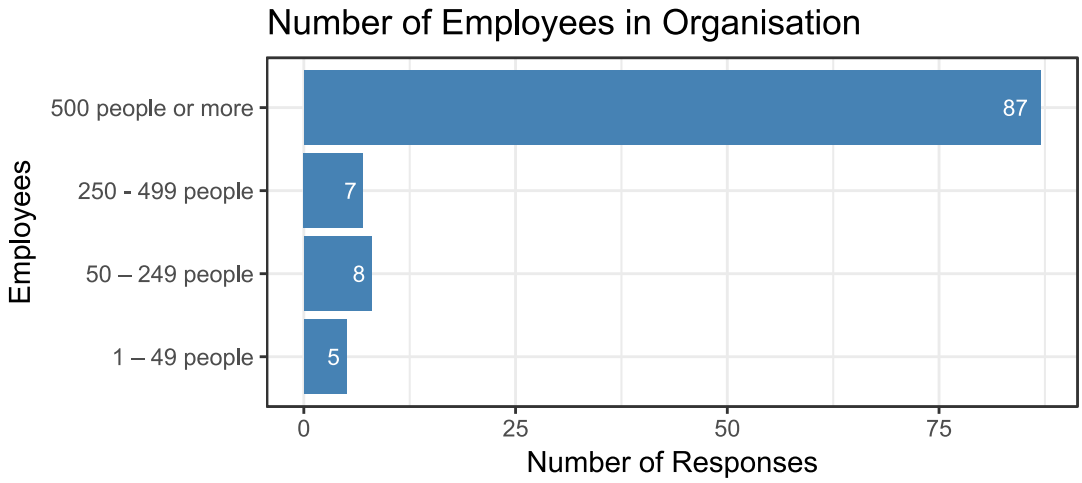


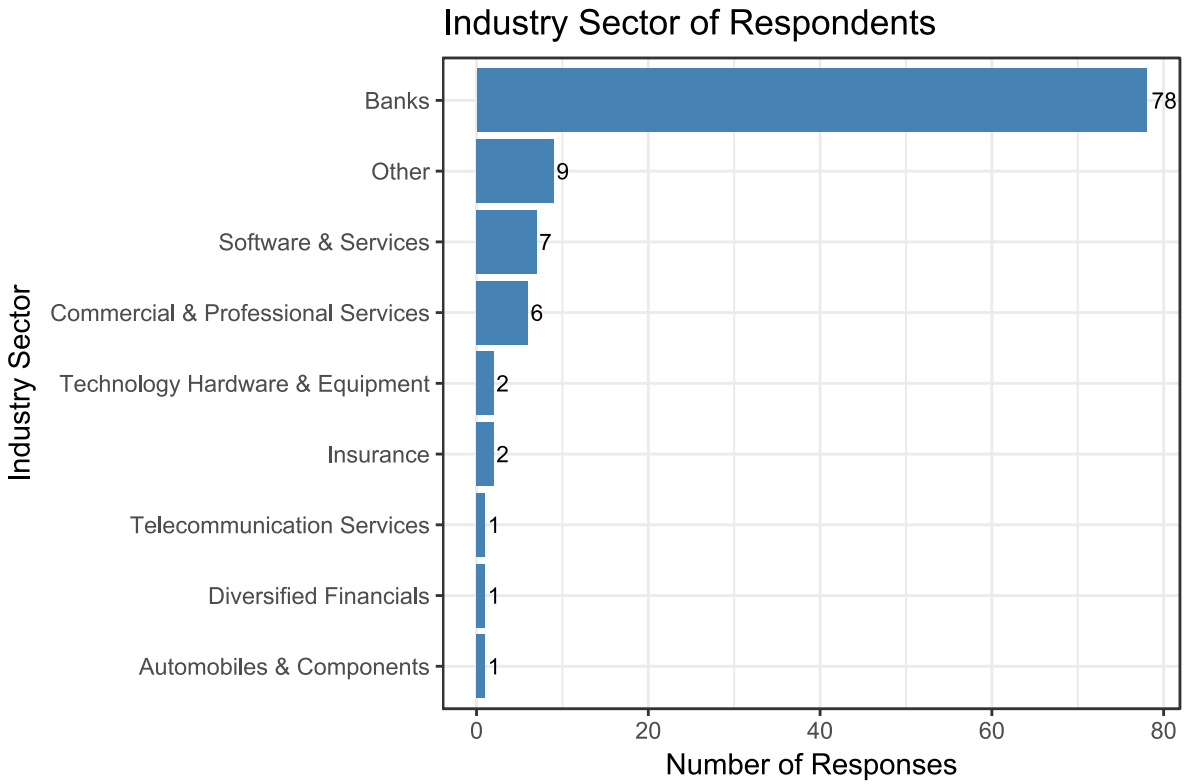


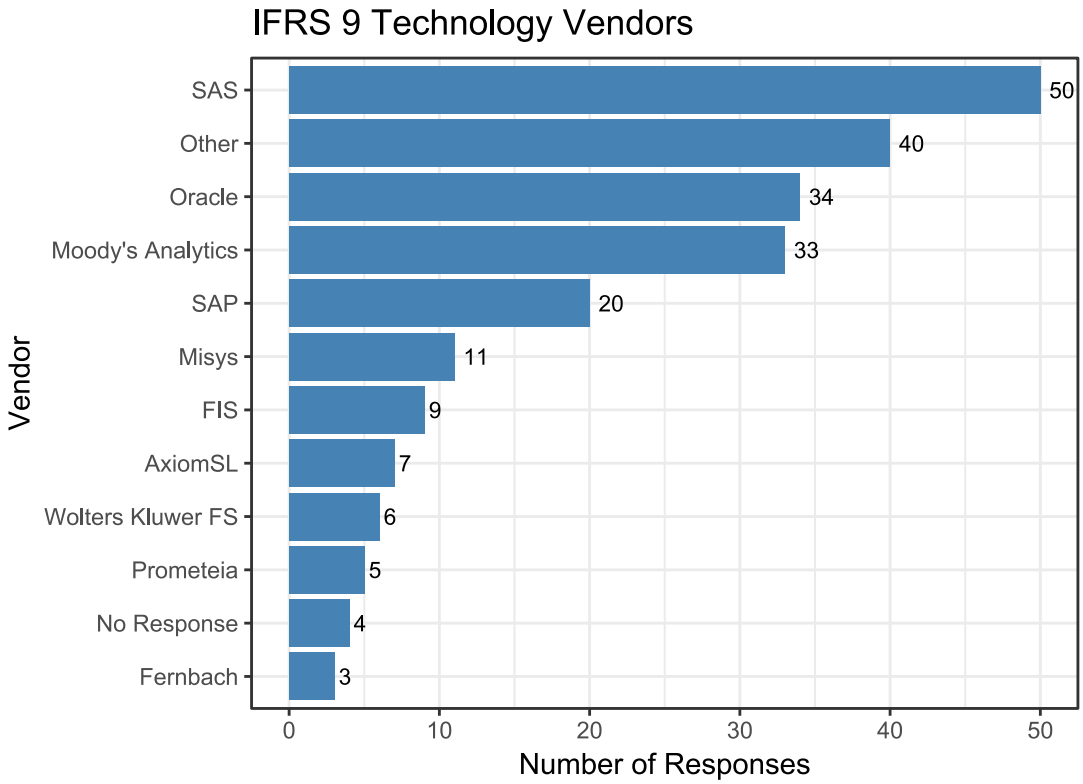

Years Experience with IFRS
Years
0 – 5 years
11 – 15 years
6 – 10 years
16 years or more
61
24
15
7
0
20
40
60
Number of Responses


Country Location of Organisation Head Office
Country
United Kingdom 12
France 6
United Arab Emirates 5
South Africa 5
Zimbabwe 4
United States of America 3
Spain 3
Slovenia 3
Singapore 3
Qatar 3
Pakistan 3
Italy 3
Ireland 3
India 3
Germany 3
Brazil 3
Australia 3
Turkey 2
Sweden 2
Portugal 2
Netherlands 2
Mauritius 2
Malaysia 2
Kuwait 2
Greece 2
Canada 2
Belgium 2
Austria 2
Thailand 1
Taiwan 1
Serbia 1
Saudi Arabia 1
Romania 1
Oman 1
Montenegro 1
Mexico 1
Lebanon 1
Jersey 1
Japan 1
Indonesia 1
Iceland 1
Finland 1
Côte d'Ivoire 1
Chile 1
Albania 1
0.0
2.5
5.0
7.5
10.0
12.5
Number of Respondents


Country Location of Respondents
United Kingdom 11
United States of America 9
France 9
Spain 6
Netherlands 6
United Arab Emirates 5
South Africa 4
Germany 4
Austria 4
Zimbabwe 3
Slovenia 3
Qatar 3
Pakistan 3
Ireland 3
Turkey 2
Sweden 2
Singapore 2
Mauritius 2
Kuwait 2
Italy 2
Canada 2
Australia 2
Thailand 1
Taiwan 1
Switzerland 1
Serbia 1
Saudi Arabia 1
Portugal 1
Oman 1
Malta 1
Malaysia 1
Lebanon 1
Jersey 1
Japan 1
India 1
Iceland 1
Greece 1
Finland 1
Côte d'Ivoire 1
Brazil 1
Country
0
3
6
9
Number of Respondents


Number of Employees in Organisation
Employees
500 people or more
250 - 499 people
50 – 249 people
1 – 49 people
87
7
8
5
0
25
50
75
Number of Responses


Industry Sector of Respondents
Industry Sector
Banks
Other
Software & Services
Commercial & Professional Services
Technology Hardware & Equipment
Insurance
Telecommunication Services
Diversified Financials
Automobiles & Components
78
9
7
6
2
2
1
1
1
0
20
40
60
80
Number of Responses


IFRS 9 Technology Vendors
Vendor
SAS
Other
Oracle
Moody's Analytics
SAP
Misys
FIS
AxiomSL
Wolters Kluwer FS
Prometeia
No Response
Fernbach
50
40
34
33
20
11
9
7
6
5
4
3
0
10
20
30
40
50
Number of Responses

Appendix I: Pilot Survey Cronbach Alpha R Console Log

```
R version 3.4.1 (2017-06-30) -- "Single Candle"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> PilotResponses <- read.csv("C:\\Users\\Connor Stead\\IFRS 9 MRes
Thesis\\6. Statistical Analysis\\SEM PLS Analysis\\Pilot
Test\\Qualtrics Export - Numerical - Pilot Survey Responses.csv",
header = TRUE)

> str(PilotResponses)
'data.frame':   6 obs. of  63 variables:
 $ RELI1     : int  5 5 6 6 6 7
 $ RELI2     : int  4 5 5 6 6 7
 $ RELI3     : int  5 7 4 6 6 6
 $ INTG1     : int  5 6 6 5 6 5
 $ INTG2     : int  4 7 7 4 6 6
 $ INTG3     : int  6 7 4 5 6 6
 $ BDATA1    : int  7 6 3 4 6 7
 $ BDATA2    : int  4 6 6 5 7 5
 $ BDATA3    : int  7 6 5 3 6 7
 $ BDATA4    : int  7 5 5 3 6 6
 $ BDATA5    : int  4 6 6 4 7 6
 $ SYSQ1     : int  2 6 5 6 6 6
 $ SYSQ2     : int  6 5 5 5 5 6
 $ SYSQ3     : int  6 6 4 4 6 6
 $ CURR1     : int  7 5 6 6 6 5
 $ CURR2     : int  7 5 6 6 6 6
 $ CURR3     : int  5 4 6 4 6 5
 $ ACCU1     : int  5 5 7 4 6 5
 $ ACCU2     : int  3 4 5 4 6 5
 $ ACCU3     : int  2 4 5 5 4 6
 $ INFOQ1    : int  4 5 6 4 2 6
 $ INFOQ2    : int  5 3 6 3 3 6
 $ INFOQ3    : int  5 5 6 4 5 6
 $ DPND1     : int  3 3 6 5 4 5
 $ DPND2     : int  1 5 6 5 5 5
 $ DPND3     : int  5 2 5 6 2 4
 $ ASSU1     : int  7 5 3 7 5 4
 $ ASSU2     : int  7 4 5 6 6 4
 $ ASSU3     : int  6 6 5 7 5 4
 $ SERVQ1    : int  5 5 6 6 5 3
 $ SERVQ2    : int  5 3 6 6 3 3
 $ SERVQ3    : int  5 4 4 5 3 3
 $ IFRS9PLAN1: int  4 5 6 4 6 5
 $ IFRS9PLAN2: int  5 3 5 4 5 5
 $ IFRS9PLAN3: int  5 3 5 3 7 5
 $ IFRS9PLAN4: int  7 3 5 2 5 5
 $ IFRS9GOVN1: int  5 5 6 4 6 6
 $ IFRS9GOVN2: int  7 3 5 2 3 6
 $ IFRS9GOVN3: int  6 7 7 3 6 6
 $ IFRS9GOVN4: int  6 3 6 3 6 6
```

```
 $ IFRS9PERS1: int  4 5 4 3 3 6
 $ IFRS9PERS2: int  6 5 5 3 4 6
 $ IFRS9PERS3: int  6 5 5 4 6 6
 $ IFRS9BDA1 : int  4 2 6 6 1 5
 $ IFRS9BDA2 : int  4 3 7 5 6 6
 $ IFRS9BDA3 : int  6 3 6 6 6 6
 $ IFRS9INTU1: int  6 6 6 4 3 6
 $ IFRS9INTU2: int  5 7 6 3 3 6
 $ IFRS9INTU3: int  7 6 6 4 6 6
 $ IFRS9INTU4: int  7 6 6 4 6 6
 $ IFRS9FREQ1: int  3 4 6 3 6 6
 $ IFRS9FREQ2: int  7 4 6 4 3 6
 $ IFRS9FREQ3: int  7 5 6 3 6 6
 $ IFRS9FREQ4: int  6 3 6 4 7 6
 $ IFRS9COMP1: int  2 3 5 3 6 5
 $ IFRS9COMP2: int  3 3 5 2 3 5
 $ IFRS9COMP3: int  7 2 4 2 6 5
 $ IFRS9COMP4: int  6 4 4 2 7 5
 $ BENEFIT1  : int  7 4 4 4 3 6
 $ BENEFIT2  : int  7 5 6 4 7 6
 $ BENEFIT3  : int  5 4 6 4 3 6
 $ BENEFIT4  : int  2 4 6 4 3 6
 $ BENEFIT5  : int  6 6 5 2 6 6

> require('psy')
Loading required package: psy

> cronbach(PilotResponses)
$sample.size
[1] 6

$number.of.items
[1] 63

$alpha
[1] 0.8989009
```

Appendix J: Descriptive Statistics R Console Log

```
R version 3.4.1 (2017-06-30) -- "Single Candle"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> library(readr)
> responses <- read_csv("C:/Users/Connor Stead/IFRS 9 MRes Thesis/6.
Statistical Analysis/Descriptive Statistics/110817 - 107 Responses/Qualtrics
Data Table Export - Choice Text - 110817 - Final 107 - Descriptive
Statistics.csv")
Parsed with column specification:
cols(
  Gender = col_character(),
  Age = col_integer(),
  Education = col_character(),
  Years_Org_Exp = col_character(),
  Years_IFRS_Exp = col_character(),
  Job_Title = col_character(),
  Org_IS_Impacted1 = col_character(),
  Org_IS_Impacted2 = col_character(),
  Org_IS_Impacted3 = col_character(),
  Org_IS_Impacted4 = col_character(),
  Org_IS_Impacted5 = col_character(),
  Vendors = col_character(),
  Country_Respondent_Location = col_character(),
  Country_Head_Office = col_character(),
  Org_Employees = col_character(),
  Industry_Sector = col_character(),
  Org_Revenue_Currency = col_character(),
  Org_Revenue_Value = col_character(),
  Thoughts = col_character()
)
> Parsed with column specification:
Error: unexpected symbol in "Parsed with"
>     cols(
+         Gender = col_character(),
+         Age = col_integer(),
+         Education = col_character(),
+         Years_Org_Exp = col_character(),
+         Years_IFRS_Exp = col_character(),
+         Job_Title = col_character(),
+         Org_IS_Impacted1 = col_character(),
+         Org_IS_Impacted2 = col_character(),
+         Org_IS_Impacted3 = col_character(),
+         Org_IS_Impacted4 = col_character(),
+         Org_IS_Impacted5 = col_character(),
+         Vendors = col_character(),
+         Country_Respondent_Location = col_character(),
+         Country_Head_Office = col_character(),
+         Org_Employees = col_character(),
+         Industry_Sector = col_character(),
+         Org_Revenue_Currency = col_character(),
+         Org_Revenue_Value = col_character(),
+         Thoughts = col_character()
+     )
cols(
  Gender = col_character(),
  Age = col_integer(),
```

```
  Education = col_character(),
  Years_Org_Exp = col_character(),
  Years_IFRS_Exp = col_character(),
  Job_Title = col_character(),
  Org_IS_Impacted1 = col_character(),
  Org_IS_Impacted2 = col_character(),
  Org_IS_Impacted3 = col_character(),
  Org_IS_Impacted4 = col_character(),
  Org_IS_Impacted5 = col_character(),
  Vendors = col_character(),
  Country_Respondent_Location = col_character(),
  Country_Head_Office = col_character(),
  Org_Employees = col_character(),
  Industry_Sector = col_character(),
  Org_Revenue_Currency = col_character(),
  Org_Revenue_Value = col_character(),
  Thoughts = col_character()
)
> View(responses)
>
transform(as.data.frame(table(responses$Education)),Frequency=Freq/nrow(respo
nses)*100)
                                Var1 Freq Frequency
1        College diploma/certificate    4  3.738318
2                              Other    7  6.542056
3 Postgraduate degree (Master/Ph.D.)   80 74.766355
4               Undergraduate degree   16 14.953271
>
View(transform(as.data.frame(table(responses$Education)),Frequency=Freq/nrow(
responses)*100))
>
transform(as.data.frame(table(responses$Years_Org_Exp)),Frequency=Freq/nrow(r
esponses)*100)
             Var1 Freq Frequency
1      0 - 5 years   51  47.66355
2    11 - 15 years   15  14.01869
3 16 years or more   14  13.08411
4     6 - 10 years   27  25.23364
>
View(transform(as.data.frame(table(responses$Years_Org_Exp)),Frequency=Freq/n
row(responses)*100))
>
transform(as.data.frame(table(responses$Years_IFRS_Exp)),Frequency=Freq/nrow(
responses)*100)
             Var1 Freq Frequency
1      0 - 5 years   61 57.009346
2    11 - 15 years   24 22.429907
3 16 years or more    7  6.542056
4     6 - 10 years   15 14.018692
>
View(transform(as.data.frame(table(responses$Years_IFRS_Exp)),Frequency=Freq/
nrow(responses)*100))
> vendorstats <- as.list(strsplit(responses$Vendors, ","))
> vendorstats <- unlist(vendorstats)
> vendorstats[is.na(vendorstats)] <- "No Response"
> vendorstats[vendorstats == "Ferbach"] <- "Fernbach"
> vendorstats <- data.frame(Vendors=vendorstats)
>
transform(as.data.frame(table(vendorstats$Vendors)),Frequency=Freq/nrow(respo
nses)*100)
                Var1 Freq Frequency
1            AxiomSL    7  6.542056
2           Fernbach    3  2.803738
3                FIS    9  8.411215
4              Misys   11 10.280374
5  Moody's Analytics   33 30.841121
6        No Response    4  3.738318
```

```
7              Oracle   34 31.775701
8               Other   40 37.383178
9          Prometeia    5  4.672897
10               SAP   20 18.691589
11               SAS   50 46.728972
12 Wolters Kluwer FS    6  5.607477
>
View(transform(as.data.frame(table(vendorstats$Vendors)),Frequency=Freq/nrow(
responses)*100))
>
transform(as.data.frame(table(responses$Country_Respondent_Location)),Frequen
cy=Freq/nrow(responses)*100)
                      Var1 Freq  Frequency
1                 Australia    2  1.8691589
2                   Austria    4  3.7383178
3                    Brazil    1  0.9345794
4                    Canada    2  1.8691589
5             Côte d'Ivoire    1  0.9345794
6                   Finland    1  0.9345794
7                    France    9  8.4112150
8                   Germany    4  3.7383178
9                    Greece    1  0.9345794
10                  Iceland    1  0.9345794
11                    India    1  0.9345794
12                  Ireland    3  2.8037383
13                    Italy    2  1.8691589
14                    Japan    1  0.9345794
15                   Jersey    1  0.9345794
16                   Kuwait    2  1.8691589
17                  Lebanon    1  0.9345794
18                 Malaysia    1  0.9345794
19                    Malta    1  0.9345794
20                Mauritius    2  1.8691589
21              Netherlands    6  5.6074766
22                     Oman    1  0.9345794
23                 Pakistan    3  2.8037383
24                 Portugal    1  0.9345794
25                    Qatar    3  2.8037383
26             Saudi Arabia    1  0.9345794
27                   Serbia    1  0.9345794
28                Singapore    2  1.8691589
29                 Slovenia    3  2.8037383
30             South Africa    4  3.7383178
31                    Spain    6  5.6074766
32                   Sweden    2  1.8691589
33              Switzerland    1  0.9345794
34                   Taiwan    1  0.9345794
35                 Thailand    1  0.9345794
36                   Turkey    2  1.8691589
37     United Arab Emirates    5  4.6728972
38           United Kingdom   11 10.2803738
39 United States of America    9  8.4112150
40                 Zimbabwe    3  2.8037383
>
View(transform(as.data.frame(table(responses$Country_Respondent_Location)),Fr
equency=Freq/nrow(responses)*100))
> responses$Country_Head_Office[responses$Country_Head_Office == "Same
Country as Head Office"] <-
responses$Country_Respondent_Location[responses$Country_Head_Office == "Same
Country as Head Office"]
>
transform(as.data.frame(table(responses$Country_Head_Office)),Frequency=Freq/
nrow(responses)*100)
                      Var1 Freq  Frequency
1                  Albania    1  0.9345794
```

```
2                 Australia    3  2.8037383
3                   Austria    2  1.8691589
4                   Belgium    2  1.8691589
5                    Brazil    3  2.8037383
6                    Canada    2  1.8691589
7                     Chile    1  0.9345794
8             Côte d'Ivoire    1  0.9345794
9                   Finland    1  0.9345794
10                   France    6  5.6074766
11                  Germany    3  2.8037383
12                   Greece    2  1.8691589
13                  Iceland    1  0.9345794
14                    India    3  2.8037383
15                Indonesia    1  0.9345794
16                  Ireland    3  2.8037383
17                    Italy    3  2.8037383
18                    Japan    1  0.9345794
19                   Jersey    1  0.9345794
20                   Kuwait    2  1.8691589
21                  Lebanon    1  0.9345794
22                 Malaysia    2  1.8691589
23                Mauritius    2  1.8691589
24                   Mexico    1  0.9345794
25               Montenegro    1  0.9345794
26              Netherlands    2  1.8691589
27                     Oman    1  0.9345794
28                 Pakistan    3  2.8037383
29                 Portugal    2  1.8691589
30                    Qatar    3  2.8037383
31                  Romania    1  0.9345794
32             Saudi Arabia    1  0.9345794
33                   Serbia    1  0.9345794
34                Singapore    3  2.8037383
35                 Slovenia    3  2.8037383
36             South Africa    5  4.6728972
37                    Spain    3  2.8037383
38                   Sweden    2  1.8691589
39                   Taiwan    1  0.9345794
40                 Thailand    1  0.9345794
41                   Turkey    2  1.8691589
42     United Arab Emirates    5  4.6728972
43           United Kingdom   12 11.2149533
44 United States of America    3  2.8037383
45                 Zimbabwe    4  3.7383178
>
View(transform(as.data.frame(table(responses$Country_Head_Office)),Frequency=
Freq/nrow(responses)*100))
>
transform(as.data.frame(table(responses$Org_Employees)),Frequency=Freq/nrow(r
esponses)*100)
                Var1 Freq Frequency
1      1 - 49 people    5  4.672897
2   250 - 499 people    7  6.542056
3    50 - 249 people    8  7.476636
4 500 people or more   87 81.308411
>
View(transform(as.data.frame(table(responses$Org_Employees)),Frequency=Freq/n
row(responses)*100))
>
transform(as.data.frame(table(responses$Industry_Sector)),Frequency=Freq/nrow
(responses)*100)
                              Var1 Freq  Frequency
1          Automobiles & Components    1  0.9345794
2                            Banks   78 72.8971963
3 Commercial & Professional Services    6  5.6074766
```

```
4             Diversified Financials    1  0.9345794
5                          Insurance    2  1.8691589
6                              Other    9  8.4112150
7                 Software & Services    7  6.5420561
8    Technology Hardware & Equipment    2  1.8691589
9         Telecommunication Services    1  0.9345794
>
View(transform(as.data.frame(table(responses$Industry_Sector)),Frequency=Freq
/nrow(responses)*100))
> transform(as.data.frame(table(responses$Job_Title)),Frequency=Freq/nrow(res
ponses)*100)
                                                        Var1 Freq Frequenc
y
1                                                 Accountant    1 0.934579
4
2                           Accountant IFRS Technical Team Lead    1 0.934579
4
3                                           Accounting Audit    1 0.934579
4
4                                         Accounting Director    1 0.934579
4
5                                          Assistant Manager    1 0.934579
4
6                                    Assistant Manager Finance    1 0.934579
4
7                    Assistant Manager Financial Risk Consulting    1 0.934579
4
8                                     Assistant Vice President    1 0.934579
4
9                                                 Associate    1 0.934579
4
10                                    Associate Vice President    1 0.934579
4
11                                           Audit Manager    1 0.934579
4
12                                           Audit Supervisor    1 0.934579
4
13                                           Business Analyst    1 0.934579
4
14                                 Capital and Impairment Analyst    1 0.934579
4
15                                                      CFO    1 0.934579
4
16                                        Chief Manager Finance    1 0.934579
4
17                                     Chief Operations Officer    1 0.934579
4
18                                           Chief Risk Officer    2 1.869158
9
19                                           Compliance officer    1 0.934579
4
20                                                  Consultant    2 1.869158
9
21                                 Consultant or Business Analyst    1 0.934579
4
22                                    Consultant Risk Management    1 0.934579
4
23                                  Consulting Technical Director    1 0.934579
4
24                                           Credit Risk Analyst    1 0.934579
4
25                                        Credit Risk Executive    1 0.934579
4
```

26	Credit Risk Portfolio Manager	1	0.9345794
27	Credit Risk Reporting Specialist	1	0.9345794
28	Data Analyst	1	0.9345794
29	Deputy General Manager of Risk Management	1	0.9345794
30	Director	1	0.9345794
31	Director Advanced Analytics	1	0.9345794
32	Director Advisory Services	1	0.9345794
33	Director Consulting	1	0.9345794
34	Director of Technology Risk	1	0.9345794
35	Director Product Control	1	0.9345794
36	Economist	1	0.9345794
37	Executive Director	2	1.8691589
38	Executive Vice President	1	0.9345794
39	External Auditor	1	0.9345794
40	Finance Executive Officer	1	0.9345794
41	Financial Accounting and Advisory Senior Consultant	1	0.9345794
42	Financial Controller	1	0.9345794
43	Financial Risk Manager	1	0.9345794
44	Financial Risk Managment Consultant	1	0.9345794
45	Global SME Lead for Expected Credit Losses	1	0.9345794
46	Group Senior Accountant Treasury and Investment Accounting	1	0.9345794
47	Head Financial Control and Treasury	1	0.9345794
48	Head of Accounting and Controlling Division	1	0.9345794
49	Head of Credit Analytics	1	0.9345794
50	Head of Credit Portfolio Risk	1	0.9345794
51	Head of Credit Risk Models Department	1	0.9345794
52	Head of Risk Finance and Data Quality IT Solutions	1	0.9345794
53	Head of Risk IT	1	0.9345794
54	IFRS Accounting Coordinator	1	0.9345794
55	IFRS Analyst	1	0.9345794
56	IFRS Consultant	1	0.9345794
57	IFRS Nine Analyst	1	0.9345794

58	IFRS Specialist	1	0.934579
59	Impairment Officer	2	1.869158
60	Innovation officer	1	0.934579
61	Lead Consultant	1	0.934579
62	Management Consultant and Software Consultant	1	0.934579
63	Manager	3	2.803738
64	Manager IFRS Nine Programme	1	0.934579
65	Market Risk and Liquity Risk Controller	1	0.934579
66	MBA	1	0.934579
67	Principal Bank Examiner	1	0.934579
68	Product Officer	1	0.934579
69	Programme Director	1	0.934579
70	Project Consultant	1	0.934579
71	Project Manager	2	1.869158
72	Risk Analyst	4	3.738317
73	Risk Manager	2	1.869158
74	Risk Modelling Analyst	1	0.934579
75	Sales Manager	1	0.934579
76	Senior Advisor	1	0.934579
77	Senior Annual Financial Statement Drafting Specialist	1	0.934579
78	Senior Consultant	3	2.803738
79	Senior Consultant Risk Advisory	1	0.934579
80	Senior Consultant Risk Domain Expert	1	0.934579
81	Senior Expert Account Policy	1	0.934579
82	Senior Finance Manager	1	0.934579
83	Senior Financial Accountant	1	0.934579
84	Senior Manager	2	1.869158
85	Senior Manager Analytics	1	0.934579
86	Senior Manager Balance Sheet Management	1	0.934579
87	Senior Risk Consultant	1	0.934579
88	Statutory Reporting	1	0.934579
89	Strategy Consultant	1	0.934579

```
90 Supervisory and Regulatory Financial Projects Senior Analyst    1 0.934579
4
91                                                 Test Manager    1 0.934579
4
92              Valuations and Financial Modelling Speacialist    1 0.934579
4
93                                    Vice President Innovation    1 0.934579
4
> View(transform(as.data.frame(table(responses$Job_Title)),Frequency=Freq/nro
w(responses)*100))
> library(ggplot2)
> ggplot(responses, aes(x=factor(Gender)), count)+geom_bar(stat="count",
fill="steelblue")+theme_bw()+ggtitle("Respondent
Gender")+geom_text(stat='count',aes(label=..count..),hjust=+1.5,
color="white")+xlab("Gender")+ylab("Number of Responses")+coord_flip()
> responses$EducationPlotSort <- with(responses, reorder(Education,
Education, function(x) +length(x)))
> ggplot(responses, aes(x=factor(EducationPlotSort)),
count)+geom_bar(stat="count",
fill="steelblue")+theme_bw()+ggtitle("Respondent
Education")+geom_text(stat='count',aes(label=..count..),hjust=+1.5,
color="white")+xlab("Education")+ylab("Number of Responses")+coord_flip()
> responses$Years_Org_ExpPlotSort <- with(responses, reorder(Years_Org_Exp,
Years_Org_Exp, function(x) +length(x)))
> ggplot(responses, aes(x=factor(Years_Org_ExpPlotSort)),
count)+geom_bar(stat="count", fill="steelblue")+theme_bw()+ggtitle("Years
Experience with
Organisation")+geom_text(stat='count',aes(label=..count..),hjust=+1.5,
color="white")+xlab("Years")+ylab("Number of Responses")+coord_flip()
> responses$Years_IFRS_ExpPlotSort <- with(responses, reorder(Years_IFRS_Exp,
Years_IFRS_Exp, function(x) +length(x)))
> ggplot(responses, aes(x=factor(Years_IFRS_ExpPlotSort)),
count)+geom_bar(stat="count", fill="steelblue")+theme_bw()+ggtitle("Years
Experience with
IFRS")+geom_text(stat='count',aes(label=..count..),hjust=+1.5,
color="white")+xlab("Years")+ylab("Number of Responses")+coord_flip()
> responses$Country_Respondent_LocationPlotSort <- with(responses,
reorder(Country_Respondent_Location, Country_Respondent_Location, function(x)
+length(x)))
> ggplot(responses, aes(x=factor(Country_Respondent_LocationPlotSort)),
count)+geom_bar(stat="count", fill="steelblue")+theme_bw()+ggtitle("Country
Location of
Respondents")+geom_text(stat='count',aes(label=..count..),hjust=+1.5,
color="white", size=3)+xlab("Country")+ylab("Number of
Respondents")+coord_flip()
> responses$Country_Head_OfficePlotSort <- with(responses,
reorder(Country_Head_Office, Country_Head_Office, function(x) +length(x)))
> ggplot(responses, aes(x=factor(Country_Head_OfficePlotSort)),
count)+geom_bar(stat="count", fill="steelblue")+theme_bw()+ggtitle("Country
Location of Organisation Head
Office")+geom_text(stat='count',aes(label=..count..),hjust=+1.5,
color="white", size=3)+xlab("Country")+ylab("Number of
Respondents")+coord_flip()
> library(Hmisc)
Loading required package: lattice
Loading required package: survival
Loading required package: Formula

Attaching package: 'Hmisc'

The following objects are masked from 'package:base':

    format.pval, round.POSIXt, trunc.POSIXt, units
> library(gdata)
gdata: Unable to locate valid perl interpreter
gdata:
gdata: read.xls() will be unable to read Excel XLS and XLSX files unless the
'perl=' argument is used to specify
gdata: the location of a valid perl intrpreter.
gdata:
```

```
gdata: (To avoid display of this message in the future, please ensure perl is
installed and available on the
gdata: executable search path.)
gdata: Unable to load perl libaries needed by read.xls()
gdata: to support 'XLX' (Excel 97-2004) files.

gdata: Unable to load perl libaries needed by read.xls()
gdata: to support 'XLSX' (Excel 2007+) files.

gdata: Run the function 'installXLSXsupport()'
gdata: to automatically download and install the perl
gdata: libaries needed to support Excel XLS and XLSX formats.

Attaching package: ‘gdata’

The following object is masked from ‘package:Hmisc’:

    combine

The following object is masked from ‘package:stats’:

    nobs

The following object is masked from ‘package:utils’:

    object.size

The following object is masked from ‘package:base’:

    startsWith
> responses$Org_EmployeesPlotSort <- with(responses, reorder(Org_Employees,
Org_Employees, function(x) +length(x)))
> responses$Org_EmployeesPlotSort <-
reorder.factor(responses$Org_EmployeesPlotSort , levels = c("1 - 49
people","50 - 249 people", "250 - 499 people", "500 people or more"))
> ggplot(responses, aes(x=factor(responses$Org_EmployeesPlotSort)),
count)+geom_bar(stat="count", fill="steelblue")+theme_bw()+ggtitle("Number of
Employees in
Organisation")+geom_text(stat='count',aes(label=..count..),hjust=+1.5,
color="white", size=3)+xlab("Number of Employees")+ylab("Number of
Responses")+coord_flip()
> responses$Industry_Sector2 <- with(responses, reorder(Industry_Sector,
Industry_Sector, function(x) +length(x)))
> ggplot(responses, aes(x=factor(responses$Industry_Sector2)),
count)+geom_bar(stat="count", fill="steelblue")+theme_bw()+ggtitle("Industry
Sector of Respondents")+geom_text(stat='count',aes(label=..count..),hjust=-
.6, color="black", size=3)+xlab("Industry Sector")+ylab("Number of
Responses")+coord_flip()
> vendorstats$Vendors <- with(vendorstats, reorder(Vendors, Vendors,
function(x) -length(x)))
> ggplot(vendorstats, aes(x=factor(Vendors)), count)+geom_bar(stat="count",
fill="steelblue")+theme_bw()+ggtitle("IFRS 9 Technology
Vendors")+geom_text(stat='count',aes(label=..count..),vjust=-.7,
color="black", size=3)+xlab("Vendor")+ylab("Number of
Respondents")+theme(axis.text.x=element_text(angle=90,hjust=1,vjust=.25))
> vendorstats$Vendors <- with(vendorstats, reorder(Vendors, Vendors,
function(x) +length(x)))
> ggplot(vendorstats, aes(x=factor(Vendors)), count)+geom_bar(stat="count",
fill="steelblue")+theme_bw()+ggtitle("IFRS 9 Technology
Vendors")+geom_text(stat='count',aes(label=..count..),hjust=-.35,
color="black", size=3)+xlab("Vendor")+ylab("Number of
Responses")+coord_flip()
```

Appendix K: Partial Least Square Descriptive Statistics R Console Log

```
R version 3.4.1 (2017-06-30) -- "Single Candle"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> library(readr)
> responses <- read_csv("C:/Users/Connor Stead/IFRS 9 MRes Thesis/6. Statisti
cal Analysis/SEM PLS Analysis/110817 - 107 Responses/Qualtrics Data Table Exp
ort - Numerical - 020917 - Final Responses SEM PLS - Modified Model.csv")
Parsed with column specification:
cols(
  .default = col_integer()
)
See spec(...) for full column specifications.
> View(responses)
> library(psych)
> describe(responses)
          vars   n mean   sd median trimmed  mad min max range  skew kurtosi
s   se
RELI1        1 107 5.06 1.56      5    5.24 1.48   1   7     6 -1.02     0.4
1 0.15
RELI2        2 107 5.10 1.39      6    5.24 1.48   1   7     6 -1.07     0.6
8 0.13
RELI3        3 107 5.05 1.47      5    5.20 1.48   1   7     6 -0.89     0.3
1 0.14
INTG1        4 107 4.77 1.65      5    4.87 1.48   1   7     6 -0.66    -0.6
2 0.16
INTG2        5 107 4.72 1.69      5    4.83 1.48   1   7     6 -0.67    -0.6
6 0.16
INTG3        6 107 4.59 1.74      5    4.69 1.48   1   7     6 -0.52    -0.8
2 0.17
BDATA1       7 107 5.24 1.57      6    5.46 1.48   1   7     6 -1.15     0.7
7 0.15
BDATA2       8 107 4.78 1.67      5    4.90 1.48   1   7     6 -0.63    -0.5
1 0.16
BDATA3       9 107 4.55 1.67      5    4.63 1.48   1   7     6 -0.42    -0.6
5 0.16
BDATA4      10 107 4.42 1.52      5    4.49 1.48   1   7     6 -0.44    -0.5
3 0.15
BDATA5      11 107 4.75 1.42      5    4.85 1.48   1   7     6 -0.65     0.0
4 0.14
SYSQ1       12 107 4.79 1.49      5    4.87 1.48   1   7     6 -0.60    -0.3
2 0.14
SYSQ2       13 107 4.76 1.51      5    4.85 1.48   1   7     6 -0.58    -0.3
4 0.15
SYSQ3       14 107 4.62 1.59      5    4.69 1.48   1   7     6 -0.42    -0.8
3 0.15
CURR1       15 107 5.13 1.36      5    5.22 1.48   1   7     6 -0.46    -0.2
4 0.13
```

CURR2	16	107	5.14	1.33	5	5.23	1.48	1	7	6	-0.57	-0.13
CURR3	17	107	4.80	1.42	5	4.85	1.48	1	7	6	-0.32	-0.66
ACCU1	18	107	4.70	1.57	5	4.76	1.48	1	7	6	-0.29	-1.01
ACCU2	19	107	4.12	1.50	4	4.18	1.48	1	7	6	-0.22	-0.67
ACCU3	20	107	4.64	1.33	5	4.68	1.48	1	7	6	-0.27	-0.26
INFOQ1	21	107	4.70	1.40	5	4.79	1.48	1	7	6	-0.52	-0.38
INFOQ2	22	107	4.71	1.34	5	4.78	1.48	1	7	6	-0.43	-0.38
INFOQ3	23	107	4.64	1.40	5	4.71	1.48	1	7	6	-0.35	-0.54
DPND1	24	107	4.55	1.66	5	4.61	1.48	1	7	6	-0.34	-0.90
DPND2	25	107	5.07	1.50	5	5.20	1.48	1	7	6	-0.77	0.11
DPND3	26	107	4.43	1.68	5	4.49	1.48	1	7	6	-0.34	-0.72
ASSU1	27	107	4.71	1.62	5	4.82	1.48	1	7	6	-0.53	-0.48
ASSU2	28	107	4.76	1.51	5	4.85	1.48	1	7	6	-0.60	-0.33
ASSU3	29	107	4.93	1.39	5	5.02	1.48	1	7	6	-0.71	0.03
SERVQ1	30	107	4.64	1.51	5	4.70	1.48	1	7	6	-0.40	-0.55
SERVQ2	31	107	4.67	1.61	5	4.77	1.48	1	7	6	-0.47	-0.60
SERVQ3	32	107	4.61	1.47	5	4.69	1.48	1	7	6	-0.46	-0.29
IFRS9PLAN1	33	107	5.15	1.60	6	5.33	1.48	1	7	6	-0.87	-0.05
IFRS9PLAN2	34	107	5.13	1.51	6	5.28	1.48	1	7	6	-0.81	-0.14
IFRS9PLAN3	35	107	5.07	1.54	5	5.22	1.48	1	7	6	-0.75	-0.12
IFRS9PLAN4	36	107	5.13	1.51	6	5.26	1.48	1	7	6	-0.72	-0.23
IFRS9GOVN1	37	107	5.22	1.49	6	5.39	1.48	1	7	6	-0.93	0.03
IFRS9GOVN2	38	107	5.18	1.47	6	5.33	1.48	1	7	6	-0.92	0.00
IFRS9GOVN3	39	107	5.15	1.43	6	5.28	1.48	1	7	6	-0.79	-0.12
IFRS9GOVN4	40	107	4.95	1.46	5	5.07	1.48	1	7	6	-0.78	-0.14
IFRS9PERS1	41	107	4.93	1.55	5	5.08	1.48	1	7	6	-0.81	-0.11
IFRS9PERS2	42	107	4.96	1.43	5	5.07	1.48	1	7	6	-0.70	-0.10
IFRS9PERS3	43	107	4.99	1.41	5	5.11	1.48	1	7	6	-0.88	0.50
IFRS9BDA1	44	107	4.65	1.67	5	4.76	1.48	1	7	6	-0.55	-0.51
IFRS9BDA2	45	107	4.53	1.65	5	4.61	1.48	1	7	6	-0.40	-0.59
IFRS9BDA3	46	107	4.64	1.63	5	4.74	1.48	1	7	6	-0.51	-0.44
IFRS9APP1	47	107	4.95	1.56	5	5.09	1.48	1	7	6	-0.76	-0.16

IFRS9APP2	48	107	5.20	1.47	6	5.36	1.48	1	7	6	-0.85	0.20
0.14												
IFRS9APP3	49	107	5.05	1.56	5	5.21	1.48	1	7	6	-0.77	-0.15
0.15												
IFRS9APP4	50	107	5.36	1.36	6	5.52	1.48	1	7	6	-1.10	1.11
0.13												
IFRS9INTU1	51	107	5.41	1.41	6	5.59	1.48	1	7	6	-1.04	0.40
0.14												
IFRS9INTU2	52	107	5.37	1.44	6	5.57	1.48	1	7	6	-1.17	0.87
0.14												
IFRS9INTU3	53	107	5.36	1.47	6	5.55	1.48	1	7	6	-1.15	0.66
0.14												
IFRS9INTU4	54	107	5.44	1.45	6	5.64	1.48	1	7	6	-1.20	0.84
0.14												
IFRS9COMP1	55	107	5.55	1.39	6	5.74	1.48	1	7	6	-1.20	1.38
0.13												
IFRS9COMP2	56	107	5.73	1.35	6	5.92	1.48	1	7	6	-1.33	1.80
0.13												
IFRS9COMP3	57	107	5.44	1.51	6	5.64	1.48	1	7	6	-0.99	0.39
0.15												
IFRS9COMP4	58	107	5.54	1.39	6	5.72	1.48	1	7	6	-1.14	1.16
0.13												
BENEFIT1	59	107	5.22	1.31	6	5.33	1.48	1	7	6	-0.79	0.25
0.13												
BENEFIT2	60	107	5.08	1.27	5	5.16	1.48	1	7	6	-0.68	0.25
0.12												
BENEFIT3	61	107	4.47	1.51	4	4.48	1.48	1	7	6	-0.18	-0.67
0.15												
BENEFIT4	62	107	4.33	1.56	4	4.32	1.48	1	7	6	-0.10	-0.81
0.15												
BENEFIT5	63	107	4.83	1.42	5	4.91	1.48	1	7	6	-0.39	-0.13
0.14												

Appendix L: Organisational Revenue R Console Log

```
R version 3.4.1 (2017-06-30) -- "Single Candle"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> library(readr)
> responses <- read_csv("C:/Users/Connor Stead/IFRS 9 MRes Thesis/6.
Statistical Analysis/Descriptive Statistics/110817 - 107 Responses/Qualtrics
Data Table Export - Choice Text - 110817 - Final 107 - Descriptive
Statistics.csv")
Parsed with column specification:
cols(
  Gender = col_character(),
  Age = col_integer(),
  Education = col_character(),
  Years_Org_Exp = col_character(),
  Years_IFRS_Exp = col_character(),
  Job_Title = col_character(),
  Org_IS_Impacted1 = col_character(),
  Org_IS_Impacted2 = col_character(),
  Org_IS_Impacted3 = col_character(),
  Org_IS_Impacted4 = col_character(),
  Org_IS_Impacted5 = col_character(),
  Vendors = col_character(),
  Country_Respondent_Location = col_character(),
  Country_Head_Office = col_character(),
  Org_Employees = col_character(),
  Industry_Sector = col_character(),
  Org_Revenue_Currency = col_character(),
  Org_Revenue_Value = col_character(),
  Thoughts = col_character()
)
> Parsed with column specification:
Error: unexpected symbol in "Parsed with"
>     cols(
+         Gender = col_character(),
+         Age = col_integer(),
+         Education = col_character(),
+         Years_Org_Exp = col_character(),
+         Years_IFRS_Exp = col_character(),
+         Job_Title = col_character(),
+         Org_IS_Impacted1 = col_character(),
+         Org_IS_Impacted2 = col_character(),
+         Org_IS_Impacted3 = col_character(),
+         Org_IS_Impacted4 = col_character(),
+         Org_IS_Impacted5 = col_character(),
+         Vendors = col_character(),
+         Country_Respondent_Location = col_character(),
+         Country_Head_Office = col_character(),
+         Org_Employees = col_character(),
+         Industry_Sector = col_character(),
+         Org_Revenue_Currency = col_character(),
+         Org_Revenue_Value = col_character(),
+         Thoughts = col_character()
+     )
cols(
  Gender = col_character(),
```

```
  Age = col_integer(),
  Education = col_character(),
  Years_Org_Exp = col_character(),
  Years_IFRS_Exp = col_character(),
  Job_Title = col_character(),
  Org_IS_Impacted1 = col_character(),
  Org_IS_Impacted2 = col_character(),
  Org_IS_Impacted3 = col_character(),
  Org_IS_Impacted4 = col_character(),
  Org_IS_Impacted5 = col_character(),
  Vendors = col_character(),
  Country_Respondent_Location = col_character(),
  Country_Head_Office = col_character(),
  Org_Employees = col_character(),
  Industry_Sector = col_character(),
  Org_Revenue_Currency = col_character(),
  Org_Revenue_Value = col_character(),
  Thoughts = col_character()
)
> View(responses)
> revenue <- data.frame(responses$Org_Revenue_Currency, responses$Org_Revenue
_Value)
> colnames(revenue) <- c("currency", "value")
> View(revenue)
> revenue$currency <- substr(revenue$currency, 0, 3)
> View(revenue)
> revenue_missing_removed <- subset( revenue, !is.na(currency) & !is.na(value
))
> View(revenue_missing_removed)
> require(dfCurrencyConvert)
> revenue_convertedUSD <- col_currency_convert(revenue_missing_removed, "curr
ency", "value", to = "USD")
 [1] "Currency Converted @  Sat Sep 02 08:52:56 2017"
> View(revenue_convertedUSD)
> View(revenue_convertedUSD)
> library(psych)
> describe(revenue_convertedUSD$converted_USD)
   vars  n        mean          sd    median    trimmed       mad      min
X1    1 86 21476800244 92875046865 468322229 4721850567 692234160 32158.82
            max        range skew kurtosis          se
X1 800000000000 799999967841 7.14    55.09 10014973865
> revenue_problematic_removed <- subset( revenue_convertedUSD, converted_USD
!= 800000000000.00)
> View(revenue_problematic_removed)
> describe(revenue_problematic_removed$converted_USD)
   vars  n        mean          sd    median    trimmed
X1    1 85 12317703777 37790442924 436644458 4297529561
         mad      min          max         range skew kurtosis
X1 645145173 32158.82 237238074339 237238042180 5.05    26.71
           se
X1 4098949042
> nrow(subset( revenue, !is.na(currency) & !is.na(value)))
[1] 86
> nrow(revenue_convertedUSD)
[1] 86
```

Appendix M: Job Title Response and Category R Console Log

```
R version 3.4.1 (2017-06-30) -- "Single Candle"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> library(readr)
> responses <- read_csv("C:\Users\Sushi\Dropbox\Connors MRes Thesis\6.
Statistical Analysis\Descriptive Statistics\110817 - 107 Responses/Qualtrics
Data Table Export - Choice Text - 110817 - Final 107 - Descriptive
Statistics.csv")
Parsed with column specification:
cols(
  Gender = col_character(),
  Age = col_integer(),
  Education = col_character(),
  Years_Org_Exp = col_character(),
  Years_IFRS_Exp = col_character(),
  Job_Title = col_character(),
  Org_IS_Impacted1 = col_character(),
  Org_IS_Impacted2 = col_character(),
  Org_IS_Impacted3 = col_character(),
  Org_IS_Impacted4 = col_character(),
  Org_IS_Impacted5 = col_character(),
  Vendors = col_character(),
  Country_Respondent_Location = col_character(),
  Country_Head_Office = col_character(),
  Org_Employees = col_character(),
  Industry_Sector = col_character(),
  Org_Revenue_Currency = col_character(),
  Org_Revenue_Value = col_character(),
  Thoughts = col_character()
)
> Parsed with column specification:
Error: unexpected symbol in "Parsed with"
>     cols(
+         Gender = col_character(),
+         Age = col_integer(),
+         Education = col_character(),
+         Years_Org_Exp = col_character(),
+         Years_IFRS_Exp = col_character(),
+         Job_Title = col_character(),
+         Org_IS_Impacted1 = col_character(),
+         Org_IS_Impacted2 = col_character(),
+         Org_IS_Impacted3 = col_character(),
+         Org_IS_Impacted4 = col_character(),
+         Org_IS_Impacted5 = col_character(),
+         Vendors = col_character(),
+         Country_Respondent_Location = col_character(),
+         Country_Head_Office = col_character(),
+         Org_Employees = col_character(),
+         Industry_Sector = col_character(),
+         Org_Revenue_Currency = col_character(),
+         Org_Revenue_Value = col_character(),
+         Thoughts = col_character()
+     )
cols(
  Gender = col_character(),
  Age = col_integer(),
```

```
  Education = col_character(),
  Years_Org_Exp = col_character(),
  Years_IFRS_Exp = col_character(),
  Job_Title = col_character(),
  Org_IS_Impacted1 = col_character(),
  Org_IS_Impacted2 = col_character(),
  Org_IS_Impacted3 = col_character(),
  Org_IS_Impacted4 = col_character(),
  Org_IS_Impacted5 = col_character(),
  Vendors = col_character(),
  Country_Respondent_Location = col_character(),
  Country_Head_Office = col_character(),
  Org_Employees = col_character(),
  Industry_Sector = col_character(),
  Org_Revenue_Currency = col_character(),
  Org_Revenue_Value = col_character(),
  Thoughts = col_character()
)
> View(responses)
> transform(as.data.frame(table(responses$Job_Title)),Frequency=Freq/nrow(res
ponses)*100)
                                                                  Var1 Freq Frequenc
y
1                                                          Accountant    1 0.934579
4
2                                 Accountant IFRS Technical Team Lead    1 0.934579
4
3                                                   Accounting Audit    1 0.934579
4
4                                                  Accounting Director    1 0.934579
4
5                                                   Assistant Manager    1 0.934579
4
6                                                Assistant Manager Finance    1 0.934579
4
7                                Assistant Manager Financial Risk Consulting    1 0.934579
4
8                                                 Assistant Vice President    1 0.934579
4
9                                                           Associate    1 0.934579
4
10                                               Associate Vice President    1 0.934579
4
11                                                    Audit Manager    1 0.934579
4
12                                                  Audit Supervisor    1 0.934579
4
13                                                  Business Analyst    1 0.934579
4
14                                       Capital and Impairment Analyst    1 0.934579
4
15                                                              CFO    1 0.934579
4
16                                             Chief Manager Finance    1 0.934579
4
17                                           Chief Operations Officer    1 0.934579
4
18                                                  Chief Risk Officer    2 1.869158
9
19                                                  Compliance officer    1 0.934579
4
20                                                          Consultant    2 1.869158
9
```

21	Consultant or Business Analyst	1	0.934579
22	Consultant Risk Management	1	0.934579
23	Consulting Technical Director	1	0.934579
24	Credit Risk Analyst	1	0.934579
25	Credit Risk Executive	1	0.934579
26	Credit Risk Portfolio Manager	1	0.934579
27	Credit Risk Reporting Specialist	1	0.934579
28	Data Analyst	1	0.934579
29	Deputy General Manager of Risk Management	1	0.934579
30	Director	1	0.934579
31	Director Advanced Analytics	1	0.934579
32	Director Advisory Services	1	0.934579
33	Director Consulting	1	0.934579
34	Director of Technology Risk	1	0.934579
35	Director Product Control	1	0.934579
36	Economist	1	0.934579
37	Executive Director	2	1.869158
38	Executive Vice President	1	0.934579
39	External Auditor	1	0.934579
40	Finance Executive Officer	1	0.934579
41	Financial Accounting and Advisory Senior Consultant	1	0.934579
42	Financial Controller	1	0.934579
43	Financial Risk Manager	1	0.934579
44	Financial Risk Managment Consultant	1	0.934579
45	Global SME Lead for Expected Credit Losses	1	0.934579
46	Group Senior Accountant Treasury and Investment Accounting	1	0.934579
47	Head Financial Control and Treasury	1	0.934579
48	Head of Accounting and Controlling Division	1	0.934579
49	Head of Credit Analytics	1	0.934579
50	Head of Credit Portfolio Risk	1	0.934579
51	Head of Credit Risk Models Department	1	0.934579
52	Head of Risk Finance and Data Quality IT Solutions	1	0.934579

53	Head of Risk IT	1	0.934579
54	IFRS Accounting Coordinator	1	0.934579
55	IFRS Analyst	1	0.934579
56	IFRS Consultant	1	0.934579
57	IFRS Nine Analyst	1	0.934579
58	IFRS Specialist	1	0.934579
59	Impairment Officer	2	1.869158
60	Innovation officer	1	0.934579
61	Lead Consultant	1	0.934579
62	Management Consultant and Software Consultant	1	0.934579
63	Manager	3	2.803738
64	Manager IFRS Nine Programme	1	0.934579
65	Market Risk and Liquity Risk Controller	1	0.934579
66	MBA	1	0.934579
67	Principal Bank Examiner	1	0.934579
68	Product Officer	1	0.934579
69	Programme Director	1	0.934579
70	Project Consultant	1	0.934579
71	Project Manager	2	1.869158
72	Risk Analyst	4	3.738317
73	Risk Manager	2	1.869158
74	Risk Modelling Analyst	1	0.934579
75	Sales Manager	1	0.934579
76	Senior Advisor	1	0.934579
77	Senior Annual Financial Statement Drafting Specialist	1	0.934579
78	Senior Consultant	3	2.803738
79	Senior Consultant Risk Advisory	1	0.934579
80	Senior Consultant Risk Domain Expert	1	0.934579
81	Senior Expert Account Policy	1	0.934579
82	Senior Finance Manager	1	0.934579
83	Senior Financial Accountant	1	0.934579
84	Senior Manager	2	1.869158

```
85                                     Senior Manager Analytics    1 0.934579
4
86                       Senior Manager Balance Sheet Management    1 0.934579
4
87                                       Senior Risk Consultant    1 0.934579
4
88                                          Statutory Reporting    1 0.934579
4
89                                          Strategy Consultant    1 0.934579
4
90 Supervisory and Regulatory Financial Projects Senior Analyst    1 0.934579
4
91                                                Test Manager    1 0.934579
4
92                 Valuations and Financial Modelling Speacialist    1 0.934579
4
93                                    Vice President Innovation    1 0.934579
4
> write.excel(transform(as.data.frame(table(responses$Job_Title)),Frequency=F
req/nrow(responses)*100))
> read.excel <- function(header=TRUE,...) {
+     read.table("clipboard",sep="\t",header=header,...)
+ }
> read.excel()
                                                    Job.Title   Category
1                                                Risk Analyst       Risk
2                                             Senior Consultant Consultant
3                                                       Manager Management
4                                                    Consultant Consultant
5                                              Executive Director Management
6                                                 Project Manager Management
7                                                  Senior Manager Management
8                                              Chief Risk Officer       Risk
9                                              Impairment Officer       Risk
10                                                 Risk Manager       Risk
11                                                Audit Manager      Audit
12                                              Audit Supervisor      Audit
13                                             Compliance officer      Audit
14                                               External Auditor      Audit
15                                  Consultant or Business Analyst Consultant
16                                      Consultant Risk Management Consultant
17                                   Consulting Technical Director Consultant
18          Financial Accounting and Advisory  Senior Consultant Consultant
19                              Financial Risk Managment Consultant Consultant
20                                           IFRS Consultant Consultant
21                                           Lead Consultant Consultant
22                   Management Consultant and Software Consultant Consultant
23                                         Project Consultant Consultant
24                                  Senior Consultant Risk Advisory Consultant
25                               Senior Consultant Risk Domain Expert Consultant
26                                         Senior Risk Consultant Consultant
27                                            Strategy Consultant Consultant
28                                                     Accountant    Finance
29                              Accountant IFRS Technical Team Lead    Finance
30                                             Accounting Audit    Finance
31                                           Accounting Director    Finance
32                                        Assistant Manager Finance    Finance
33                                                            CFO    Finance
34                                         Chief Manager Finance    Finance
35                                        Finance Executive Officer    Finance
36                                             Financial Controller    Finance
37   Group Senior Accountant Treasury and Investment Accounting    Finance
38                                Head Financial Control and Treasury    Finance
39                     Head of Accounting and Controlling Division    Finance
```

```
40                                    IFRS Accounting Coordinator    Finance
41                                                IFRS Analyst    Finance
42                                             IFRS Nine Analyst    Finance
43                                               IFRS Specialist    Finance
44          Senior Annual Financial Statement Drafting Specialist    Finance
45                                     Senior Expert Account Policy    Finance
46                                           Senior Finance Manager    Finance
47                                     Senior Financial Accountant    Finance
48                         Senior Manager Balance Sheet Management    Finance
49                                            Statutory Reporting    Finance
50 Supervisory and Regulatory Financial Projects Senior Analyst    Finance
51                  Valuations and Financial Modelling Speacialist    Finance
52                                     Director of Technology Risk         IT
53             Head of Risk Finance and Data Quality IT Solutions         IT
54                                              Head of Risk IT         IT
55                                                 Test Manager         IT
56                                           Assistant Manager Management
57                                      Assistant Vice President Management
58                                      Associate Vice President Management
59                                      Chief Operations Officer Management
60                                                      Director Management
61                                     Director Advanced Analytics Management
62                                      Director Advisory Services Management
63                                             Director Consulting Management
64                                      Director Product Control Management
65                                      Executive Vice President Management
66                                            Innovation officer Management
67                                     Manager IFRS Nine Programme Management
68                                                 Product Officer Management
69                                           Programme Director Management
70                                                Sales Manager Management
71                                                Senior Advisor Management
72                                      Senior Manager Analytics Management
73                                     Vice President Innovation Management
74                                                    Associate      Other
75                                              Business Analyst      Other
76                                                  Data Analyst      Other
77                                                     Economist      Other
78                                                           MBA      Other
79                                       Principal Bank Examiner      Other
80                         Assistant Manager Financial Risk Consulting       Risk
81                                 Capital and Impairment Analyst       Risk
82                                            Credit Risk Analyst       Risk
83                                          Credit Risk Executive       Risk
84                                  Credit Risk Portfolio Manager       Risk
85                                Credit Risk Reporting Specialist       Risk
86                          Deputy General Manager of Risk Management       Risk
87                                          Financial Risk Manager       Risk
88                         Global SME Lead for Expected Credit Losses       Risk
89                                        Head of Credit Analytics       Risk
90                                     Head of Credit Portfolio Risk       Risk
91                           Head of Credit Risk Models Department       Risk
92                          Market Risk and Liquity Risk Controller       Risk
93                                          Risk Modelling Analyst       Risk
> job_title_categorised <- read.excel()
> View(job_title_categorised)
> transform(as.data.frame(table(job_title_categorised$Category)),Frequency=Fr
eq/nrow(responses)*100)
        Var1 Freq Frequency
1      Audit    4  4.301075
2 Consultant   15 16.129032
3    Finance   24 25.806451
4         IT    4  4.301075
5 Management   22 23.655913
```

```
6      Other    6  6.451612
7       Risk   18 19.354838
> write.excel(transform(as.data.frame(table(job_title_categorised$Category)),
Frequency=Freq/nrow(responses)*100))
```

Appendix N: Respondent and Head Office Location R Console Log

```
R version 3.4.1 (2017-06-30) -- "Single Candle"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> library(readr)
> responses <- read_csv("C://Users//Connor Stead//IFRS 9 MRes Thesis//6. Stat
istical Analysis//Descriptive Statistics//110817 - 107 Responses//Qualtrics D
ata Table Export - Choice Text - 110817 - Final 107 - Descriptive Statistics.
csv")
Parsed with column specification:
cols(
  Gender = col_character(),
  Age = col_integer(),
  Education = col_character(),
  Years_Org_Exp = col_character(),
  Years_IFRS_Exp = col_character(),
  Job_Title = col_character(),
  Org_IS_Impacted1 = col_character(),
  Org_IS_Impacted2 = col_character(),
  Org_IS_Impacted3 = col_character(),
  Org_IS_Impacted4 = col_character(),
  Org_IS_Impacted5 = col_character(),
  Vendors = col_character(),
  Country_Respondent_Location = col_character(),
  Country_Head_Office = col_character(),
  Org_Employees = col_character(),
  Industry_Sector = col_character(),
  Org_Revenue_Currency = col_character(),
  Org_Revenue_Value = col_number(),
  Thoughts = col_character()
)
> responses$Country_Head_Office[responses$Country_Head_Office == "Same Countr
y as Head Office"] <- responses$Country_Respondent_Location[responses$Country
_Head_Office == "Same Country as Head Office"]
> responses$Country_Head_Office[responses$Country_Head_Office == "United Stat
es of America"] <- "United States"
> responses$Country_Respondent_Location[responses$Country_Respondent_Location
== "United States of America"] <- "United States"
> library(maptools)
> respondentLocationCleaned = wrld_simpl@data$NAME %in% responses$Country_Res
pondent_Location
> headofficeLocationCleaned = wrld_simpl@data$NAME %in% responses$Country_Hea
d_Office
> plot(wrld_simpl, col = c(gray(.80), "green")[respondentLocationCleaned+1])
> plot(wrld_simpl, col = c(gray(.80), "orange")[headofficeLocationCleaned+1])
```