**The impact of organisational culture on organisational innovation in the
South African State-Owned Entities**

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Abstract

Innovation has been proven to be one of the crucial ingredients for organisational success. Factors influencing innovation include organisational culture. Although a wealth of research has been conducted on the impact of organisational culture on organisational innovation, the relationship between passive, aggressive and constructive organisational cultural styles and innovation strategy and employee innovation needs to be clarified, particularly in South African State-Owned Enterprises. Therefore, a cross-sectional quantitative study was conducted to address the research gap.

An investigation to determine this relationship was conducted. A questionnaire was used to collect data from the South African State-Owned Enterprises employees, and 170 individuals responded. While aggressive culture does not affect organisational innovation, the results revealed that passive and constructive cultural styles significantly impact organisational innovation in the SA SOEs.

While organisational culture is a determinant of organisational innovation, the study did not reveal how employees of different age groups and position levels perceive it. Moreover, as the study was cross-sectional, the sample size was suitable for the study; however, small relative to the magnitude of SOEs' employment in South Africa. In addition, more cultural dimensions are forming as the business environment, the work boundaries, and Information, Communication and Technology evolve. These were the study's limitations that left room for future research.

Declaration

I declare that this research project is my work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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Abbreviations and acronyms

ANOVA	Analysis of variance
BRICS	Brazil, Russia, India, China and South Africa
CB-SEM	Covariance Based-Structural Equation Modeling
CEO	Chief Executive officers
CFA	Confirmatory Factor Analysis
CIPC	Intellectual Property Commission
CFV	Competing Values Framework
CSV	Comma Separated Values
DBSA	Development Bank of Southern Africa
EFA	Exploratory Factor Analysis
GDP	Gross Domestic Product
ICT	Information, Communication, and Technology
IMF	International Monetary Fund
IPO	Initial Public Offerings
KMO	Kaiser-Meyer-Olkin
MENA	The Middle East and North Africa
NCOP	National Council of Provinces
OC	Organisational Culture
OECD	The Organization for Economic Cooperation and Development
OI	Organisational Innovation
PCA	Principal Components Analysis
PLS-SEM	Partial Least Squares Structural Equation Modeling
POE	Privately-Owned Enterprises
PWC	PricewaterhouseCoopers
R&D	Research & Development
SA	South Africa
SAA	South African Airways
SABC	South African Broadcasting Corporation
SEM	Structural Equation Modeling
SOE	State-Owned Enterprise
SPSS	Statistical Package for Social Science
VIF	Variance Inflator Factor
SAFCOL	South African Forestry Company SOC Limited

Outline for the study

- Chapter 1: Purpose of the study

- Chapter 2: Literature review

- Chapter 3: Research objective and hypotheses

- Chapter 4: Research methodology

- Chapter 5: Analysis of the results

- Chapter 6: Discussion of findings

- Chapter 7: Conclusions and recommendations

Chapter 1: Introduction

1.1. Introduction to the problem

This study focuses on understanding organisational culture's impact on organisational innovation in South African (SA) State-Owned Entities (SOEs). Literature offers some views on SOEs, especially regarding their organisational culture and the need for organisational innovation.

SOEs are legal entities formed by the state and could be partially or wholly owned to engage in specific commercial activities and realise their objectives related to particular social outcomes and public service (Kenton & Potters, 2020; Putra et al., 2020). These organisations account for a considerable portion of the country's employment, market capitalisation and investment. They play an influential role and remain relevant due to their significant feature in the country's vital economic sectors, namely, energy, mining, infrastructure, and transport (PricewaterhouseCoopers [PWC], 2015; Maisonnave et al., 2021; Landoni, 2020; Clò et al., 2016).

The major SOEs under the Department of Public Enterprises (DPE) 's oversight face constant operational and financial adversity among all SA SOEs, which makes their practicality and survival questionable. For example, in the 2019 budget speech, the finance minister concluded that the considerable economic activity decline in the first quarter of the year was mainly due to the financial challenges of the SOEs (Mboweni, 2019). Additionally, The Research and Markets, as reported by Haffejee (2021) and Cision PR Newswire (2021), stipulated that, in the 2021 financial year, SA SOEs recorded a debt of R693billion.

The report further stated that most SOEs face a risk of being unable to service this debt due to the increasing debt servicing costs. Moreover, it is indicated in the budget review that SA SOEs reported poor growth and incurred high costs accompanied by lesser to no returns (Cision PR Newswire, 2021). This discussion highlights the effects of poor-performing and inefficient SOEs, and the following will discuss the large-scale results of these effects. The following section zooms into some recent and current challenges facing the SA SOEs.

Ms Mokause, a member of the National Council of Provinces (NCOP), expressed her dismay in the parliament news that SA SOEs operations have curtailed economic development. Ms Mokause continued to mention Denel as a previously highly

innovative organisation, and now it cannot pay workers' salaries. Moreover, Transnet's profit-making turned into a woeful R2billion loss, South African Airways (SAA) 's repeated failures, South African Broadcasting Corporation (SABC) 's worst state of incompetence, Eskom's financial losses, debt, and failure to promise a consistent energy supply. From that understanding, many factors could be attributed to the appalling state of the SOEs (Mputing,2021). This highlights some of the challenges facing the SA SOEs, and there is no obvious factor that one can identify as the overall cause.

The crisis at the SOEs creates a ripple effect on the country's economic performance. Due to the economic role played by the SOEs, their inefficiencies and reduced performance cause negative spill-overs, including decreasing national income and economic growth, increasing unemployment, and reduced household income and subsequently increased poverty (Chitiga-Mabugu et al., 2022). Therefore, for these organisations to address the repercussions of the prevalent crisis, it is crucial to explore their organisational culture and how it affects their members' willingness and ability to innovate. This is because innovation keeps organisations relevant, competitive, and adaptable, and its further importance for market participation is discussed in the following section.

The essence of organisational innovation is to promote the quality of work through firm efficiency, performance, and how a company uses new information, technology, learning ability, and information exchange (Haar, 2018; Kashan et al., 2021). Innovation is a dynamic capacity that enables employees to generate ideas collectively, develop products and services, and successfully market them to intensify the propensity to stay adaptable to industry and organisational changes (Tian et al., 2018; Ramírez et al., 2017; Edwards-Schachter, 2018). Moreover, from that perspective, firms can produce existing goods more efficiently by developing new processes. Therefore, for SOEs to remain sustainable, they should develop, enhance, and sustain a competitive edge by upgrading their resource capabilities to be agile and adaptable to market trends and changes through enhancing organisational innovation (Li et al., 2007).

Edwards-Schachter (2018) conceptualises innovation as an interactive process among individuals with heterogeneous skills or organisations with heterogeneous capabilities that develop over time. However, some authors have indicated that most SOEs lack market experience, are inefficient, and innovation in those organisations

increases once they are privatised (Radić et al., 2021; Putra et al., 2020). To confirm that, Castelnovo (2022) found that Privately Owned Entities (POEs) innovation output outperforms that of the SOEs, even after stating the three arguments that the involvement of the supporters of the state has on innovation:

i) Compared to the POEs with a leading profit maximisation objective, SOEs have no immediate need for return on investment. This is because SOEs are not focused on making profits, thus no urgency to innovate. Meanwhile, POEs seek short-term value and knowledge to create economic returns when investing in innovation.

ii) The authors further posited that the state invests in risky projects and funds uncertain stages of research, which demotivates the POEs.

iii) Government has a more flexible budget which is not affected by business cycles for Research and Development (R&D) than POEs.

The last two arguments deem SOEs financially advantaged, which could encourage them to pursue innovative activities; however, POEs remain more efficient and innovative than SOEs.

An additional reason for SOEs to slack is that; employees do not have adequate autonomy and flexibility to innovate because their ownership structure and management capacity are constrained, and managers lack incentives to pursue innovation, resulting in inefficiency (Zang et al., 2020; Benassi & Landoni, 2019). Furthermore, due to states' lack of transparency and operational strategy, SOEs were observed by Tajeddini and Trueman (2016) to suffer from the state's inefficiency. Furthermore, to confirm that, Mbo and Adjasi (2017) found that SOEs' poor performance and inefficiencies were due to a high level of political interference and government involvement, thus naming this a common predicament facing SOEs.

Furthermore, to address the lack of autonomy regarding enhancing innovation efficiency, Landoni (2020) suggested that SOEs coordinate with external institutions to ensure alignment and mutual reinforcement of their strategies concerning the government innovation policy. Due to SOEs being structured like companies, they combine agile methods with governance frameworks, which disadvantages external institutions like public research hubs and academic institutions. Therefore, external collaborations could provide advantages over private firms by ensuring preferred

access to government networks and, as a result, better access to public innovation networks (Landoni, 2020).

According to survey results from The public sector research centre (2015), bribery, corruption issues, and inefficiency were the SOEs' Chief Executive officers (CEOs) leading concerns. In addition to those leading issues, the McKinsey poll found that 84% of global organisational leaders prioritise and rely on innovation as a driver of growth strategies; however, 94% of global leaders reported their frustration and dissatisfaction with innovation in their organisations (Christensen et al., 2016).

The following is an example that indicates that SOEs in developing countries lag in innovation. According to Bhatta (2018), SOEs in developing countries, including India, South Africa, and China, have not been keen to collaborate with other countries, reducing their chances of developing new technologies. On the other hand, SOEs in developed countries, such as the USA, Israel, and some European countries, have collaborated with other countries and joined their budgets to enhance research, leading to better product development (Bhatta, 2018). Therefore, this indicates SOEs' poor performance regarding innovation due to their limited managerial autonomy and flexibility.

The discussions above clarify the need for SOEs to embrace and drive competitiveness through organisational innovation. However, having considered organisational innovation, its role and importance in SOEs and their need to stay relevant. It is also important to briefly highlight the other critical elements for consideration in this study, which may impact organisational innovation, that being, organisational culture.

Organisational culture directs firms' activity execution by defining values and assumptions that guide how employees should behave in different situations while interacting with various stakeholders (Ravasi & Schultz, 2006; Schrodt, 2009). Linking that to innovation in SOEs, Belloc (2014) mentioned the reasons for SOEs' lower efficiency and disinterest in innovation investment as organisational culture, level of political competition and legislation. Another reason is that the government shelters SOEs from the competition to remain in legal monopolistic positions, prohibiting POEs from entering the industry. Therefore, their innovation efficiency is perceived to be less than that of private companies, and under incomplete

information, innovation is how entities respond to competition (Castelnovo, 2022; Belloc, 2014; Landoni, 2020; Bruton et al., 2015).

In addition to those reasons, Chen et al. (2018) posited that SOEs' management struggles with reconciling various resources to respond to competition and rapid changes in the market. In addition, employees' fear of failure and a high degree of job security, accompanied by rigid approval and procurement procedures by governmental regulation, are among other obstacles Bhatta (2018) found to be challenging organisational innovation for the SOEs.

The discussions above highlighted organisational culture as part of the aspects that impede organisational innovation. Thus, organisational culture is often an appropriate approach to explain incomparable actions such as organisational innovation due to its ability to foster collaboration, sensemaking, and perspective-taking (Murphy et al., 2013; Ramadista & Kismono, 2020). Furthermore, Reisyan (2016) asserted that some countries in the India, Brazil, China, Russia, and South Africa (BRICS) group and other places in the world have not yet found the fine-tuned culture that induces and supports innovation and performance. From that thinking, companies require an organisational culture suitable for continuous innovation, as organisational culture determines sustainable innovation (Bayhan & Korkmaz, 2021).

Nguyen et al. (2019) cited Hofstede and Hofstede's (2005) definition of organisational culture as organisational members' distinct way of thinking and behaving when conducting their duties, in other words, a mental software of an organisation. This mental software will have some impact on organisational innovation. However, it is to be noted that organisational culture is a broad concept; therefore, this study's focus is on the passive, aggressive, and constructive organisational cultural styles and how they affect organisational innovation. These different cultural settings as broadly defined by Bolcas and Ionescu (2019):

- In a passive organisational culture, members are likely to act in a way that pleases their superiors because they are compelled to behave and think inconsistently with what they believe renders them effective. Members satisfy bosses to avoid conflict.
- An aggressive organisational culture propels members to believe they can succeed in an organisation by enhancing their status and security and

performing better than others. Members are driven by, among others, safety and esteem needs from Maslow's hierarchy of needs.

- In a constructive organisational culture, members create an environment that ensures they develop, satisfy and value one another while executing strategies. Members are driven by value-adding factors such as fulfilment, teamwork, and goal attainment.

1.2. Problem statement

This study explores how passive, aggressive, and constructive organisational cultures affect employees' ability to be innovative, thus impacting organisational innovation. Organisational culture is an organisation's approach to achieving its objectives and is a foundation of sharing base values (Tian et al., 2018).

It is the leaders' responsibility to ensure that the culture within the space of work is conducive for employees to perform at their maximised potential. Thus, members should be able to recognise and articulate the specific organisational culture.

Armenakis et al. (2011) state that leaders create, transform and endorse organisational culture. However, "The challenge for leaders is to see culture up-close as they are accustomed to their perspective of what culture is" (Hollister et al., 2021, p.2). Also, transforming an organisational culture takes time and requires dedication. The literature suggests that leaders often struggle to articulate their aspired organisational culture and bring it to life (Jurisic et al., 2020). In addition, according to Ramírez et al. (2017), cultural elements affect organisational innovation; however, it is uncertain which cultural assumptions influence organisational innovation.

1.3. Rationale of the study

This study leans on existing theory and seeks to expand on the theory, specifically in relation to SOEs. This study thus sought to enhance knowledge of the organisational culture by focusing on the Cooke and Lafferty (1987) model. Discussion around the theory is explored in Chapter 2, and the following discussion is on the theoretical and business rationale.

1.3.1. Theoretical rationale

According to Tian et al. (2018), additional research is required to investigate how organisational culture affects organisational innovation in multinational corporations, the type of corporate culture that encourages innovation, and how employees with heterogeneous cultures accept a homogenous culture. Furthermore, in most of the literature, organisational culture and innovation are studied with a focus on the Cameron and Quinn (2006) model of the four value sets, which looks at culture from four dimensions: adhocracy, clan, hierarchy, and market.

This study seeks to enhance knowledge of the organisational culture by focusing on the Cooke and Lafferty (1987) model. However, Shayah and Zehou (2019) confirmed that supplementary studies focusing on how other models of cultural values affect innovation is required. Therefore, additional studies on the passive, aggressive, and constructive organisational cultures and how they affect innovation, are necessary as there is limited literature on the research problem, particularly in the South African SOEs context. Scaliza et al. (2022) further emphasised that future studies could expand the literature on organisational culture and innovation in industrial and other sectors and other countries.

According to the Organisation for Economic Cooperation and Development [OECD] (2015), Intense research has been undertaken in developed countries' SOEs. To note, too, researchers use China's SOEs as a benchmark for developing countries as it is a state-managed economy; however, as far as the innovation analysis is concerned, further studies need to be conducted, especially from the state-centric viewpoint (Tõnurist, 2015). Furthermore, although there is research on controlled economies' SOEs, such as China as a developing country, it cannot be applied to other developing countries, such as South Africa, Brazil, and India (Bhatta, 2018). Therefore, this research could shed light on how SOEs perform regarding innovation and how they perceive organisational culture besides basing it on the written values, vision, and strategic intent.

1.3.2. Business rationale

In addition to the theoretical rationale, the study aimed to determine some insights that could benefit the business environment. To that end, for an organisation to have a clear vision of its strategic implementation, it should be able to understand its culture, as culture is an essential ingredient of the roadmap to goal attainment. This

indicates that an organisation should be able to articulate its culture so that all members understand and effortlessly immerse themselves in it. According to Lekgothoane et al. (2020), organisational culture in the SA SOEs is either hostile, with results that stifle creative thinking or unified, which results in respect and cohesiveness. As indicated in the research problem above, culture is invisible to its inhabitants. Thus, this research will assist SOEs in gaining a clear understanding of their respective cultures and how they affect the implementation of chosen strategies, particularly those aligned with organisational innovation.

Although the main objective of SOEs is not to maximise profits but to satisfy the needs of the public, innovation remains an enabler for organisations to sustain their value proposition and stay competitive as the private sector provides similar offerings. From this study, organisations will gain insight into which cultural attributes to enhance, alter, and leave unchanged to arrange, rearrange or develop their resource capabilities to have a goal-driven strategic implementation zeal with an innovative trajectory.

Literature offers studies on organisational culture in conjunction with business models, organisational structures, strategies, and technologies. These elements change in response to the external environment and create intricacies that affect culture. (Murphy et al., 2013). For example, the hybrid office was introduced to the business world and continues to grow. While recognising and appreciating the changing elements enabling this phenomenon, it is critical to remember that the office is not only for work but also for social networks and spontaneous collective creative thinking triggered by shared human moments. Furthermore, remote work has affected implicit knowledge sharing within organisations, particularly the new employees who expect to experience culture directly (Fayard et al., 2021).

Furthermore, SOEs' workforce comprises members of different age groups, such as Millennials, Generation X, and Generation Z, who have different work styles and view organisations and authority differently (Smith, 2021). This study is undertaken when organisational culture, in general, is shifting due to changing workspaces from physical to remote and hybrid offices and where the workplace is a composite of the various generational workforce. The altering of cultural artefacts, shared values, and assumptions from this study will shed knowledge on the business environment, particularly human behaviour aspects such as culture and organisational innovation.

1.4. Purpose statement

This study focused on South African SOEs and investigated the impacts of passive, aggressive, and constructive organisational cultures on organisational innovation. This study focused on the cultural aspect and leaned on Cooke and Lafferty's (1987) organisational culture theory as a base (Cooke & Szumal, 2013). The study sought to add to the existing knowledge on this topic regarding the theoretical need.

In terms of business needs: This study aimed to gain employee perceptions around passive, aggressive, and constructive organisational cultures in the SOEs, determine their impact on organisational innovation and make recommendations for South African SOEs in this regard.

1.5. Outline of the study

Chapter one - the objective of this chapter was to unpack the information regarding the root of the problem, as that is the reason the researcher undertook the study. The study's rationale was discussed in this chapter, as well as its purpose.

Chapter two - the researcher focused on reviewing the insights from the literature and other sources of information to understand what has been found by other researchers and what could be researched to add to the existing findings.

Chapter three - provides the objectives, the theory of the researched literature and the hypotheses regarding the relationship between organisational culture and organisational innovation.

Chapter four - sets out the methodology that the researcher applied to conduct the study in the context of South African SOEs. The strategy used, the approach to gathering data, and the limitation of the methodology were also discussed.

Chapter five - focuses on the collected data results' analysis. The tests were conducted to ensure the data was suitable, valid, and reliable. After that, a regression test was performed to confirm or disconfirm the hypothesis,

Chapter six - the researcher analysed and discussed the details results of the study and the implications it had on the South African SOEs.

Chapter seven - sets out the conclusions and the future recommendations the researcher proposed to the SOEs of South Africa.

Chapter 2: Literature review

2.1. Introduction

The previous chapter focused on the discussions regarding introducing the problem and the purpose of conducting this study. This chapter concentrates on the literature the researcher reviewed on organisational culture and organisational innovation in the business environment. In addition, a review of the two constructs in association with the SOEs sector was also discussed. From the general SOE discussions, it is essential to unfold and link the concepts to the context of SA SOEs as the focus of this study. The literature review follows the roadmap shown in Figure 1.
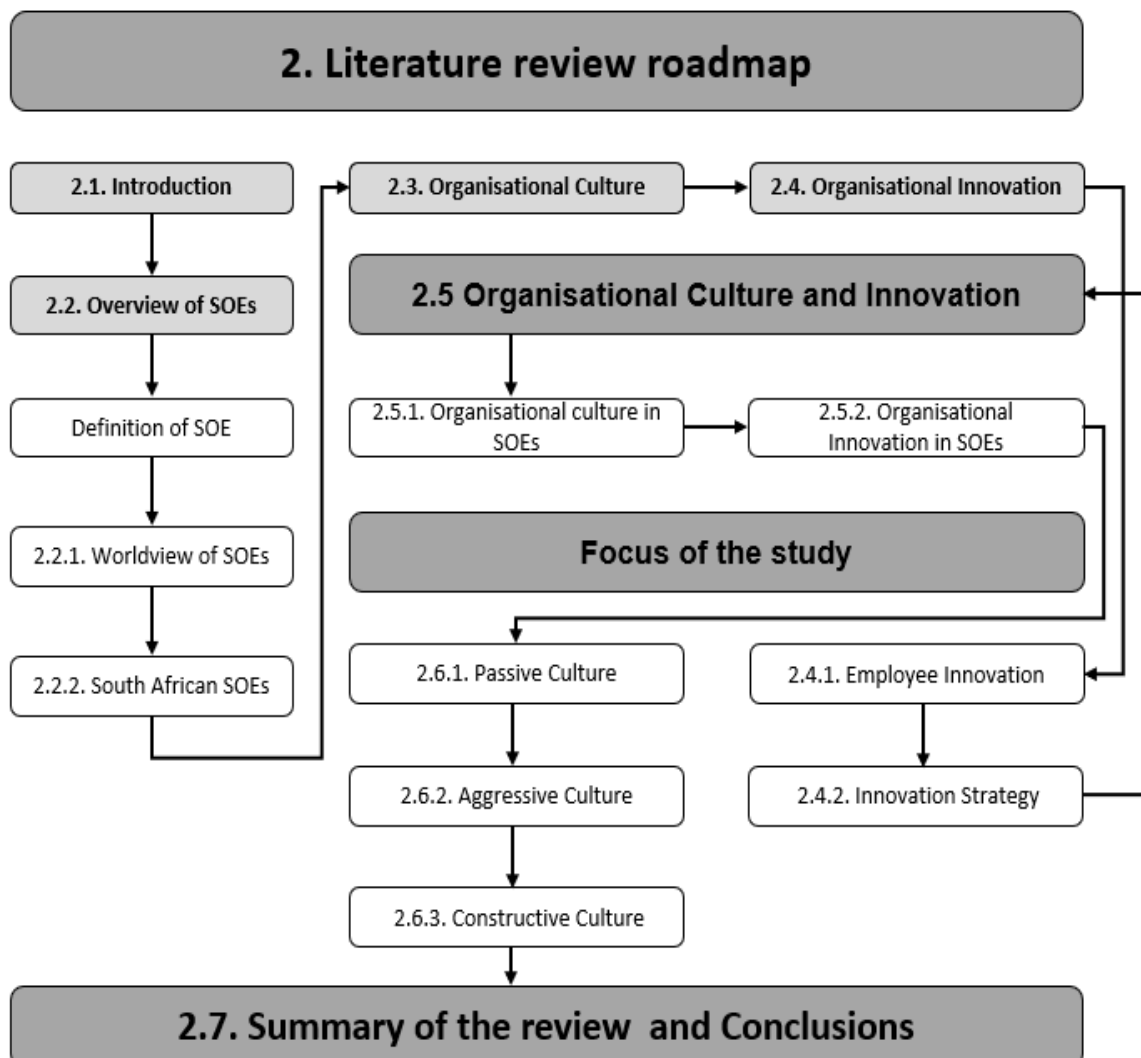
Figure 1: Literature review roadmap

The literature review considers the following concepts and theories:

- Overview of SOEs
- Organisational culture
- Organisational innovation
- Organisational culture and organisational innovation
- SOEs and their existing cultures and innovation
- Theory of organisational culture and assumptions
- Passive, aggressive, constructive organisational cultural styles

2.2. Overview of SOEs

This section emphasises the SOEs' importance in the economy and justifies the researcher's intention to conduct a study in this context. The SOE sector, also known as the public sector, exists among several business sectors in the market, such as the private, banking, and non-financial, some competing and others in complementary positions to trade with SOEs. However, only the private sector is further considered and referred to in the discussions as they thrive through innovation, which is part of the study's focus.

Brock and Reeves (2020) define the private sector, also known as Privately-Owned Enterprises (POEs), as the representation of the national economic portion owned by organisations and individuals. While SOEs are partially or wholly owned by the state, they could be significantly involved in the world economy as they comprise approximately 22% of the world's top corporations, the highest percentage in decades (OECD, 2016). This would be advantageous to the countries with poor-performing SOEs as they could adopt some of the approaches that high-performing SOEs in other countries apply (keeping all things constant), such as China.

In many countries, the state fosters economic activity through policy formation, lobbying, constructing economic infrastructure, and providing incentives. A part of that was achieved through the state's creation of SOEs and the support of POEs to establish a market that promotes economic development. Although POEs' primary objective is to maximise shareholder value and profits, SOEs seek to serve the general public, the public sector, and the POEs by providing public goods and services at affordable prices. While the objective of the two sectors may differ, their role in the economy may be similar. According to Mohammadyoun et al. (2022), the

private sector's role is to produce employment, invest in knowledge transfer and innovation, generate domestic and international wealth, and accelerate economic wealth, which is supported by the role of the SOEs; to accelerate economic growth.

2.2.1. Worldview of SOEs

This section highlights some interesting global statistics about the SOE sector over the past decade. SOEs worldwide have assets amounting to $45trillion, approximately 50% of the global Gross Domestic Product (GDP) (Gaspar et al., n.d.). In Africa, SOEs contribute approximately 15%, while in the Middle East and North Africa (MENA), they contribute more than 50% to the GDP (Iqbal et al., 2019). China was leading the pack, according to Ovens (2013). It had 51000 SOEs, employed 20.2million people, and had a net worth of $29.2trillion when this International Monetary Fund (IMF) report was written. In addition, between 2005 and 2012, nine SOEs, as seen in Table 1, were on the list of the fifteen largest listed companies worldwide (Bruton et al., 2015). This indicates the magnitude of the SOEs sector in the global busines market.

TABLE 1
State-Owned Enterprises Represent 9 of the 15 Largest IPOs from 2005 to 2012

Company	Industry	Year	Value ($ billion)
Agricultural Bank of China (SOE)	Finance	2010	22.1
Industrial and Commercial Bank of China (SOE)	Finance	2006	21.9
AIA (Hong Kong)	Insurance	2010	20.5
Visa (United States)	Finance	2008	19.7
General Motors (United States) (SOE)	Automotive	2010	18.1
Bank of China (SOE)	Finance	2006	11.2
Dai-ichi Life Insurance (Japan)	Insurance	2010	11.1
Rosneft (Russia) (SOE)	Oil and gas	2006	10.7
Glencore International (Switzerland)	Mining	2011	10.0
China Construction Bank (SOE)	Finance	2005	9.2
Electricité de France (SOE)	Utility and energy	2005	9.0
VTB Group (Russia) (SOE)	Finance	2007	8.0
Banco Santander Brasil	Finance	2009	7.5
China State Construction Engineering Corp. (SOE)	Construction	2009	7.3
Iberdrola Renovables (Spain)	Utility and energy	2007	6.6

Source: Adapted from the *Economist*, 2012a, New masters of the universe. Special Report: State Capitalism, January 21, p. 8.

Table 1: Nine SOEs in the list of the Largest initial public offerings (IPO) (Bruton et al., 2015)

2.2.2. South African SOEs

The South African public sector has approximately 500 organisations, including SOEs under the Department of Public Enterprises (DPE)'s oversight, the seven major ones (South African Airways, Transnet, Eskom, SAFCOL, Denel, ALEXKOR, South African Express Airways). Telkom is the only listed one and is under the Department of Communication. Four of the seven central SOEs accounted for 77% of South African employment and 91% of the State assets (Balbuena, 2014).

The SOEs represented the SA revenue stream in 2014, corresponding to 8.7% of the GDP (R381.2billion), equivalent to R33.1billion. Moreover, SOEs accounted for the revenue in these proportions: energy (27.3%), Information, Communication and Technology (ICT) (16.2%), water (3,61%), and financial services (8.0%) (Balbuena, 2014). While they are currently performing poorly and inefficiently, SA SOEs play an essential role in urban development and growth to ensure resilient, inclusive, efficient, and sustainable SA. The major ones, including ICT, power, transport, land ownership and water, are depicted in Figure 2 below.
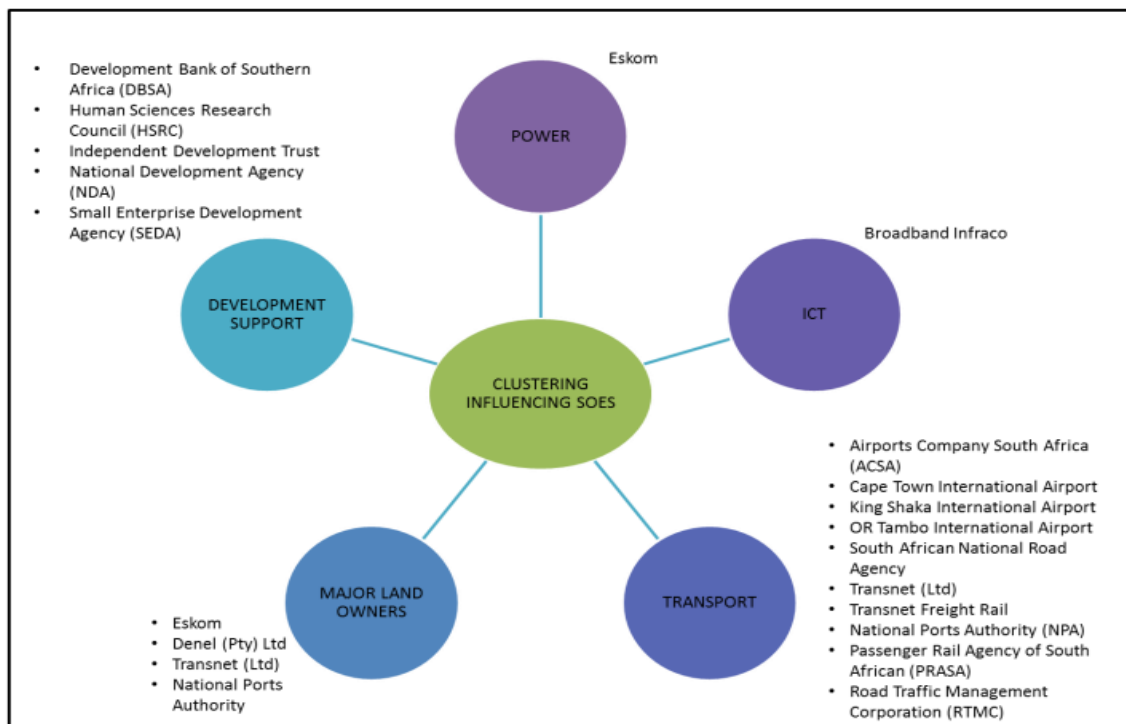
Figure 2: Categories of SA SOEs which influence urban growth and development (Ovens, 2013)

SOEs from around the world have some common characteristics. However, they vary from one country to the next (Rudy et al., 2016). Nevertheless, the role they play in their respective economies is significant, and the following are various reasons governments form and sustain SOEs:

- To provide the government with the tools, it needs to develop a diverse industrial sector and pursue the public's interest through achieving socioeconomic goals (OECD, 2015),

- SOEs are essential stakeholders, promoters and contributors towards urban development and growth (OECD, 2016),

- To play a role in the nation's fiscal policy by assisting the state in taxing customers by trading at monopolistic prices,
- To create an industry with some barriers to limit competition and prohibit POEs from entering,
- To play a role in executing the government's industrial policy and prevent strategic industries' challenges (Rudy et al., 2016).

Szarzec et al. (2021) later added to the above list with the following ways SOEs economically impact the public:

- They provide funding and public goods when the market fails in essential infrastructure projects by producing positive externalities to support governments in achieving an efficient resource allocation,
- They play a role in countering business cycles through investment spending and employment,
- They can limit foreign competitors from dominating specific national industries, such as networks and arms, and
- They alleviate poverty by maintaining employment of the disadvantaged social groups in old and declining industries.

In addition, Minister Lynne Brown confirmed the importance of SOEs in the 2016-17 budget speech; "SOEs are the crucial strategic assets of the state and that it is a need to keep them intact due to their role in ensuring economic growth and employment" (Brown, 2016, p.1). From the brief deliberations above, it can be concluded that SOEs are paramount to the global economy and should be led appropriately, ethically and with dignity to ensure their objectives are adequately realised. Therefore, having discussed SA SOEs and their importance, it is also essential to look at the organisational culture concept, which has significance in their operations.

2.3. Organisational Culture

The word culture is associated with people's lifestyle, an approach a group takes to do things, and past generations pass it to the current and future generations (Cherian et al., 2020). The same can be said about organisational culture, which is defined as the organisation's members' different way of thinking and acting when conducting their duties, solving problems, and making decisions, also known as the glue of the

organisation (Gou et al., 2016; Nguyen et al., 2019). Therefore, it is critical to note that people and culture are key determinants of organisational success or failure, rendering it a leadership responsibility to invest in cultivating a culture that can drive organisations to thrive in their strategies (Hollister et al., 2021).

Literature has many organisational culture models written by various authors, and many researchers have assessed their viability. From that perspective, only a few are discussed in this section. Starting with the widely known Edgar Schein (1985), who emphasised that organisational culture is formed and shaped by the leader's cognitive process. This culture model outlines the three levels of organisational culture as a manifestation of the visible cultural artefacts, beliefs, habits and rules, as well as the prevailing assumptions adopted by and binding members of an organisation together (Schein, 2004; Santoso et al., 2018; Bayhan & Korkmaz, 2021; Armenakis et al., 2011).

Dastmalchian (2000) explained the organisational culture profile by using Quinn and Rohrbaugh's (1983) Competing Values Framework (CVF). From that understanding, the CVF framework enabled other researchers to evaluate organisational culture in relation to other organisational constructs such as ethics, leadership, and effectiveness. To that end, Cameron and Quinn's (2006) model was derived from four value sets a few years later. This model purports that organisational culture comprises four dimensions grouped in pairs which detail the organisational atmosphere according to its collective mindset, and it has been applied widely to assess innovation (Kashan et al., 2021; Naranjo-Valentia et al., 2011; Ramírez et al., 2017; Büschgens, 2013; Liao, 2018).

To delve deeper into Cameron and Quinn (2006) 's model, the first cluster contains clan and adhocracy, which emphasise flexibility; the other is hierarchy and market, emphasising rigidity or stability orientation. The flexibility-oriented cultures promote innovation and encourage creativity due to proactive strategy orientation and lack of formality. On the contrary, the second cluster, "stability-oriented", has rules, regulations, and excessive authority, which leads to poor participation and restricts members' risk-taking capacity regarding innovation (Naranjo-Valentia et al., 2011; Dastmalchian, 2000). Having generally defined the organisational culture and added the two popular models, we then define the model, which is the centre of this study in the following section.

While organisational culture is known as a phenomenon of beliefs and values that leaders create and define for people to mould themselves and fit into when joining the company, Robert A. Cooke believes that organisational culture is how the firm members behave while working towards achieving organisational objectives. It is an approach every employee adopts, despite their various interests and background cultures, to survive in an organisation. It comprises the following three main culture types; passive, aggressive and constructive cultures, discussed in detail later in this chapter (Bolcas &: Ionescu, 2019).

2.4. Organisational innovation

Innovation is known for its enabling power to accelerate economic growth. It was defined by Schumpeter (1934, p.931) as "the creation and the first production of a process, an introduction of a product, service, method, or system." In addition, it is said to be a new combination of existing or new knowledge, equipment, resources, and other factors used to create new values (Quintana et al., 2011). Moreover, the new changes and explorative activities in production processes, products, materials, resources, markets, and organisational models have also been considered innovations (Chen et al., 2018; Edward-Schachter, 2018). Innovation is further associated with creating new knowledge, breaking away from stereotypes, experimentation, flexibility, risk-taking and accepting that failure is possible (Gieske et al., 2020).

Tian et al. (2018, p.3) identified two innovation processes: first, transforming new ideas into better processes, products, and services. The second one uses new things such as "organisational structures, programs, plans, technology and administrative systems" to improve organisational growth and performance for success and sustainability.

2.4.1. Employee Innovation

The above definitions provide a comprehensive view of understanding innovation. The following section breaks down the concept of innovation into employee innovation and innovation strategy, which are the focus of this study.

Innovation originates from cognitive efforts, which led to Janssen (2003) and Iqbal et al. (2019) basing the innovation explanation on the notion that creative ideas are a foundation of innovation. This is because it starts from an individual's ideation, who

then continues to plan, develop, modify, discuss, and eventually execute those ideas. Therefore, (Nguyen et al., 2019, p.726) later defined employee innovation as the creativity of the employee, and to be precise, as "a complex integration of generating, promoting, and realising ideas including problem identification, solution implementation, and product, process or service development."

2.4.2. Innovation Strategy

An innovation strategy is a process organisation use when creating new products and technology to respond to market changes (Chen et al., 2018; Iqbal et al., 2019). It consists of dimensions that describe the degree of innovation execution, R&D expense, and business systems embedded in management values, products, and processes (Sethibe & Steyn, 2016). The first of the two innovation strategies is the exploratory innovation strategy, characterised by experimentation, discovery, research, innovation, and risk-taking behaviours. It emphasises creating new markets, developing new distribution channels, and offering unique designs to satisfy the varying demands of emerging markets. Secondly, the exploitation innovation strategy includes production process selection, efficiency, modification, and implementation. It enables firms to improve existing designs, broaden existing skills and knowledge, enhance the productivity of existing distribution channels, and expand product lines (Chen et al., 2018).

This paper focuses on organisational innovation, a key element of competitive advantage, success, economic growth, firm growth, and resilience (Haar, 2018; Kashan et al., 2021). Therefore, enhancing the organisational need to develop innovation capabilities and practising agility, adaptability, future thinking, and reinvention is critical for company sustainability (Saunila & Ukko, 2012). Although multiple authors offered different concepts to define organisational innovation, they still lack consensus, according to Shafi et al. (2020). Therefore, the researcher adopts employee innovation and innovation strategy as dimensions suitable for the study.

2.5. Organisational Culture and Organisational innovation

Having defined and discussed organisational culture and innovation in the earlier sections, it is necessary to determine how literature links the two constructs.

Three functions of a solid organisational culture are that it is the social glue that retains the top performers and attracts others to the firm; secondly, it influences and controls the staff's behaviour and decision-making; thirdly, it helps individuals communicate their ideas and understand firm's events, basically to make sense of the whole operational process as they share the same mindset of realities (McShane & Von Glinow, 2010; Akpa et al., 2021). Therefore, depending on how the norms, beliefs and values influence how individuals in a group think and behave, they could either promote or hinder innovation and creativity (Martins & Terblanche, 2003)

Moreover, organisational culture may be perceived as a competitive advantage due to its uniqueness from company to company. It describes unparalleled processes, such as innovation, due to the constant nurturing of collaboration, sensemaking, and perspective-taking (Murphy et al., 2013; Ramadista & Kismono, 2020). Therefore, considering that uniqueness, Nguyen et al. (2019) then grouped the antecedents to employee innovation into two: organisational elements such as leadership, organisational climate, and incentives, with another group being individual elements which include mood, connectivity, and personality to be the parts of culture that separates an organisation from the rest.

As culture plays a role in the business process and determines sustainable innovation, firms require a culture suitable for continuous innovation (Bayhan & Korkmaz, 2021). Thus, leaders should build and maintain an influential corporate culture by managing resource allocation, emphasising ethical practice, trustworthiness, and leadership credibility (Muafi et al., 2018; Sethibe & Steyn, 2016). This culture should foster and promote innovation, prioritise upskilling employees, remove hindrances, and incentivise them accordingly (Chen et al., 2018). A year later, Shayah and Zehou (2019) added that this culture should emphasise employee empowerment, responsibility, flexibility, and self-leadership. Thus, organisations should be keen to transform their cultural characteristics to support and absorb innovation. The following section provides some perspective on how organisations can achieve transformation.

Culture is the organisation's mindset; the organisation is the members it hires as they are responsible for the firm's success (Sahoo & Sahoo, 2018), employees are the centre of innovation, and the reward system of a business is part of the cultural artefacts. Employees are rewarded for their services; however, when they give more, they expect more in return. Therefore, if they, at any point, perceive unfairness and

their innovative investments are under-appreciated and inadequately rewarded, they may experience stress, and the opposite is likely to be true. This lack of organisational reciprocity is met by the innovator's psychological reaction manifesting as anxiety and tension resulting in stress (Janssen, 2003). Moreover, if prolonged, the effects would be dire for the individual and the organisation; therefore, leaders should be cognisant of how culture affects innovators.

In addition, culture should support effective and efficient communication throughout the organisation. According to Shayah and Zehou (2019), the free flow of information, curiosity, and the eagerness to learn more allow creative thinking, which results in the formulation of improved products and leads to the enhanced overall performance of the organisation. Furthermore, behaviours that support open communication and creativity, strategy, structure, and support mechanisms are the determinants of an innovation-conducive culture (Shayah & Zehou, 2019; Kitsios & Kamariotou, 2016). Therefore, SOEs should create an environment with effective and inclusive communication and decision-making processes and amicable conflict management (Sahoo & Sahoo, 2018). Such an environment is essential for organisations seeking an innovative culture.

2.5.1. Organisational cultures in SA SOEs

As organisational culture is the glue that binds firm members together, it is made up of tangible and intangible characteristics. Every firm has a unique culture that it could discuss, disclose or promote to the public in either all or one of the following public channels: i) A hard or soft copy of the firm's corporate employee handbook, ii) The organisation's integrated annual report, iii) The organisation's official corporate website's homepage, iv) Specialised monographs, and v) Mass media reports found through search engines such as Bing, Baidu and Google (Gou et al., 2016)

Having observed the values SA SOEs own as part of their culture, Lekgothoane et al. (2020) found that culture in South African SOEs consists of two sets of factors. The individual factors include job satisfaction and organisational citizenship behaviour. The other set is organisational factors, such as recruitment and selection, which predict a hostile culture permeated by politics. In addition, Rabilall (2017), in the Companies and Intellectual Property Commission (CIPC) publication, mentioned that SOEs lack agility due to political interference in their board decisions regardless of their market domination and state mechanisms. Furthermore, due to no threats regarding retrenchment at the SOEs and a bureaucratic perception of unethical

leaders, employees tend to lose their sharpness and zeal to ideate. They stick to the service level agreement when performing duties and do not go the extra mile (Rabilall, 2017; Lekgothoane et al., 2020).

Bhatta (2018, p.45) stated that the inability to promote innovation stems from employee attitude, SOEs' organisational culture, and the perception that employees with some power do not need to enhance their knowledge and skills. Lastly, "SOEs have a control and command-based hierarchical structure which creates a stressful working environment and demotivates employees." So, from Bhatta's (2018) observations, that SEO culture can be associated with a hostile culture where superiors use performance appraisals as a punishment instead of a development mechanism, career development opportunities are limited, and there is, to some extent, maltreatment from management to employees and horizontally where employees mistreat counterparts (Lekgothoane et al., 2020). In contrast, Lekgothoane et al. (2020) found that SOEs with a culture of cohesiveness and respect were likely to achieve their objectives as workers were motivated and gave more than expected, as opposed to when SOEs have a hostile culture.

Organisational culture is an intangible yet critical component, distinct from firm to firm. Therefore, for organisations to dedicate themselves significantly to goal attainment, they should have a robust set of values to aid that implementation. While the culture is invisible, it could be identified by observing the company's atmosphere, paying attention to its members' behaviour, reward system, management support, communication patterns, control, tolerance, and how other stakeholders perceive it. In addition, Guo et al. (2016) suggested the following channels one can peruse to examine a particular firm's organisational culture:

- The company's integrated annual report,
- The official corporate website of the corporation,
- Dedicated monographs,
- Press releases as they are identified using search engines such as Baidu, Google, and Yahoo,
- The company's employee handbook is available in hardcopy or on its website.

From one of the suggested channels above, it was found that the organisational culture at Eskom Holdings Limited is of lethargic and apathetic behaviour and is

characterised by corruption, which has been a significant threat to this culture, as uttered by its CEO, Andre De Ruyter. In the same breath, he added that he is shaking the company out of this culture because should the status quo remain, South Africa would remain with the unending load-shedding challenge. He further admitted that the culture could not transform overnight; however, he is actively transforming the culture by implementing measures to address the challenge, as he has already suspended two PowerStation managers for apathetic behaviour (Stoddard, 2020). Despite the stigma attached to the SOE's lack of efficiency through constant load shedding, its cultural values, as seen in Appendix 1, are Sinobuntu (caring for one another), customer satisfaction, excellence, zero harm, integrity and innovation (Department of Public Enterprises [DPE], n.d.)

In addition, values are part of the culture, and some of the SOE's values are seen in Appendix 1. These shared values are added to the artefacts and other underlying assumptions to form a glue that sticks the organisational members together. SA SOEs commonly care for customers' needs, which is essential for revenue. They ensure employees are high performing and cared for. Furthermore, innovation was an overall value identified in most of them. These values are appealing on paper and indicate the intentions of how they have been executing their respective strategies (Department of Public Enterprises [DPE], n.d.; Telkom, 2016; Development Bank of Southern Africa [DBSA], 2021). However, in reality, the innovation value is questionable as discussed as part of the SOEs inefficiencies in Chapter 1.

While other SOE's values are listed and explained, Transnet's culture charter addresses the values, creates more meaning, and can be enacted. As opposed to when a culture is enacted out of psychological contracts, this is put in a manner that the organisation promises the customers delivery and employees respect, dignity, and good rewards (Transnet Freight Rail, 2013). This is a manner which brings culture to reality and provides the stakeholders with a clear cultural perspective as opposed to unwritten agreements regarding the existing culture. This section's objective was to overview the cultural values the mentioned SOEs shared briefly. The following discusses innovation as administered and managed in the SOEs.

2.5.2. Organisational innovation in SOEs

Innovation is considered the crucial determinant of sustainable global economic growth, and it is one of the core competencies of successful firms and a fundamental element sustaining communities and individuals in this challenging and complex environment (Castelnovo, 2022; Sethibe & Steyn, 2016; Armenakis et al., 2011; Chen et al., 2012). Its role in SOEs interacts with all value chain activities, making it a network and not a single function that enhances the competitive advantage as new products and services are developed. Therefore, through SOEs, the government improves its economic development and the various industries' innovative capacity through innovation policies (Hu & Matthews, 2005; Li et al., 2007).

However, because their offerings have a broad spectrum of consumers and are diverse, it becomes cumbersome to have a clear innovation definition, targets, and objectives, and it is inadequate to use profits to define targets (Bhatta, 2018).

In the SOEs of many developing countries, innovation constitutes the creation and execution of new ideas for the benefit of the public. SOEs are agents of knowledge exploration, and this notion emanates from the SOEs' ability to explore the unexplored territory (Benassi & Landoni, 2019). They frequently expand their existing value chains, gain technical competencies, seek, and exploit novel technologies, and apply innovation in their processes, systems, and products.

Additionally, SOEs have a unique power to link seemingly unconnected and conflicting knowledge management systems in an innovative approach to establishing new organisational configurations (Benassi & Landoni, 2019). For instance, one of the initial events that SOEs recognised as the action and results of innovation was acquiring various operating equipment through the transfer of technology from their developing country partners (Bhatta, 2018). With that said, some SOEs have transformed from that initial technological event to significantly improved strategic implementation by digitising all aspects of their business. Moreover, they have substantially improved in delivering value to consumers and other stakeholders (Umgeni Water Annual Report, 2022).

Innovation in SOEs has been generally perceived to be less efficient regarding allocating resources than in its POE competitors (Belloc, 2014; Benassi & Ladoni, 2019). However, in SOE's defence, Castelnovo (2022) found in some countries, including Italy, France, Germany and Sweden, that some SOE industries have an

average innovation output that is superior to those of POEs, such as transport, gas, and electricity. On the other hand, the SOE industries with innovation output inferior to that of POEs are the scientific, professional, and technical activities. A clear depiction of the output comparison of SOEs to POEs in 2015 and 2017 can be seen in Appendix 2.

SOEs are less efficient than POEs, as discovered by Bhatta (2018) because SOEs leaders lean towards overworking employees with routine daily activities, leaving them no room to think creatively. Moreover, innovative thinking is hampered due to the lack of a free flow of information, resulting from competition among divisions and confidentiality. The Corporate Finance Institute (CFI) team (2022) substantiated that observation by pointing out that the problem lies not only in government control but also in the lack of managerial skills and the extent of leadership autonomy. This indicates that the SOE leadership could hamper organisational innovation.

Organisations should be able to measure innovation and have targets to keep a track record of the innovation quality and performance. The literature offers insights into registered patents, new designs, products or technology development, and R&D expenditure to measure innovation (Castelnovo, 2022; Tian et al., 2018). Although the magnitude of R&D expenditure does not necessarily equate to firm's innovativeness, R&D activities remain a vital part of measuring organisational innovation. This is evident in companies that remain competitive, agile, and relevant due to consistent investment in R&D (Tian et al., 2018).

Regarding measuring innovation, Bortolotti et al. (2018) found that the number of patents representing the quantity of innovation decreases by approximately ten percent and that the quality of innovation is affected due to government ownership in the European SOEs. According to Zhang and Chen (2020), SOEs are risk-averse; therefore, they spend less on R&D to mitigate the risk of potential failure of innovation projects that may take a lengthy period to realise their intended returns. However, Belloc (2014) asserts that SOEs are at an advantage as they could invest more in innovation because the state can raise additional taxes to inject funds into the R&D pool to counter unfortunate cases of failure. However, on the contrary, SOEs' R&D investment should be less than POEs' investment as they are less likely to compete in the market (Zhang & Chen, 2020).

SOEs spend less on R&D because of the following three reasons: 1) governments strive to achieve their political objective by intervening heavily in the operations of the SOEs, therefore, leading to short-term decision-making and neglecting more riskier and potentially profitable innovative long-term projects, 2) lack of proper incentives and supervision mechanisms for management causing significant agency problems, 3) barriers to entry for competitive private companies through licenses created by administrative monopolies (Zhang & Chen, 2020). These three reasons, among others, result in reduced productivity and innovation in the SOEs.

2.6. Theory of organisational culture and assumptions
Cooke's organisational culture model

According to Cooke and Lafferty (1987), organisational culture is how employees with various backgrounds behave to ensure a stable future and growth and accomplish a specific goal (Bolcas & Ionescu, 2019). Cooke and Szumal (2013) and Krauss and Vanhove (2022) list the twelve groups of behavioural norms related to the three types of organisational culture, namely, aggressive, constructive, and passive. The discussion below provides deeper insights into the three types of organisational cultures as per Robert A. Cooke (Cooke & Szumal, 2013):

2.6.1. Passive culture
In organisations with a passive culture, employees' only way to be considered productive is to follow superiors' exact instructions and not, in any way, deviate from the rules and procedures (Bolcas & Ionescu, 2019). Consequently, they become dissatisfied and less motivated to think innovatively as they are pressured to think and act differently from how they would to remain effective. Employees evade conflict by not expressing a different opinion. Moreover, most importantly, rules and procedures surpass personal beliefs, ideas, and judgment (Leith, 2016).

2.6.2. Aggressive culture
Highly competitive employees characterise aggressive organisational culture. They compete within a team, working towards a common goal (Bolcas & Ionescu, 2019). They believe that information possession is a source of power and that one is incompetent for not being well informed. It is characterised by focusing on tasks than the employees. In this culture, people overlook organisational success to concentrate on substitution for individual success (Leith, 2016). This culture is highly stressful,

and decision-making is not inclusive, based on rank instead of expertise (Leith, 2016).

2.6.3. Constructive culture

In organisations with a constructive culture, employees value the freedom of expressing feelings and ideas, which hastens information flow because they believe that effective and efficient communication expedites problem-solving. Decision-making becomes effortless when everyone is included (Bolcas & Ionescu, 2019). Employees here believe that goal attainment and achieving the best results is much simpler when information is shared freely. Because communication permeates the organisation, employees are encouraged to present their full potential and pursue high performance. In this culture, there is a desire to learn and gain experience with a balanced concern for tasks and people. Companies with this culture produce high-quality outputs, and employees are delighted and self-motivated (Leith, 2016). These cultural styles are discussed further in Chapter 3.

2.7. Summary of literature review

SOEs worldwide are critical for economic growth. The government formed them to address some socio-economic issues, and their poor performance should not overshadow their importance.

The complexity of South African history makes it challenging to privatise the SOEs. Their primary role is to ensure that public goods and services are equally shared amongst all citizens at affordable rates. On the other hand, POEs' primary objective is profit maximisation; therefore, privatising the SOEs would be detrimental to previously and currently disadvantaged citizens. Therefore, for the benefit of all, it is essential to continue to seek ways to improve them and reposition them to an excellent status to deliver on their primary objectives effectively and efficiently.

Organisational innovation fuels firm growth and ensure sustainability when administered and managed well. It is one of the constructs reviewed in the literature to investigate and assess how it is applied in the SA SOEs and whether it is affected by the culture in those organisations.

To some extent, organisational culture, affects organisational innovation, as the literature suggested. The Cooke model suggests that organisational culture is how people behave while implementing strategies towards goal attainment, and three styles are briefly discussed. After that, the study probes further into this to better

understand the impacts of the three organisational culture styles: passive, aggressive, and constructive, on organisational innovation. Thus, seeking ways to improve performance and productivity in the South African SOEs.

Chapter 3: Research objective and hypotheses

3.3. Introduction

The discussion below provides deeper insights into the three types of organisational culture, as per Cooke (Cooke & Szumal, 2013) and how they affect organisational innovation. Culture's role in innovation performance, contribution and relevance has been internationally recognised as a crucial element in organisational and economic development. From that perspective, the researcher studied the SA SOEs' environment to keep up to date with the international landscape regarding factors that enhance organisational approaches towards goal achievement. After this, the hypotheses for this study were framed.

Literature has proven that organisational culture impacts various innovation dimensions (Chen et al., 2018; Lei et al., 2019; Murphy et al., 2013; Paroline et al., 2020). However, it is critical to evaluate the nature of this relationship based on the theoretical dimensions of this study. The first hypothesis, which represented the main question of the study was to test:

- H_1: Organisational culture has a significant impact on organisational innovation

3.2. Passive Culture

A passive organisational culture is characterised by norms that tacitly need members to interrelate such that their security in a company is guaranteed (Krauss & Vanhove, 2022). Hence, employees aim to safeguard their employment positions by ensuring they do as their bosses instruct to satisfy them (Leith, 2016) and strictly adhering to the imposed processes, rules, and procedures (Bolcas & Ionescu, 2019), which at times stifle open-mindedness and freedom to use their cognitive abilities. Therefore, they act contrary to their beliefs, leading to their stagnation and limited creativity. However, a company that values innovation will motivate and encourage its members to take risks and be courageous, as it has the potential to foster creative thinking and improves employee independence. In contrast, organisations which disregard innovation tend to have practices and strict guidelines that employees must always abide by without questioning (Wedgewood, 2021).

While this culture style oppresses the employees' voice, Shin et al.'s (2022) findings demonstrate that the employee's voice fast-tracks information sharing. It is a positive predictor of organisational innovation and implies that firms should establish cultural norms that encourage employees to use their voices.

The characteristics of a passive culture are (Cooke, 2022):

- Approval: Employees cannot decide on any execution independently without the superior's consent to implement.
- Dependent: Due to employees blindly following their superiors' instructions, their performance depends on what the manager decides.
- Conventional: Employees are not at liberty to think outside the procedures and policies stipulated by the organisation.
- Avoidance: This norm is characterised by members who follow policies and procedures and overlook or avoid their satisfaction and interests.

Thus, the study tests the following hypotheses:

- H_{2a}: Passive organisational culture has no significant impact on organisational innovation
- H_{2b}: Passive organisational culture has a significant impact on organisational innovation

3.2. Aggressive Culture

The norms characterising aggressive organisational culture encourage members to approach activities forcefully to protect their status and security (Cooke & Szumal, 2013). In an aggressive organisational culture, competition and perfection motivate the employees. They strive to be influential by knowing more than others, discouraging knowledge sharing. Furthermore, employees are perceived as incompetent for seeking assistance from counterparts or managers (Bolcas & Ionescu, 2019; Krauss & Vanhove, 2022). Members contest for attention and appreciation. Nguyen et al. (2019) demonstrated that employee wellness and happiness stimulate innovation and productivity. However, in this culture, the opposite is perceived.

Aggressive culture has the following key features (Cooke, 2022):

- Opposition: Employees in this culture criticise and oppose one another's ideas and are perceived as incompetent for seeking assistance from counterparts or seniors.
- Competitive: This culture discourages teamwork as employees strive to outperform their counterparts.
- Power: They strive to be influential through knowing more than others, discouraging knowledge sharing.
- Perfectionist: Employees are motivated by perfection as it makes them appear competent.

Thus, the study assesses the following hypotheses:

- H_{3a}: Aggressive organisational culture has no significant impact on organisational innovation
- H_{3b}: Aggressive organisational culture has a significant impact on organisational innovation

3.3. Constructive Culture

Constructive organisational cultural norms encourage members to meet their higher-order satisfaction needs through interaction among themselves and tasks. An organisation with a productive culture is characterised by employees having the liberty to share information, ideas, and solutions (Krauss & Vanhove, 2022; Cooke & Szumal, 2013; Cooke, 2022).

In this culture, workers communicate appropriately for the organisation's overall benefit (Bolcas & Ionescu, 2019) and approach tasks to satisfy their higher-order needs. From that, it can be said that innovation is encouraged when the environment is constructive and tolerant of failure. Furthermore, organisations with constructive cultures encourage goal achievement, teamwork, effectiveness, and flexibility (Krauss & Vanhove, 2022). Therefore, it might imply that disputes emerge when members feel unheard, and their ideas and decisions are disregarded without sound reason, leading to demotivation.

A constructive culture consists of the following key features (Cooke, 2022):

- Achievement: achievement of set objectives within the desired time frame characterises this cultural norm,

- Affiliative: Positive workspace ambience and avoidance of disputes and conflicts are elements of this norm,
- Encouragement: employees are encouraged to act at their best level to deliver outcomes, and they strive to improve the company's image,
- Self-Actualizing: Employees remain motivated and fully realise their potential.

Thus, the study considers the following hypotheses

- H4a: Constructive organisational culture has no significant impact on organisational innovation.
- H4b: Constructive organisational culture significantly impacts organisational innovation.

Figure 3 indicates the hypothesis structure of this study.
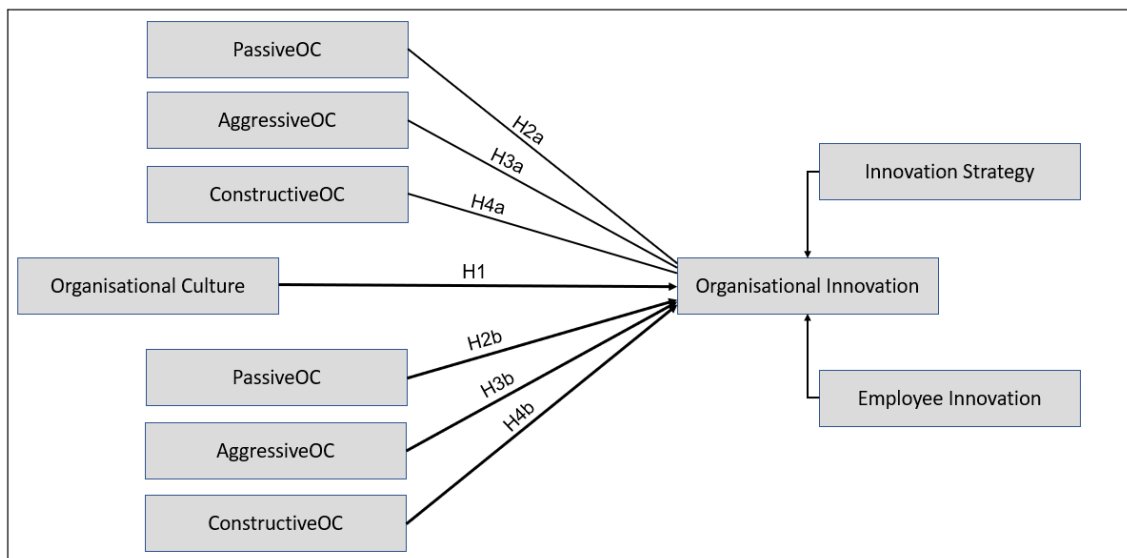
Figure 3: Hypotheses model of the study

3.4 Conclusion

While this study is focused on South African SOEs, the findings may be relevant to organisations with similar experiences and contexts.

Chapter 4: Research Methodology

4.1 Introduction

The research focused on understanding how organisational culture affects organisational innovation in South African State-Owned Entities (SA SOEs). It further focused on the effects of the three dimensions of organisational culture theory of being passive, constructive, and aggressive on organisational innovation, emphasising innovation strategy and employee innovation.

A wealth of research has been performed on the constructs of this studied (Büschgens et al., 2013). The study sought to obtain data from a large sample and determine a relationship between the constructs. To that end, a quantitative methodology is defined by Saunders and Lewis (2018) as analysing data from large samples numerically through consistent and reliable methods to predict and find relationships, averages, and patterns. Therefore, this methodology was suitable for this research.

The study took an exploratory approach due to its complex nature and the objective to discover and gain advanced knowledge and determine the relationship between independent and dependent constructs that have been minimally researched. Thus, the research aimed to complement the existing knowledge on the topic by generating new insights in the SA context (Saunders & Lewis, 2018; Leavy, 2017).

4.2 Research Design

Positivists believe that knowledge is not absolute but relative, and positivism approaches the study of society systematically and scientifically; furthermore, it promises detailed and accurate knowledge using methods to yield information that is not influenced by the biases and interpretations of humans (Saunders & Lewis, 2018; Rahman, 2017; Kankam, 2019). Therefore, positivism was applied to discover and collect quantitative data that is meaningful and credible as it is scientific, objective, and does not depend on how the researcher interprets the events.

This method follows a drop-down approach that starts with collecting data and ends with updating existing ideas in the literature (Saunders & Lewis,2018). The Cooke model of three organisational cultures was used as a base theory for this research and its effects on organisational innovation. The study intended to update and add

to existing ideas, as it aimed to test for the effects that organisational cultural styles have on innovation; it thus took a deductive approach which suited the quantitative methodology; in essence, data was collected to be tested in order to approve or disapprove an existing theory (Rahman, 2017; Saunders & Lewis, 2018).

To confirm or disconfirm the research hypotheses, the research followed a structured data collection from a sizable population as a research strategy (Saunders & Lewis, 2018). The researched constructs were measured through various variables phrased as questions and populated on a questionnaire and did not require the researcher to be present when participating in the test. Therefore, for the survey strategy, the mono-method quantitative study was the methodological choice the researcher applied, where questionnaires were responded to via electronic channels for data collection (Mohsen et al., 2020). This was an appropriate method, as measuring instruments were sourced from existing literature (Cooke & Szumal, 2013; Scott & Bruce, 1994).

Therefore, the quantitative methodology was applied based on the above-related definitions and the needs of the study.

A cross-sectional research design means the researcher collects data once in a period (Rahman, 2017). This research took place over a short period and tested the relationship between academic constructs. This study did not attempt to examine the patterns of the variables or to note changes in variables over a long period where a longitudinal study would have been appropriate. This study tested the relationship between constructs in the cross-sectional data collection as it was collected only once using a questionnaire (Ramírez et al., 2017).

4.3. Population

The research was conducted in the SA SOEs, and the employees from those organisations were considered the research population. However, because the study was not based on the entire population but only on the study's objective, demographic information such as tenure, gender, position in the organisation, and age ensured that the survey was distributed to the appropriate people to ensure population representation (Nguyen et al., 2019). The respondents or sampling frame included the junior professionals, supervisory, management and executive levels, as these employees implement the strategy daily to achieve a common goal. Therefore,

they were suitable for the study as they are directly affected by their firms' organisational culture and innovation. Decision-makers such as managers were included to assess how they fit into the constructs of this study. Three hundred surveys were sent to possible respondents within the four selected employment levels.

The employees from the SA SOEs were the unit of analysis in the study as they are closely experiencing the effects of the organisational culture on organisational innovation. These individuals represented the population and 170 participated by thoroughly responding to the questionnaire with valid and reliable information suitable for analysis.

4.4. Sampling method and sample size

A required number of responses was achieved to ensure the data was reliable and valid. Moreover, to make statistical inferences, quantitative research preferably involves probability sampling. Probability sampling becomes relevant as it refers to selecting a sample from a population based on the principle of randomisation, which is random or chance selection (Saunders & Lewis, 2018). For this study, the sampling selection consisted of six strata: junior professionals, supervisors, junior, middle, senior, and executive management.

For stratified sampling, the researcher requested the list of the population under study from the organisations. Participants employed in all the studied positions were randomly selected from the list to represent the entire population (Saunders & Lewis, 2018; Scaliza et al., 2022). The researcher distributed the questionnaire to the 300 randomly selected participants from the six strata. While 80 – 100 responses were anticipated, 170 complete and valid questionnaires were received and analysed for findings.

4.5. Measurement instruments

The researcher used items developed from previous studies to ensure validity and reliability in measuring the variables. Constructs were measured in the form of an online questionnaire. This study measured organisational culture using Cooke's organisational culture behavioural norms (Cooke & Lafferty, 1987) as guidance. Minimal literature was found on these organisational culture norms; they have not

been studied much in South Africa and other developing countries in a similar study context. However, their reliability and validity on the 120 items have been proven in Cooke, Lafferty, and Szumal's literature cited by Badia et al. (2020). This study used the summarised version of 12 item scale to assess the norms relevant to the three culture types (Krauss & Vanhove, 2022; Murphy et al., 2013), and the questions were refined to fit the specifics of the study. This organisational culture questionnaire can be seen in Appendix 3.

To measure organisational innovation, the researcher used the ten items of innovation strategy adopted from Morgan and Berthon (2008), cited in Chen et al. (2018), as guidance. This instrument measures five exploratory items and five exploitative items of the innovation strategies (Morgan & Berthon, 2008). The researcher used the 22-item questionnaire extracted from Scott and Bruce (1994) to assess employee innovation. However, since the two questions were similar, one was removed, and only twenty-one items were used to measure the sub-construct. The researcher modified the proposed measuring instruments to fit the purpose of this study (Nguyen et al., 2018). A five-point Likert-type scale was used to measure the constructs and the variables, and it had a range from one = strongly disagree to five = strongly agree (Murphy et al., 2013).

4.6. Data gathering process

4.6.1. Pre-Test
After acquiring authorisation, an ethical clearance form was completed and approved for data gathering, as seen in Appendix 4. A questionnaire was created on Google forms, and before sending it to the sample, it was sent to ten volunteers for the pre-test. Volunteers provided the following feedback:

- The controlling question, which validated that an SOE employed the respondent, did not end the survey,
- The progress bar was not set,
- The survey was not limited to one response,
- The last set of questions was a multiple-choice question with two options (strongly disagree and strongly agree); instead of a linear scale from 1: strongly disagree to 5: strongly agree, and

- Questions 7, and 21, as seen in Figure 1, were "unclear and confusing."

Google forms application was amended to incorporate the changes suggested by the pre-test volunteers. The questions were rephrased for ease of understanding, which can be seen in the final questionnaire in Figure 1 below, indicating a list of the initial and new questions.

RESEARCH QUESTIONNAIRE			
		Initial question	New question
Question		Organisational culture	
7	Competitive norms	I am expected to operate in a "win-lose" framework, outperform others, and work against (rather than with) my peers.	I am encouraged to outperform others, and compete, rather than collaborate with my peers.
		Eplorative Innovation Strategy	
21	Explore 3	Product innovation is 'offensive' (as opposed to 'defensive').	Our products and/ or services have unique features that are not available in competitors' offerings.

Figure 4: List of refined questions

4.6.2. Data Collection

Data collection began after the approval of the ethical clearance. Following the pre-test completion and amendments to the electronic questionnaire to incorporate pre-tests' participants' feedback, It was sent to participants via email and applications such as WhatsApp, Telegram and LinkedIn. All clauses: the time required to complete, voluntary participation, freedom to quit participation without any fines and anonymity of the organisation and the participants were clearly stated at the beginning of the questionnaire.

There were 205 responses received. However, 23 responses were from participants not employed by the SA SOEs, 10 were pre-tests responses, and two damaged responses were removed to reach a sample of 170 qualifying data. Data collected was stored in a hard drive, and a password was set to lock the data in to ensure safekeeping for a minimum of ten years.

4.6.3. Coding of the data

Data was downloaded from Google Forms onto an excel workbook and coded before importing to SPSS. Demographics were coded into numerical values using pivot tables. The research questions were abbreviated into variables suitable for the SPSS analysis, as seen in Appendix 5.

4.7. Analysis approach

Before the data analysis, the researcher scrutinised the data and removed the incomplete and invalid ones, testing the sampling characteristic for biases. The researcher set a controlling question asking if the respondent works for an SOE; if the answer were "NO", the survey proceeded to the submission button. Therefore, those responses were removed prior to the analysis. A cleaned Comma Separated Values (CSV) file was imported to SPSS. This study focused on a model that utilises latent factors and observed a string of variables. SPSS was a suitable tool to analyse the data, considering the sample size of 170.

The above step was followed by assessing the structural and measurement models, and then the researcher conducted vigorous checks such as validity, reliability, and factor analysis before testing the hypotheses (Scaliza et al., 2022).

4.8. Testing the hypotheses

Linear regression on SPSS was used to test if the constructs were significantly related or unrelated. The strengths and direction of the relationship were tested (Wegner, 2020). The researcher could have used a simple linear regression that finds a straight-line equation representing a relationship between one dependent and one independent. However, the aim was also to test the direction and strength of the relationship. Standardised residuals of the dependent variable's was also tested for outliers, and assumptions of normality, multi-collinearity, independence, and homoscedasticity. Therefore, a multiple regression was conducted to analyse the relationship's significance, weights, and slopes and determine whether organisational culture predicts organisational innovation.

4.9. Quality controls

For this research, a pre-test was conducted during the data collection phase to ensure the online questionnaire is clear, understandable and works appropriately. Descriptive statistics were calculated on SPSS to find the means, skewness and standard deviations and data was assessed for outliers and biases. To assess the model for the validity of indicators used to measure constructs, SPSS was used to calculate the variable correlations for validity to ensure each indicator measurements meet their expectations (Scaliza et al., 2022: Hair et al., 2019). Moreover, a Pearson

correlation was used to analyse the relationship among the variables and evaluate the questionnaire's ability to measure the constructs (Daud et al., 2018; Hair et al., 2019).

Cronbach's Alphas were computed for the observed indicator variables to ensure that a reliable and consistent instrument was developed, and the reliability of the construct was tested using Cronbach's Alpha with threshold values of >/= 0.7, as it is considered acceptable for internal consistency (Hair et al., 2019). In cases where Alphas were lower than the threshold, some construct indicators were removed to strengthen the construct reliability.

Exploratory Factor Analysis was conducted to create composite values representing sets of variables by reducing the variable combinations that capture the multicollinearity of several variables (Hair et al., 2018). EFA was chosen instead of Confirmatory Factor Analysis (CFA) as the sample size was not suitable for the latter (Randall & Jung, 2018). Moreover, for the appropriateness of conducting an EFA, it was required to assess Kaiser Meyer Olkin (KMO), of which values of > 0.5 were achieved for all the constructs, and Bartlett's tests' significance level of $p < 0.05$ were determined for all the constructs.

Ethical considerations were essential to ensure that individuals participate willingly and honestly and that the research is conducted with consent (Rahman, 2017). The researcher completed an ethical clearance form, which was approved, and consent was also provided in the online questionnaires. The guarantee of the participant's and the organisations' anonymity was granted.

4.10. Limitations

The quantitative approach fails to elicit authentic views from the study subjects (Rahman, 2017). People's opinions are often reduced to numbers, and it does not demonstrate the meaning and motivations of why people do things. This emanates from the perspective of the worldview, also called postpositivism, which defies the complete truth of knowledge and total positivity regarding our knowledge claims (Creswell & Creswell, 2018)

Quantitative research hypotheses are assumptions the researcher has before finding the answers. Therefore, the judgment was subjective and imposed upon the study participants, who could not provide their unqualified opinions regarding their survey

answers. It overlooked the participants' experiences and the intervention of social forces that give them the willingness to choose how to respond. Their views were not fully captured on the questionnaire. Therefore, the study did not elicit deeper insights and missed the opportunity to administer, interpret, assess, and explore the participants' behaviour, feelings, perceptions, and understanding (Rahman, 2017). It was evident that several participants responded further on the online platforms used to send the questionnaire for data collection, indicating that they had more to offer to the research over and above their survey responses.

Hair et al. (2017) discuss the weaknesses of first-generation techniques such as EFA, Analysis of Variances (ANOVA) and multiple regressions caused by the increasing number of researchers moving from first-generation to second-generation techniques in the past two decades. This study utilised the first-generation techniques due to its sample size, which was less than the 200 required by the second-generation techniques, like Partial Least Squares-Structural Equation Modeling (PLS-SEM) and Covariance Based-SEM (CB-SEM), which account for the measurement of errors (Hair et al., 2017). For example, the passive and aggressive reliability could have qualified in the evaluation of the HTMT, which addresses the standard errors that often distort the validity and reliability measurements, such as Cronbach's Alpha (Hair et al., 2017). For example, the reliability of PassiveOC and AggressiveOC, which had values less than 0.7, could have been improved had convergent and discriminant values been assessed.

The researcher took just a snapshot of a phenomenon; some information that would have emerged had this been a longitudinal study, did not because of the time limitations to complete the study. For example, the transition from full-time office bound to remote and hybrid work in most of the SA organisations could bring about more insights into the organisational culture changes in the South African business environment. Additionally, considering the magnitude of the workforce employed by the SA SOEs, the sample size of 170 respondents is insignificant to infer its statistics to the whole population.

Due to the quantitative research method having fixed approaches, the diversity and fluidity of modern society are seldom reflected, considering that the innovation that comes with the new generation that was born in the technology environment could have a wealth of knowledge that researchers have overlooked. From that perspective, the research structure could have considered a mediating or moderating

construct, such as transformational leadership and new generation workforce's voice, to mention but a few, to evaluate the alteration they could have brought to the current examined relationship based on those constructs.

4.11. Conclusion

To confirm or disconfirm the hypotheses, a quantitative research methodology was adopted. The study aimed to determine whether organisational culture impacts organisational innovation. A positivist deductive approach was applied, and data were collected to confirm the existing theory. This is a top-down approach as we proved the hypothesis from an existing theory. An online survey was followed for data collection, and 170 participants responded to a questionnaire. The following chapter discusses the analysis of the research results derived by the researcher using Excel for coding and IBM SPSS for statistical analyses.

Chapter 5: Analysis and Research Results

5.1. Introduction

The results of the statistical data analysis from the online survey are laid out and analysed in this section. After downloading the data from Google forms, an online data collection platform, data was cleaned and coded according to the SPSS qualifying requirements. Descriptive statistics were first performed after uploading a clean datasheet on SPSS to ensure that the sample was appropriate. This series of tests is essential as it is committed to identifying errors and anomalies in the data before analysing them and doing inferential statistics, which are done to make inferences about the population. The literature entails details about the impact of organisational culture on innovation (Ramirez et al., 2017; Scaliza et al., 2022). Therefore, tests were conducted using the data collected to confirm whether that relationship holds in this study's context.

The following discussions encompass the study's results, demographics, descriptive statistics, constructs and variables' reliability and validity, and then the exploratory factor analysis to ensure a relationship between organisational culture and organisational innovation is measured through appropriate factor-loaded variables. Then, the standardised residuals of the dependent variable were assessed for all the assumptions. This step preceded the testing of the hypothesis by performing the linear bivariate and multi-variate regression tests to establish whether a relationship between the constructs exists and the strength of those relationships. Then, a summary and conclusion discussion closes this section of the statistical findings.

5.2. Demographics

Data was collected from SA SOE employees, and it was used to analyse the impact of organisational culture on organisational innovation in their organisations. A total of 205 questionnaires were responded to; nine were from the pre-test participants, and 21 were from participants who do not work for SOEs. Therefore, 170 responses were valid and appropriate for statistical analysis.

5.2.2. Age

Table 2 indicates the age group distribution, and most respondents ranged between the 35 to 44 age group at 60%. That was followed by the participants ranging from 18 to 34 years old age group at 18.8%. The 56 to 65 age group received the lowest number of respondents at 2.9%.

Age	Frequency	Percent	Valid Percent
18 - 34 years old	32	18.8	18.8
35 - 44 years old	102	60	60
45 - 55 years old	31	18.2	18.2
56 - 65 years old	5	2.9	2.9
Total	170	100	100

Table 2: Respondents' age groups

5.2.3. Gender

The gender split, as seen in Table 3, indicates a slightly higher percentage of female respondents at 57.1% than males at 42.9%. There were no respondents from "Other and Preferred not to say."

Gender	Frequency	Percent	Valid Percent
Male	73	42.9	42.9
Female	97	57.1	57.1
Other	0	0	0
Prefer not to say	0	0	0
Total	170	100	100

Table 3: Table Respondents' gender and sexual orientation

5.2.4. Position level in the organisation

The percentages of junior professionals and supervisors were almost equal at 24.7% and 23.5%, respectively, as seen in Table 4, indicating the distribution of other levels of employment held by the questionnaire respondents.

Position	Frequency	Percent	Valid Percent
Junior professional	42	24.7	24.7
Supervisor	40	23.5	23.5
Specialist	24	14.1	14.1
Junior management	22	12.9	12.9
Middle management	25	14.7	14.7
Senior Management	10	5.9	5.9
Executive management	7	4.1	4.1
Total	170	100	100

Table 4: Positional Level of the respondents

5.2.5. Years employed in the organisation

Table 5 indicates the years the respondents were employed by the SOE when they participated in the research survey, with almost equal percentages of participants ranging between 11 to 15 years and 5 to 10 years at 32.4% and 30%, respectively.

	Frequency	Percent	Valid Percent
1 - 4 years	23	13.5	13.5
5 - 10 years	51	30.0	30.0
11 - 15 years	55	32.4	32.4
16 - 20 years	22	12.9	12.9
20+ years	19	11.2	11.2
Total	170	100.0	100.0

Table 5: Employment duration of the respondents

5.3. Descriptive Statistics

To analyse and assess the hypotheses, several variables were measured to calculate the two constructs of the study. Variables used to compute the total organisational culture (OC) construct were PassiveOC (approval, conventional, defendant and avoidance norms), AggressiveOC (oppositional, power, competitive and perfection norms) and ConstructiveOC (Achievement, self-actualising, humanistic- encouraging and affiliative norms). A list of descriptive statistics on the sub-constructs used to measure organisational culture can be seen in Appendix 6.

To evaluate organisational innovation, the measured variables used to calculate the total innovation constructs were exploitative and explorative innovation strategies (InnovStrat) and employee innovation variables (EmplyeeInnov). Appendix 6 indicates the descriptive statistics on the variables that measured organisational innovation.

The descriptive statistics in Table 6 below show the first three sub-constructs of organisational culture, and the last two measure organisational innovation together with their man values.

Descriptive Statistics							
	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PassiveOC	170	3.661	0.851	-0.427	0.186	-0.215	0.370
AggressiveOC	170	2.743	0.889	0.210	0.186	-0.256	0.370
ConstructiveOC	170	4.071	0.780	-0.934	0.186	0.910	0.370
InnovStrat	170	3.502	0.810	-0.618	0.186	0.365	0.370
EmplyeeInnov	170	3.093	0.527	1.392	0.186	3.143	0.370
Valid N (listwise)	170						

Table 6: Descriptive Statistics

5.4. Construct reliability test

This assessment ensures that the variables measure the constructs. Reliability was derived through Cronbach's Alpha tests. It is crucial to further compute reliability for the sub-constructs; therefore, tests were conducted for the following: PassiveOC, AggressiveOC, and ConstructiveOC for the organisational culture and InnovStrat and EmplyeeInnov for the organisational innovation.

Table 7 indicates that Cronbach's Alpha of PassiveOC was 0.567, AggressiveOC was 0.613, and Constructive OC was 0.752. PassiveOC initially derived a lower Cronbach's Alpha of 0.555. To improve it, one item (PassiveOC4_Avoidance norms) was deleted, and the researcher could not delete any additional items as the following values after the initial deletion were lower than 0.567. AggressiveOC's Cronbach's Alpha would have reduced at any deletion. Therefore, the researcher left it unaltered. ConstructiveOC's Cronbach's Alpha was 0.752. For the organisational innovation sub-constructs, InnovStrat has the highest radiality, 0.870, of all subconstructs, while that of EmplyeeInnov was 0.751. Further details of this assessment can be seen in Appendix 7.

Constructs	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	New Cronbach's Alpha	Final N of Items
PassiveOC	0.555	0.582	4	0.567	3
AggressiveOC	0.613	0.616	4	0.613	4
ConstructiveOC	0.752	0.763	4	0.752	4
InnovStrat	0.87	0.872	10	0.870	10
EmplyeeInnov	0.751	0.752	21	0.751	21

Table 7: Construct reliability

5.5. Validity

The three main types of validity are criterion, construct, and face. The ethical clearance committee confirmed the face validity by accepting the questions as valid for research. Criterion validity was evaluated together with construct validity (Daud et al., 2018), and were determined through the variables' inter-correlations using the Pearson correlation coefficients *(r)*. Therefore, it was crucial to run the reliability tests prior to validity (Hair et al., 2017) to assess the indicators' intercorrelations from reliable variables and constructs.

Appendix 8 indicates the different constructs' correlations. The three variables of organisational culture; were passive, aggressive and constructive had positive and significant correlations with the fundamental variables, with at least one correlation value being greater than 0.3 for all the variables. Furthermore, Appendix 8 also indicates the organisational innovation strategy and employee innovation subconstructs' correlations.

5.6. Confirmatory Factor Analysis (CFA)

It provides a cluster analysis of variables in a multidimensional approach and helps researchers establish a relationship between latent variables or factors and observable variables of the research study (Hair et al., 2017; Webster et al., 2015). Confirmatory Factor Analysis (CFA) provides a model fit by allowing an evaluation and substantiation of *a priori* determined constructs and their assigned variables' factor loadings; moreover, it tests for the validity and reliability of constructs (Hair et al., 2017).

CFA is restrictive and requires a 200-sample size. It is used to validate that variables have qualified to measure their specific latent construct (Hair et al.,2018). Therefore, due to its embedded restrictions, the researcher could not perform CFA on the constructs of this study as the sample size (170) was less than required. Exploratory Factor analysis, which is unrestricted in describing relationships (Peterson, 2000), was performed and is discussed in detail in the next section.

5.7. Exploratory Factor Analysis (EFA)

The 170-sample size is preferred for EFA since its objective is to uncover structures in the data. It reduces data sets by separating the highly correlated variables from

those that are less correlated, grouping them to create smaller groups of composite factors, and assessing the item-factor pairings (Webster et al., 2015; Hair et al., 2017). EFA was conducted on all the variables using principal components analysis (PCA) to manage multicollinearity.

At least one of the variables' multicollinearity should be equal to or greater than 0.3 to achieve minimum reliability and validity. The correlation matrix contained variables greater than 0.3 inter-correlations (Daud et al., 2018). To ensure that the PCA and factor analysis fit the various constructs, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test for sphericity were evaluated on the data (Hair et al., 2019).

An acceptable Kaiser-Meyer-Olkin (KMO) of a value above 0.5 was achieved, and Bartlett's test's statistically significant value below 0.05 ($p < 0.05$) was achieved for all the variables measuring the constructs, as seen in Table 8. Therefore, indicating a correlation among the variables, a suitable PCA for the constructs and these factors were analysed appropriately.

KMO and Bartlett's Test			
PassiveOC	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.619
	Bartlett's Test of Sphericity	Approx. Chi-Square	47.730
		df	3
		Sig.	<.001
	Components		1
AggressiveOC	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.606
	Bartlett's Test of Sphericity	Approx. Chi-Square	82.902
		df	6
		Sig.	<.001
	Components		1
ConstructiveOC	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.735
	Bartlett's Test of Sphericity	Approx. Chi-Square	186.029
		df	6
		Sig.	<.001
	Components		1
InnovStrat	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.889
	Bartlett's Test of Sphericity	Approx. Chi-Square	845.423
		df	45
		Sig.	<.001
	Components		3
EmplyeeInnov	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.902
	Bartlett's Test of Sphericity	Approx. Chi-Square	2156.233
		df	210
		Sig.	<.001
	Components		3

Table 8: Exploratory Factor Analysis

The first construct, with three variables, PassiveOC, AggressiveOC and ConstructiveOC, extracted one component each on the principal component analysis to measure organisational culture and was not rotated. Variables with factor loadings lower than 0.5 were removed from the components' matrix as Peterson (2000) states

that any factor loading with values 0.5 or higher is considered practically significant. Appendix 9 indicates the extracted components.

The second construct consists of two sub-constructs: InnovStrat and EmplyeeInnov. These variables' indicators were reduced to three components on the principal component analysis to measure organisational innovation. Factor loading values were greater than 0.5 and considered acceptable for further analysis (Daud et al., 2018).

5.8. Assessing data distribution normality

Data distribution normality was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk, which indicates a departure from normality if it yields values below or above zero. In addition, Skewness was tested to evaluate if data deviated from normality and to what extent there was distribution symmetry and Kurtosis to examine if the distribution peak or flatness (Hair et al., 2017). In addition, when data lack normality in its distribution, it may misrepresent the multivariate evaluation results (Hair et al., 2017).

The null hypothesis was accepted when the p-value > 0.05, as there was no statistically significant difference from a normal distribution. Table 9 indicates the normality of data distribution with the values p > 0.05 for both the organisational culture and organisational innovation.

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
OrganCutlure	0.051	170	.200[*]	0.988	170	0.168
OrganInnovation	0.058	170	.200[*]	0.990	170	0.302
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Table 9: Assessments of Normality

5.8.1. Organisational culture data distribution normality

Figure 5 of the organisational culture histogram below indicates the normality of the organisational culture data. The normal probability plot in Figure 5 below indicates some data points at the beginning, and the end floated away from the distribution line as see in Figure 6. Cases 150, 44, 21 and 72 were the outliers at the top whisker of the boxplot, and case166 at the bottom one, as seen in Appendix 10. However,

most data points are on the expected normal distribution Q-Q line, demonstrating that the organisational culture is normally distributed.
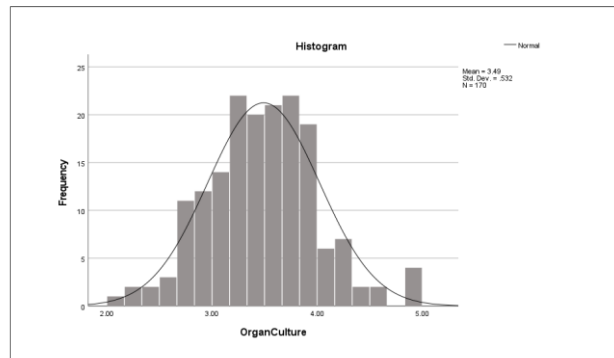
Figure 5: OrganCulture normal distribution curve
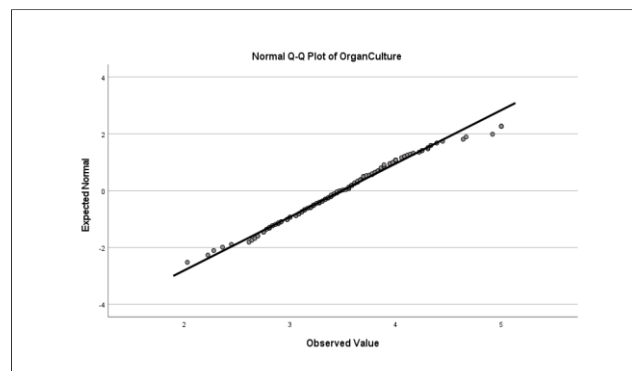
Figure 6: OrganCulture normal probability plot

5.8.1. Organisational innovation data distribution normality

The normal probability plot below shows some data points at the beginning and the end floating away from the line. However, most data lie on the expected normal distribution line. Therefore, this demonstrates that organisational innovation is normally distributed. Figures 7 and 8 below indicate the data distribution normality with cases 44 and 21 at the top whisker of the outlier boxplot, as seen in Appendix 10.
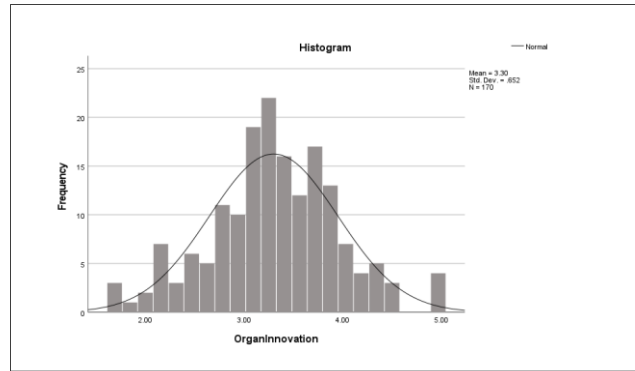
Figure 7: OrganInnovation normal distribution curve
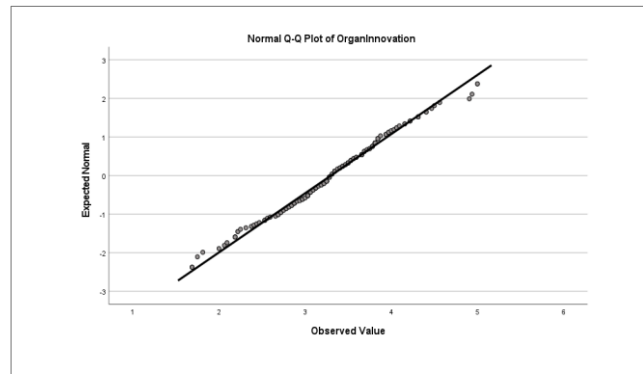
Figure 8: OrganInnovation normal probability plot

5.9. Correlation tests

5.9.1. Descriptives of the main constructs were assessed

The organisational culture descriptive statistics in Table 10 indicate a value of a standard deviation, median and mean of 0.53, 3.47 and 3.49, respectively. This construct was calculated by averaging the means of PassiveOC, AggressiveOC and ConstructiveOC subconstructs. Therefore, it was essential to assess the descriptives of the subconstructs.

Descriptives			Statistic	Std. Error
OrganCutlure	Mean		3.4913	0.04080
	95% Confidence Interval for Mean	Lower Bound	3.4108	
		Upper Bound	3.5719	
	5% Trimmed Mean		3.4818	
	Median		3.4722	
	Variance		0.283	
	Std. Deviation		0.53196	
	Minimum		2.03	
	Maximum		5.00	
	Range		2.97	
	Interquartile Range		0.67	
	Skewness		0.245	0.186
	Kurtosis		0.600	0.370

Table 10: Organisational culture descriptive statistics

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Organisational innovation for the study consists of Innovation strategy and employee innovation. These two sub-constructs were tested for validity and reliability. The EFA of the derived three components using PCA and the component matrix was assessed, and variable loading less than 0.5 were removed. The variables of innovation strategy loaded heavily on the first component – as seen in Appendix 9. Both the sub-constructs' variables that loaded greater than 0.5 were grouped into a composite factor and used for further analysis and to arrive at the construct of organisational innovation, and its descriptives are indicated in Table 11.

OrganInnovation	Mean		3.3004	0.05004
	95% Confidence Interval for Mean	Lower Bound	3.2016	
		Upper Bound	3.3991	
	5% Trimmed Mean		3.2987	
	Median		3.2813	
	Variance		0.426	
	Std. Deviation		0.65241	
	Minimum		1.69	
	Maximum		5.00	
	Range		3.31	
	Interquartile Range		0.83	
	Skewness		-0.018	0.186
	Kurtosis		0.248	0.370

Table 11: Organisational innovation descriptive statistics

5.9.2. The descriptives of the three cultural styles were assessed

5.9.2.1. Then the descriptives passive culture

The descriptive results of PassiveOC are in Table 12. They indicate that the median and average of the sub-construct are almost equal at 3.67 and 3.66, respectively, with a 0.85 standard deviation and skewness value between -1 and +1, which does not deem data non-normal and the kurtosis is neither flat nor peaked as the value lies between +1 and -1. Therefore, data is distributed normally, as seen in Figure 9.

			Statistic	Std. Error
PassiveOC	Mean		3.6608	0.06525
	95% Confidence Interval for Mean	Lower Bound	3.532	
		Upper Bound	3.7896	
	5% Trimmed Mean		3.6917	
	Median		3.6667	
	Variance		0.724	
	Std. Deviation		0.85078	
	Minimum		1.33	
	Maximum		5	
	Range		3.67	
	Interquartile Range		1.33	
	Skewness		-0.427	0.186
	Kurtosis		-0.215	0.37

Table 12: PassiveOC descriptive statistics
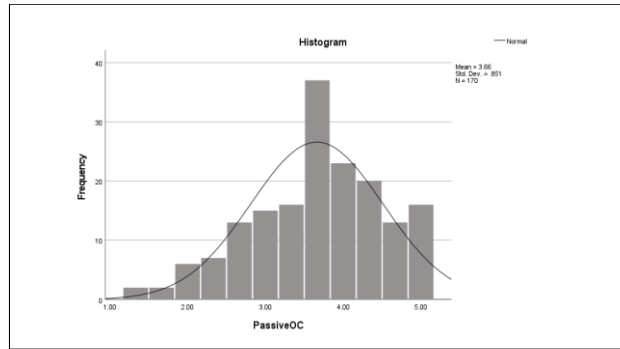
Figure 9: PassiveOC Histogram

5.9.2.1. Then the descriptives of an aggressive culture

AggressiveOC's descriptive statistics in Table 13 indicate the sub-construct mean of 2.74 and a median of 2.75 and that they are almost equal, with a 0.89 standard deviation. The skewness between -1 and +1 does not deem data non-normal, and the kurtosis is neither flat nor peaked as the value lies between +1 and -1. Therefore, data is distributed normally as seen in Figure 10 (Hair et al., 2019).

			Statistic	Std. Error
AggressiveOC	Mean		2.7426	0.06821
	95% Confidence	Lower Bound	2.608	
	Interval for Mean	Upper Bound	2.8773	
	5% Trimmed Mean		2.7288	
	Median		2.75	
	Variance		0.791	
	Std. Deviation		0.88938	
	Minimum		1	
	Maximum		5	
	Range		4	
	Interquartile Range		1.31	
	Skewness		0.21	0.186
	Kurtosis		-0.256	0.37

Table 13: AggressiveOC descriptive statistics
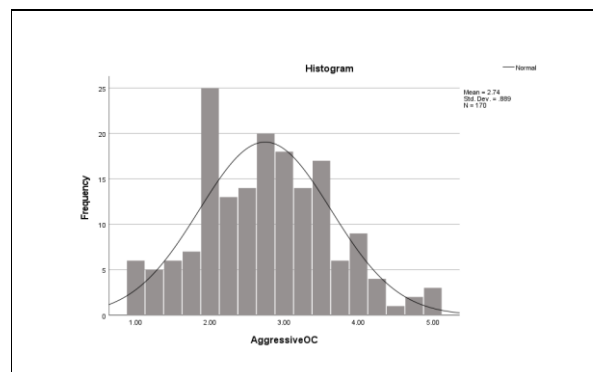
Figure 10: AggressiveOC Histogram

5.9.2.1. Then the descriptives of an aggressive culture

Table 14 shows the results of ConstructiveOC descriptive statistics. The mean and median of the sub-construct are almost equal at 4.07 and 4.25, respectively and a standard deviation of 0.78. Although the normal destruction curve is slightly and not substantially skewed to the right, its value lies between -1 and +1, therefore not deemed non-normal, and the kurtosis is neither flat nor peaked as the value lies between +1 and -1. Therefore, data is distributed normally, as seen in Figure 11.

			Statistic	Std. Error
ConstructiveOC	Mean		4.0706	0.05981
	95% Confidence Interval for Mean	Lower Bound	3.9525	
		Upper Bound	4.1887	
	5% Trimmed Mean		4.1315	
	Median		4.25	
	Variance		0.608	
	Std. Deviation		0.77984	
	Minimum		1.25	
	Maximum		5	
	Range		3.75	
	Interquartile Range		1.25	
	Skewness		-0.934	0.186
	Kurtosis		0.91	0.37

Table 14: ConstructiveOC descriptive statistics
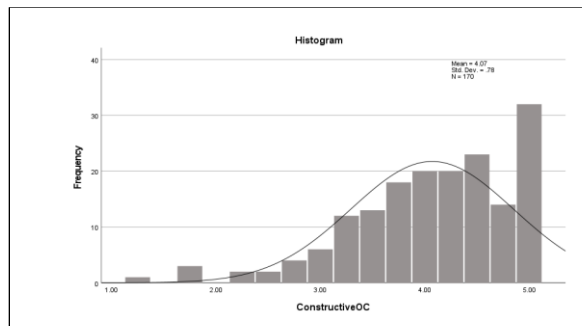
Figure 11: ConstructiveOC Histogram

5.10. Testing the hypotheses

5.10.1. Assessments of the multiple regression assumptions

5.10.1.1. Assumption of linearity

The assumption of linearity was assessed using the Pearson correlation, which revealed that linear relationships between organisational culture, PassiveOC and

ConstructiveOC with organisational innovation were significant. However, linearity was not achieved between AggressiveOC and organisational innovation, as seen in Tables 15 and 16, with a correlation coefficient of greater than 0.4, which is moderate (Muijs, 2022).

		OrganCulture	OrganInnovation
OrganCulture	Pearson Correlation	1	.408**
	Sig. (2-tailed)		<.001
	N	170	170
OrganInnovation	Pearson Correlation	.408**	1
	Sig. (2-tailed)	<.001	
	N	170	170
** Correlation is significant at the 0.01 level (2-tailed).			

Table 15: OrganCulture-OrganInnovation Pearson correlation

Correlations					
		PassiveOC	AggressiveOC	ConstructiveOC	OrganInnovation
PassiveOC	Pearson Correlation	1	.338**	-0.011	.163*
	Sig. (2-tailed)		<.001	0.892	0.034
	N	170	170	170	170
AggressiveOC	Pearson Correlation	.338**	1	-0.053	0.096
	Sig. (2-tailed)	<.001		0.496	0.212
	N	170	170	170	170
ConstructiveOC	Pearson Correlation	-0.011	-0.053	1	.547**
	Sig. (2-tailed)	0.892	0.496		<.001
	N	170	170	170	170
OrganInnovation	Pearson Correlation	.163*	0.096	.547**	1
	Sig. (2-tailed)	0.034	0.212	<.001	
	N	170	170	170	170
** Correlation is significant at the 0.01 level (2-tailed).					
* Correlation is significant at the 0.05 level (2-tailed).					

Table 16: PassiveOC, AggressiveOC, ConstructiveOC - OrganInnovation Pearson correlations

5.10.1.2. Assumption of multicollinearity

Variance Inflator Factor (VIF) was used to assess the multicollinearity assumption and to determine the degree of the collinearity between OrganCulture and OrganInnovation, and all VIF values, as indicated in Table 17, are less than 10. The tolerance values were also acceptable and indicated no multicollinearity, as tolerance should not be more than one as decided by the researcher as the cut-off threshold, VIF should not be greater than 10 (Hair et al., 2019), as any tolerance value > 1 might indicate multicollinearity.

Coefficientsa								
Model		Unstandardized Coefficients		Standardized	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.862	0.296		2.911	0.004		
	PassiveOC	0.109	0.052	0.143	2.117	0.036	0.886	1.129
	AggressiveOC	0.057	0.049	0.077	1.145	0.254	0.884	1.132
	ConstructiveOC	0.463	0.053	0.553	8.713	<.001	0.997	1.003
a Dependent Variable: OrganInnovation								

Table 17: Tolerance and VIF values

5.10.1.3. Assumption of Independence

For the assumption of independence assessment, the Durbin-Watson (DW) test statistic was used to determine whether the residuals are correlated or uncorrelated, as the desire is to have uncorrected residuals (Hair et al., 2017). Zero to four is an acceptable range for Durbin Watson. If the Durbin Watson is < 2, it indicates a positive correlation, and if DW> 2 negative correlation between the adjacent residuals, 2.037, as seen in Table 18, means standard residuals are uncorrelated.

Model Summaryb					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.577a	0.333	0.321	0.53749	2.037
a Predictors: (Constant), ConstructiveOC, PassiveOC, AggressiveOC					
b Dependent Variable: OrganInnovation					

Table 18: Model summary

5.10.1.4. Assumption of normality of standard residuals

To check normality in the regression analysis, standard residuals were assessed and compared to the normal distribution line, as seen in the Probability-Probability Plot Figure 12. The Histogram in Figure 13 indicates a normal distribution.
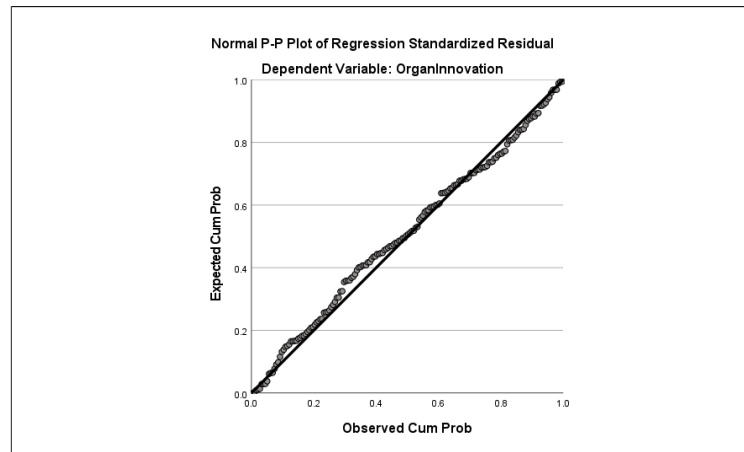
Figure 12: P-P plot
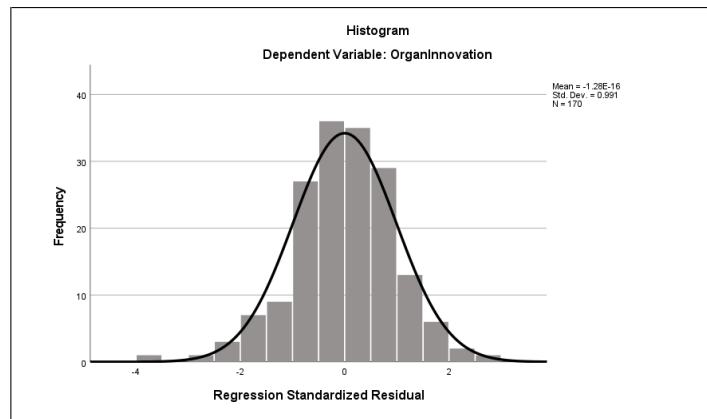
Figure 13: Normal distribution

5.10.1.6. Assumption of normality of homoscedasticity

Assumption of homoscedasticity is evaluated by using a standardised residuals' plot as seen in Figure 14; there are no issues relating to normality and linearity, as the data are lying in the centre, except a few outliers; cases 127 and 158 at the top whisker, and 169 and 31 at the bottom whisker as seen in Appendix 10.
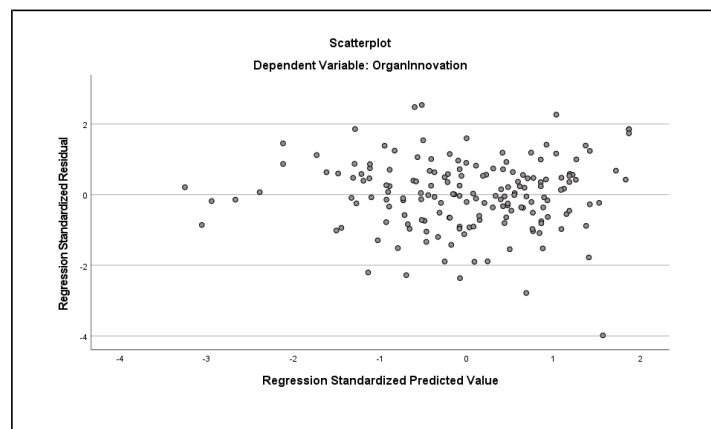
Figure 14: Standard predicted values plot

5.11. Analysis of the hypothesis

5.11.1. Hypothesis 1

Bivariate linear regression analysis was conducted first to check the impact of the relationship between the two constructs and then to address the study's main question. Table 19 presents the results. Organisational culture is shown as an average of means of the three cultures. Organisational innovation is shown as an average of the means of employee innovation and innovation strategy. It can be noted from this table that the beta values of organisational culture and organisational

innovation are 0.500 and 1.554, respectively. The F statistic of 33.352, P < 0.005, R^2 of 166 and the adjusted coefficient of determination (adjusted R^2) = 0.161 is also shown. Figure 15 shows a regression line (R^2 =0.166) on a scatterplot. The model summary and analysis of variance can be seen in Appendix 11.

H1: Organisational culture has a significant impact on organisational innovation

Hypothesis	Regression Weigts	Beta Coefficient	R^2	Adjusted R^2	F	t-value	p-value	Hypothesis Supported
H1	OC → OI	0.500 & 1.554	0.166	0.161	33.532	5.791	0.001	Yes

Table 19: The relationship between organisational culture and organisational innovation
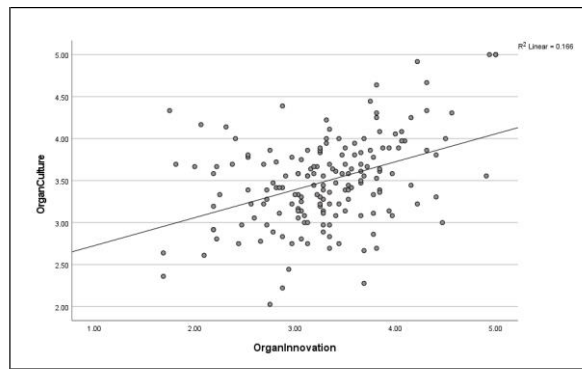
Figure 15: The impact of OrganCulture on OrganInnovation

Multiple regression tests derived the relationship, as seen in Table 20. This is a summary of the model summary and ANOVA and coefficients tables in Appendix 11.

Hypothesis	Regression Weigts	Unstandardised Beta Coefficients	R^2	Adjusted R^2	F	t-value	p-value	Hypothesis Supported
H1	OC → OI	0.862	0.333	0.321	27.665	2.911	0.004	Yes
H2	PassiveOC → OI	0.109				2.117	0.036	Yes
H3	AggressiveOC → OI	0.057				1.145	0.254	No
H4	ConstructiveOC → OI	0.463				8.713	0.000	Yes
Note:*p<0.05, OC: Organisational Culture, OI: Organisational Innovation								

Table 20: Multiple regression: the relationship between organisational culture and innovation

The researcher conducted bivariate linear regressions to test the strength of each of the three relationships. The values of adjusted R^2 are seen in Table 21. Figures 16, 17 and 18 are the scatterplots of the relationships between the three cultural styles and organisational innovation.

Hypothesis	Regression Weigts	Beta Coefficient	R^2	Adjusted R^2	F	t-value	p-value	Hypothesis Supported
H1	OC → OI	0.500 & 1.554	0.166	0.161	33.532	5.791	0.001	Yes
Note:*p<0.05, OC: Organisational Culture, OI: Organisational Innovation								
Hypothesis	Regression Weigts	Beta Coefficient	R^2	Adjusted R^2	F	t-value	p-value	Hypothesis Supported
H2a	PassiveOC —— OI	0.1248 & 2.843	0.026	0.021	4.572	2.138	0.034	No
H2b	PassiveOC → OI							Yes
Note:*p<0.05, OC: Organisational Culture, OI: Organisational Innovation								
Hypothesis	Regression Weigts	Beta Coefficient	R^2	Adjusted R^2	F	t-value	p-value	Hypothesis Supported
H3a	AggressiveOC —— OI	0.071 & 3.107	0.009	0.003	1.571	1.253	0.212	Yes
H3b	AggressiveOC → OI							No
Note:*p<0.05, OC: Organisational Culture, OI: Organisational Innovation								
Hypothesis	Regression Weigts	Beta Coefficient	R^2	Adjusted R^2	F	t-value	p-value	Hypothesis Supported
H4a	ConstructiveOC —— OI	0.458 & 1.436	0.300	0.295	71.879	8.478	0.000	No
H4b	ConstructiveOC → OI							Yes
Note:*p<0.05, OC: Organisational Culture, OI: Organisational Innovation								

Table 21: Multiple regression organisational culture and organisational innovation

5.11.2. Hypothesis 2

The impact of passive organisational culture on organisational innovation

Figure 16 indicates the positive relationship with a regression line ($R^2 = 0.026$).

- H2a: Passive organisational culture does not have a significant impact on organisational innovation
- H2b: Passive organisational culture has a significant impact on organisational innovation
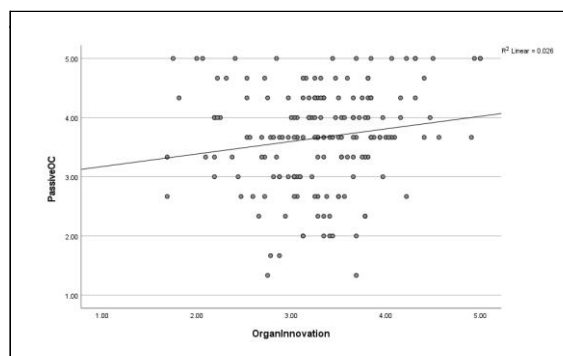
Figure 16: PassiveOC and OrganInnovation regression scatterplot

5.11.3. Hypothesis 3

The impact of aggressive organisational culture on organisational innovation

Figure 17 indicates the positive relationship with a regression line ($R^2 = 0.009$).

- H3a: Aggressive organisational culture does not have a significant impact on organisational innovation
- H3b: AggressiveOC organisational culture has a significant impact on organisational innovation organisational innovation
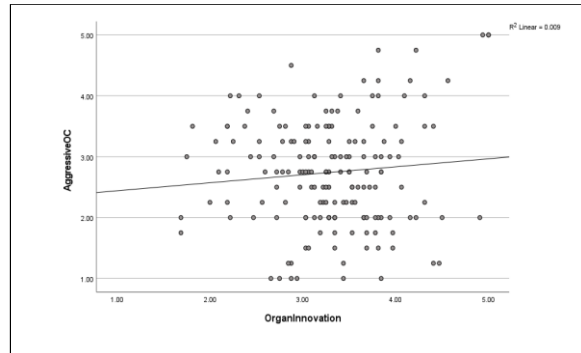
Figure 17: PassiveOC and OrganInnovation regression scatterplot

5.11.4. Hypothesis 4

The impact of Constructive organisational culture on organisational innovation

Figure 18 indicates the positive relationship with a regression line ($R^2 = 0.300$).

- H4a: Constructive organisational culture does not have a significant impact on organisational innovation
- H4b: Constructive organisational culture has a significant impact on organisational innovation organisational innovation
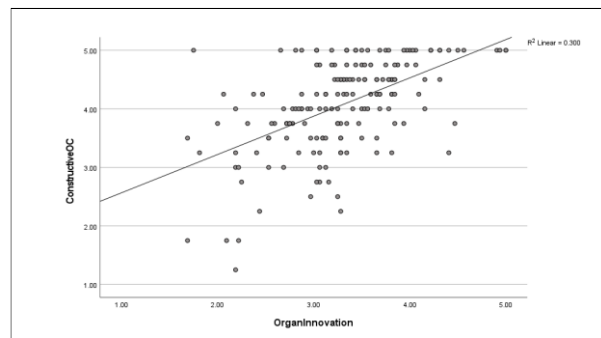
Figure 18: ConstructiveOC and OrganInnovation regression scatterplot

5.12. Summary of results

The study aimed to understand the three types of organisational culture, as per Cooke (Cooke & Szumal, 2013) and how they affect organisational innovation.

The results indicated that SOEs' employees do not have a different perspective on the organisation's culture. The differences in the mean statistics age groups, gender, years of employment, and position held at work do not play a part in determining the relationship between organisational innovation and organisational culture.

The construct reliability and validity were assessed. The descriptive statistics were analysed, the normality of data was indicated, and a few outliers were spotted; however, they did not distort the normality. Assessments for the regression assumptions were conducted before the multiple regression tests were conducted to confirm or disconfirm the study's hypotheses.

The multiple regression assumptions and the assessment of the relationship results revealed a significant impact that organisational culture has on innovation in the SOEs of South Africa. When delving deeper into these hypotheses, no significant relationship was derived between AggressiveOC and organisational innovation. Furthermore, PassiveOC and ConstructiveOC were the predictors of organisational innovation. The results of the hypotheses testing revealed the following:

H1: Organisational culture has a significant impact on organisational innovation – **Hypothesis supported**

H2a: Passive culture does not have a significant impact on organisational innovation - **Hypothesis not supported**

H2b: Passive culture has a significant impact on organisational innovation - **Hypothesis supported**

H3a: Aggressive culture does not have a significant impact on organisational innovation- **Hypothesis supported**

H3b: Aggressive culture has a significant impact on organisational innovation – **Hypothesis not supported**

H4a: Constructive culture does not have a significant impact on organisational innovation - **Hypothesis not supported**

H4b: Constructive culture has a significant impact on organisational innovation - **Hypothesis supported**

The findings and discussion of the results are done in the following chapter.

Chapter 6: Findings and Discussion of the results

6.1. Introduction

This study's objective was to determine whether the three organisational cultural styles, passive, aggressive, and constructive, proposed by Cooke and Lafferty (1987), have an impact on the SA SOEs' organisational innovation. Due to there being a wealth of research in this field and literature having indicated the impact organisational culture has on innovation, the focus of this was to serve a purpose in terms of adding to the debate and assisting in filling a gap in the context of public sectors in a developing country (Scaliza et al., 2022). Most importantly, it was to find a cultural style conducive to innovation. Data was collected, and research results are stated and analysed in the previous chapter 5; therefore, this section discusses the results and the findings.

6.2. Demographics

6.2.1. Age groups of respondents

While the more significant part of the respondents was from the 35 to 77 years old age group at 60% of the sample, the population demographics were represented as all the employable age groups have responded to the survey, and their descriptive statistics were studied to be able to infer to the larger population. The analysis of variances, seen in Appendix 12, indicates that the differences among the means of the age groups are not statistically significant with P > 0.05.

A part of the business rationale for this study was to discover how the different generations employed by the SOEs perceive culture in those organisations. Moreover, there is no difference in perceptions of innovation culture between different age groups, as found by Newman et al. (2019), Lei et al. (2019), and Bayhan and Korkmaz (2021). Furthermore, considering SOEs' importance in the national economy through curbing unemployment, their workforce is populated by different generations and hardly ever retrench employees (Rabilall, 2017; Lekgothoane et al., 2020). For example, almost 3% of the employees are between the ages of 56 to 65 and are likely to retire at 65. This indicates the capability of SOEs to keep employees for a long time. This may distort the culture as the generation may become reluctant to accept the changes the youth have to offer, especially regarding innovation.

6.2.2. Gender

The female respondents' percentage was 14.2% higher than the male respondents. Gender as a predictor of organisational culture should be the target of future research (Lekgothoane et al., 2020). Lei et al. (2019) demonstrated no difference in the gender perception of innovation culture. It can be seen in Appendix 12, where $p > 0.05$, therefore inferring that there was no significant difference in the variation of both genders' means. Therefore, this does not influence the relationship between the two constructs. As a result, the researchers in this field should concentrate more on gender roles and how they influence innovation to establish compelling reasons for considering the organisational culture style favourable for innovation (Tian et al., 2018).

6.2.3. Position

Position level was included in the study to determine whether employment positions may affect SOEs' culture and the innovation of their employees. Six position levels, namely, junior professionals, supervisors, junior, line, middle, and executive management levels, were included in the study, covering the population of SA SOEs' employees. Lei et al. (2019) found no difference in how people in different work positions perceive innovation culture. The result of this study supported Lei et al. (2019), as it revealed that employment position level does not predict the culture and innovation in the organisations SA SOEs studied in this paper, as seen in Appendix 12.

6.2.4. Years of employment

This demographic was included to assess whether employment tenure could contribute to the relationship between the studied constructs. When employees are fresh from college or new in the organisation, they are zealous towards innovative activities as opposed to older employees who are accustomed to the routine. Bayhan and Korkmaz (2021) found a significant difference in cultural perceptions based on employment duration. Positive perceptions about innovative organisational culture emerged from employees employed for less than a year, while negative perceptions from those employed for 16 to 20 years.

This study's results, however, revealed no difference in how people with different years of work experience perceive innovation and organisational culture. Years of experience in an SOE do not predict the culture and innovation in the organisations involved in the study, as seen in Appendix 12. Lei et al., 2019 also found no

significant difference, and Krause and Vanhove (2022) suggested that future research on the influence of years of employment on organisational culture should be undertaken.

6.3. Organisational culture

The Cooke and Lafferty (1987) model of organisational culture consists of the cultural dimensions studied in the paper to examine whether they play a part in changing organisational innovation in South African SOEs. The original theoretical model tests 120 items of the three styles; however, this study assessed only 12 indicators of the summarised instrument (Krauss & Vanhove, 2022). This model suggests that the culture represents the firm's personality, as it states that it is how members of varying backgrounds behave to fit in. Therefore, the survey asked questions in the following manner "I am expected to please my superior; this way, the researcher got to capture the character of the personality that employees identify with. From that perspective, we could measure that this construct measured the means of the three subconstructs.

This construct was measured on a five-point Likert scale. PassiveOC yielded a mean of 3.66, AggressiveOC had a mean of 2.74, and ConstructiveOC was 4,07. This means that SOE employees resonated and identified more with the constructive organisational culture with the highest mean of the three cultures.

Each sub-construct examined four indicators, confirming construct validity on the Pearson correlation coefficient, which revealed that all constructs had at least one item that has =/> 0.3 relationship value. However, when reliability tests were conducted, these yielded lower than 0.7 Cronbach's Alpha values for the PassiveOC, even after deleting an indicator to improve it. AggressiveOC had no chance of improving as deleting any indicator further plummeted the value. To improve the reliability of PassiveOC, question four, which tested avoidance norms: "I am expected to shift responsibilities to others and avoid any possibility of being blamed for a problem", was removed from the list of indicators.

About this study's context, little is known; therefore, based on the suggestion of Daud et al. (2018), Pallant (2002), and Nunnally and Bernstein (1994) on how to analyse variables with a moderately acceptable Cronbach's Alpha between 0.6 to 0.8. Moreover, considering the limitations of Cronbach's Alpha, that it yields relatively

low-reliability values as it is a conservative measure, "it is sensitive to several numbers on the scale and generally tends to underestimate the internal consistency reliability" (Hair et al., 2017, p.111). Therefore, the researcher continued to assess the relationships with the said variable as the study is exploratory and aims to confirm or disconfirm a theory that has existed for many decades in a new context.

The research was conducted as planned, and all variables were evaluated and regressed with the dependent variable. The results revealed a relationship between organisational culture and organisational innovation. The computation of the organisational culture constructs included averaging the means of PassiveOC, AggressiveOC, and ConstructiveOC and regressing it with organisational innovation, a combination of the InnovStrat and EmplyeeInnov. An additional calculation excluded the mean of PassiveOC as it yielded a Cronbach's Alpha = 0.567; this was done to test whether continuing with a moderately reliable variable was not distorting the statistics.

The data and regression assumptions tests were conducted and were all clear and appropriate to continue testing the hypothesis.

This assessment was done to verify that the study's results meet the study's objective. The two relationships (Including and excluding PassiveOC) yielded a statistically significant relationship between organisational culture and innovation (at adjusted R^2 = 0.321 and 0.301, respectively. Therefore, including PassiveOC improves the statistically significant relationship strength by 2% - as seen in Appendix 11. This suggests that a statistically significant relationship remains even when excluding PassiveOC, but the strength of the relationship slightly decreases. This might be because adjusted R^2 decreases due to data over-fitting when more independent variables are added to the regression model (Hair et al., 2019). However, for this study, including the PassiveOC variable increased the adjusted R^2.

6.4. Organisational innovation

This construct consisted of innovation strategy and employee innovation as subconstructs. Their validity and reliability were achieved, EFA was completed, and each factor yielded three components, of which all their items were highly loaded in the first component respectively. The items removed from the components had lower than 0.5 factor loadings, and only one component per factor was acceptable and

qualified for the computation of the organisational innovation construct that the researcher utilised to test the hypotheses, which were investigating:

The relationship between PassiveOC and organisational innovation

The relationship between AggressiveOC and organisational innovation

The relationship between ConstructiveOC and organisational innovation

The hypotheses models above have organisational innovation items; however, the study focused on the corporate intention to achieve a competitive edge through achieving their innovation goals. Therefore, one of the innovation dimensions that were tested was innovation strategy (Chen et al., 2018). In addition, organisational innovation results from individuals' creative thinking and ability to utilise their voices to foster an innovative climate, as found by Shin et al. (2022). However, the organisation's values will either enhance or hamper innovation; therefore, the study tested variables such as tolerance for failure, enabling resources, diversification in thinking, and inclusive decision-making.

The findings indicated the South African SOEs identified more with employee innovation which had a mean statistic of 3.59, and innovation strategy had a mean of 3. This indicated that the participants leaned towards the "agree" option, with the indicators mostly phrased as "Creativity is allowed here" and "I am allowed to think and solve problems differently from the rest." (Scott & Bruce, 1994). This could have been the reason for the mean being higher in this category than the innovation strategy because employees could respond from their perspective as it required less analysis and thought to respond as the indicator was based on employee experience.

The questionnaire assessed employees' knowledge about the organisation's offerings regarding the innovation strategy dimension. The assessment indicators included items such as, "Our products have unique features that are not available in competitors' offerings, and Our products are highly innovative." As employees are responding on behalf of the company, it could be challenging when one does not have accurate information and cannot comprehend the whole concept in a short period. Therefore, participants selected the neutral response "3" to most questions to avoid over-analysis.

6.5. Organisational culture and organisational innovation

The regression technique was used to find the strength of the relationship between the dependent variable, organisational innovation, and the independent variable, organisational culture. Firstly, the relationship between the two constructs was tested to confirm the positive correlation that was determined initially in the dataset.

To find results for the hypothesis H_1, the mean of three variables; PassiveOC, AggressiveOC, and ConstructiveOC, were computed using item parcelling to determine the organisational culture construct, so were the mean of the two variables of the organisational innovation construct; InnovStrat and EmplyeeInnov. It is established that culture impacts innovation in South African SOEs. However, it was essential to examine the impact of each cultural style on organisational innovation, and for each relative assessment, we compared the regression coefficient (b).

6.6. Discussions on the hypotheses results:

6.6.1. Hypothesis 1

A multiple regression analysis, which was appropriate for this study with multiple independent variables (Hair et al., 2019), was run and revealed a significant relationship between organisational innovation and organisational culture. A beta (β) value of 0.862 indicated that a change in a unit of organisational culture causes a 0.862 change in organisational innovation. Moreover, $p < 0.05$ indicates that the organisational culture significantly affects organisational innovation at a 95% confidence level.

Adjusted R^2 is appropriate as it considers the model's number of predictor variables. Thus, according to these results, organisational culture has a positive impact on innovation, with the adjusted $R^2 = 0.321$, thus implying that a 32.1% change in organisational innovation can be directly attributable to organisational culture. The significant relationship is supported by the t-value of 2.911, greater than the 1.96 critical value at a 0.05 significance level (Hair et al., 2019). This is visible in Table 22.

Hypothesis	Regression Weigts	Unstandardised Beta Coefficients	R^2	Adjusted R^2	F	t-value	p-value	Hypothesis Supported
H1	OC → OI	0.862	0.333	0.321	27.665	2.911	0.004	Yes
H2	PassiveOC → OI	0.109				2.117	0.036	Yes
H3	AggressiveOC → OI	0.057				1.145	0.254	No
H4	ConstructiveOC → OI	0.463				8.713	0.000	Yes
Note:*p<0.05, OC: Organisational Culture, OI: Organisational Innovation								

Table 22: Multiple regression: the relationship between organisational culture and organisational innovation

6.6.2. Hypothesis 2

The tests revealed a statistically significant relationship, meaning that PassiveOC affects organisational innovation, as the $p < 0,05$, beta $= 0.109$, a unit change in PassiveOC changes organisational innovation by 0.109 units. Further analysis was conducted per construct to assess adjusted R^2 per organisational culture variable and for PassiveOC $= 0.021$. Thus, any 2.1% change in organisational innovation can be attributable to the PassiveOC, as seen in Appendix 11.

A regression analysis was performed to confirm or disconfirm H2: PassiveOC positively affects organisational innovation. The relationship between the two factors was significant, with beta $(\beta) = 0.109$ and $p < 0.05$ at a 95% confidence level, indicating that the passive organisational culture significantly affects organisational innovation. Therefore, it is safe to reject H2a and accept H2b. A change in organisational innovation is attributable to PassiveOC. The significant relationship is supported by the t-value of 2.117, greater than the 1.96 critical value at a 0.05 significance level (Hair et al., 2019). Please see Table 22 above.

Table 23 indicates an additional bivariate regression conducted per construct to assess hypotheses and determine the strength of the relationships between each cultural style and the outcome variable. The results revealed a statistically significant relationship, meaning that PassiveOC affects organisational innovation, as the $p < 0,05$, beta $= 0.1248$. This further analysis revealed an adjusted R^2 per variable of organisational culture. PassiveOC's adjusted $R^2 = 0.021$; thus, any 2.1% change in organisational innovation can be attributable to the PassiveOC. Therefore, we failed to reject H4b and did not accept H4a.

Hypothesis	Regression Weigts	Beta Coefficient	R^2	Adjusted R^2	F	t-value	p-value	Hypothesis Supported
H2a H2b	PassiveOC —— OI PassiveOC → OI	0.1248 & 2.843	0.026	0.021	4.572	2.138	0.034	No Yes

Table 23: Impact of PassiveOC on organisational innovation

A passive culture is characterised by less questioned authority, and an employee's competence is determined by adhering to rules and procedures. Therefore, this relationship, although weak is, confirming the SOEs' lack of autonomy. However, the surprising aspect about this is that when employees follow exact instructions and are not keen to or are not allowed to question their superiors, creative thinking gets stifled, which would mean that an increase in such an environment would only cause a decline in members' willingness and interest to ideate and potentiate their innovativeness.

A passive culture is similar to Cameron and Quin's (2006) hierarchy culture, favouring policies, rules, and procedures, which could hinder agility. In confirmation of this study's findings, Naranjo-Valencia et al.'s (2011) found a significant positive relationship between and asserted that procedures and formal polices and rules foster innovation when formalities are not the leading shared value among members because it would hamper innovation. In contrast to our results, Scaliza et al. (2022) found that hierarchy culture did not significantly affect inbound innovation with $p > 0.05$. The authors base their reasoning on organisations that are more control oriented as opposed to focusing on innovation.

6.6.2. Hypothesis 3

In AggressiveOC, no relationship was found between culture type and organisational innovation. With $p > 0.05$ at a 95% confidence level, the aggressive organisational culture does not significantly affect organisational innovation. Therefore, any change in organisational innovation cannot be attributable to AggressiveOC. As seen in Table 24, we failed to accept H3b, as H3a was accepted. Thus, the AggressiveOC does not impact organisational innovation.

Hypothesis	Regression Weigts	Beta Coefficient	R^2	Adjusted R^2	F	t-value	p-value	Hypothesis Supported
H3a	AggressiveOC —— OI	0.071 & 3.107	0.009	0.003	1.571	1.253	0.212	Yes
H3b	AggressiveOC → OI							No
Note:*p<0.05, OC: Organisational Culture, OI: Organisational Innovation								

Table 24: The impact of ConstructiveOC on organisational innovation

AggressiveOC is characterised by unhealthy competition, a lack of information sharing, and members working in silos to fulfil their power needs. This culture is not prevalent in the SOEs, and the potential reason could be that SOEs' primary goal is not to maximise profits. Therefore, employees do not get rewarded for bringing more clients to the business or reaching sales targets, which is why employees in some POEs would be in unhealthy competition. Because they boost their esteem when they win in that aspect, from that perspective, the disconfirmation of this hypothesis is somewhat aligned with the nature of the SOEs' business.

6.6.4. Hypothesis 4

Regarding ConstructiveOC's impact on organisational innovation. The beta (β) value of 0.463 and $p < 0.05$ at a 95% confidence level indicated that the ConstructiveOC significantly affects organisational innovation. According to these findings, there is a positive direct impact of ConstructiveOC on organisational innovation. The significant

relationship is supported by the t-value of 8.713, which is more significant than the 1.96 critical value at a 0.05 significance level (Hair et al., 2019), as seen in Table 19. From the additional assessment to find the relationship strength, it was revealed that the adjusted correlation coefficient (R^2) = 0.295, which means that a 29.5% change in organisational innovation results from some change in ConstructiveOC, as seen in Table 25. Therefore, H3b could not be rejected, as H3a was not accepted based on the findings.

Hypothesis	Regression Weigts	Beta Coefficient	R^2	Adjusted R^2	F	t-value	p-value	Hypothesis Supported
H4a	ConstructiveOC —— OI	0.458 & 1.436	0.300	0.295	71.879	8.478	0.000	No
H4b	ConstructiveOC → OI							Yes
Note:*p<0.05, OC: Organisational Culture, OI: Organisational Innovation								

Table 25: Impact of ConstructiveOC on organisational innovation

Due to its characteristics, such as a positive and high regard for one another in the firm, collectively solving problems, and information sharing through effective and open communication ConstructiveOC. Therefore, it has a direct and positive influence on innovation because members are liberated and free to express their ideas. This finding was unexpected, especially considering the inefficiency and poor performance in the South African SOEs (Mputing, 2021). Although culture might be an ingredient of innovativeness, it is not the absolute predictor of innovation. Therefore, inadequate, and inefficient innovation could be caused by other factors, and culture could be the only positive predictor of innovation. Therefore, culture could be the only contributor to innovation improvement in SOEs.

South African SOEs have revealed in the results that they have a constructive culture, meaning that they have a free flow of information and effective communication and they work in collaboration rather than competition. While in a constructive organisational culture, members create an environment that ensures they develop, satisfy and value one another while executing strategies. Members are driven by value-adding factors such as fulfilment, teamwork, and goal attainment.

Compared to Scaliza et al.'s (2022) findings about the Cameron and Quinn's (2006) clan culture as the predictor of inbound innovation. The clan culture has characteristics of openness and loyalty; leaders act as mentors to workers, and members support one another's interests. This is a stimulus to openness and innovation; in their paper, the clan culture significantly impacted inbound innovation as it encourages members to transfer knowledge among one another.

This is the culture that is aligned with innovation-promoting strategies. However, SOEs have been continuously performing poorly. The reason could be the lack of autonomy due to its ownership structure and relying only on the innovation department to create ideas that keep the organisation in operation and relevant. Therefore, it leads to rendering people in other departments redundant regarding ideating and bringing forth their ideas, plans, and execution strategies. These ideas could also bring benefits such as cost savings, efficiency to the processes, and an increase in turnover.

6.7. Summary of the discussion

6.7.1. Demographics

The relationships between gender, age, employment level, and tenure to organisational culture and innovation are not statistically significant ($p > 0.05$). Therefore, it can be said that there is no difference in how South African SOEs' employees perceive the relationship between organisational culture and innovation. Other researchers also demonstrated this (Newman et al., 2019; Lei et al., 2019; Bayhan & Korkmaz, 2021; Lekgothoane et al., 2020).

6.7.2. Results of the hypotheses

Further discussions were provided on confirming and disconfirming the hypotheses. The findings indicated that AggresiveOC does not influence organisational innovation with a $p > 0.05$. Hair et al. (2019) consider the strength of $<0.25 – 0.39$ to be weak, 0.4 - 0.5 as moderate, and 0.75 and above as strong. Therefore, although the relationships' strength was weak to moderate with R^2 of 2.1% and 29.5%, for PassiveOC and ConstructiveOC, respectively, they were found to have a significant influence on innovation with p-values < 0.05. Figure 17 indicates the hypothesis structure, with the red and green solid lines representing the rejected and accepted hypotheses, respectively. The green dotted line, as accepted, has a significant impact with weak relationship strength.
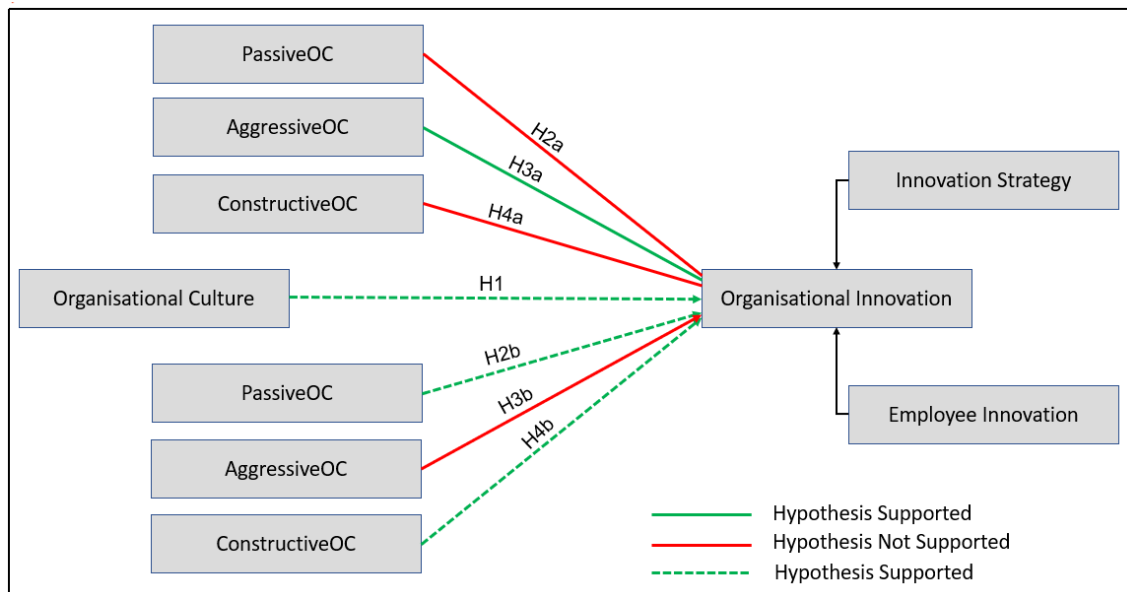
Figure 19: The model of hypotheses' results

6.8. Conclusion

Over several decades, literature has proven the richness of research on the effects of organisational culture theories on innovation (Büschgens et al., 2013). However, the model offered by this study is a new insight into the Cooke and Latterty (1987) organisational culture theory within the South African public sector context. Naranjo-Valencia et al. (2011) found that organisational culture impacts innovation strategy, and its effects could be positive or negative; however, their paper focused on adhocracy and hierarchy cultures. While Scaliza et al. (2022) tested this relationship based on Cameron and Quinn's (2006) four cultural types, this study investigated how the passive, aggressive and constructive cultural dimensions affect the innovation strategy and employee innovation under the organisational innovation umbrella.

This study's findings indicated the positive impact of the organisational culture in SOEs, comprised of PassiveOC and ConstructiveOC, on organisational innovation. Although the p-value<0.005 indicated innovation's relationship with PassiveOC, it is a direct and statistically significant predictor of innovation, with a weak adjusted $R^2 <$ 0.25. SOEs are partially and wholly owned and controlled by the state, and their leaders' autonomy is limited.

The PassiveOC-Innovation relationship contrasts the literature's suggestion that an organisation requires a culture that would stimulate innovation, and authors are still

uncertain of the kind or style. However, there is a suggestion from the literature on innovation conducive to cultural styles. For instance, Scaliza et al. (2022) investigated the effects of organisational culture on the innovation ecosystem, open innovation, and firm performance by applying the Cameron and Quinn's (2006) theory. The authors suggested that could be detrimental to an individual with a creatively open mind.

Further tests were conducted to verify which two dimensions of innovation related mostly to PassiveOC. The result showed that PassiveOC is not a significant predictor of innovation strategy but predicts employee innovation. The potential reason for this might be in the high-level description of innovation strategy, which is the outlined plan of innovation's objective achievement (Chen et al., 2018), and employees could have been unable to conceptualise the whole process as individuals at the time of data collection.

Chapter 7: Conclusion and recommendations

7.1. Introduction

This chapter provides an overview of the study, outlines the recommendation and the implications of the study in the business and academic environments, and states the study's limitations and the potential future additions to the study that will enable a constructive debate on the subject.

7.2. Principal conclusions

While innovation contributes towards the firm's competitive edge and fuels economic growth (Naranjo-Valencia, 2011; Iqbal et al., 2019), organisational culture is an influential ingredient firms add to their strategy implementation. It has previously been paired with organisational and innovation performance, innovation climate, innovation strategy (Chen et al., 2018), innovative capabilities (Ramirez et al., 2017), operational efficiencies, and innovation ecosystem (Wu et al., 2019; Scaliza et al., 2022; Shaya & Zhou, 2019; Lei et al., 2019), where the aim was to establish a culture that is conducive to innovation in different industries.

To find the fit between the two constructs, tests and assessments of this relationship were performed by various authors to find the effects of organisational culture on innovation, according to the respective culture theories they applied. Although their tests derived different results, the most crucial takeaway was that a relationship exists between the two concepts.

This study's aim was met, the problem was stated, the relationship was investigated, and the results were presented and analysed. The findings revealed that South African SOEs embrace a combination of passive and constructive organisational cultures, and their impact was significant on organisational innovation. In addition, aggressive culture was found not to affect innovation in this context.

7.3. Practical implications

The findings of this study could potentially be applied to various organisations in the same context and other developing countries. This study's findings will contribute to the theoretical and business debate through the following implications:

7.3.1. Theoretical contributions

SOEs worldwide have a crucial role in economic development and growth. They are an approach government took to participate in the market and serve communities commercially. Moreover, information, when disseminated, is a powerful resource that facilitates company and economic growth because it evokes thought and ultimately breeds innovation. From that notion, constructive culture's characteristics of freedom and effective communication, ensuring efficient information sharing, where members value one another while implementing strategies, link this culture to innovation promotion.

Constructive culture promotes and encourages employees to ideate and allows for psychological safety, as employees are included and free to communicate and share ideas without fear of judgement. This study indicates this through the constructive culture's impact on organisational innovation and expands on existing cultural styles that improve innovation.

Passive culture also affects innovation, however, in a different dimension. In this culture, employees are discouraged from thinking differently. While this could hinder innovation, it could also mean that the superiors are creative in setting their processes and rules and procedures and how they instruct workers under this cultural style to affect organisational innovation positively. However, this revelation was not anticipated by the researcher and could evoke a debate around innovation and the cultures that stimulate it.

This study enhances knowledge in the Human and organisational behaviour field of study. Moreover, it responds to Shayah and Zehou's (2019) call to conduct supplementary research on the various cultural models in other sectors and countries. Furthermore, Tõnurist (2015) called for further innovation analysis in the public sector, as most researchers refer to China as a benchmark when conducting research in the SOEs. Therefore, this study's findings will add to that knowledge and spark scholarly discussions.

7.3.2. Business and management implications

SOEs will remain an important tool the state uses to create value and address socio-economic issues for its stakeholders. Thus, they should prepare for a better future, which translates to a better economy. From the findings, employees are committed to these organisations based on the cultural styles they associate with. The passive culture is characterised by employees adhering to the process and following instructions, and the constructive culture ensures the continuous flow of information. This indicates that employees of South African SOEs are involved and committed to their organisations, making these entities viable to climb mountains of success (Sahoo & Sahoo, 2018). Therefore, employing considerate, ethical, and responsible leaders to lead and manage these companies could lead them to a better future.

SOEs produce goods and services that the POEs can produce with more efficiency and effectiveness. Therefore, competition from the international and the POE sector is growing, and to maintain a growing economy, SOEs should remain in operation and relevant. To that end, it is essential to have employees aware of their potential to think creatively and innovate and bring ideas forth. That could be achieved through cultivating a culture that prioritises innovation in all aspects of the business. Schein (1985) suggested that culture is the responsibility of leadership; thus, they may cultivating a culture that allows for employee voice and inclusion.

Organisational culture could be a tool South African SOEs could exploit to reposition themselves and other public companies and not emphasise the reliance on the state. Because that creates a perception that the State will take care of the SOE if it fails (Belloc, 2014; Armenakis et al., 2011)

SOEs operations mainly involve a particular process, for instance, it could be manufacturing, generating, logistical service, or a telecommunication system, and innovation in those environments is defined as an introduction of a new process or service or an alteration of the existing process or system (Chen et al., 2018). Considering the nature of the repetitiveness of daily activities, employees would require motivation beyond a constructive culture to stimulate their innovativeness. From that observation, it was found that innovation in such processes requires a culture that provides psychological safety (Baer & Frese, 2003). Therefore, ensuring employees' mental health and well-being are the pinnacles of the organisation.

When an organisational culture is appropriate and aligned with the firm's strategy, it plays a critical role as an intangible asset responsible for the firm's competitive edge and the desired goal of attaining strategic execution (Ramirez et al., 2017). With its ability to propel companies in the right direction, Guo et al. (2016) found that organisational culture positively affects financial measures, namely, earnings growth, Return on Assets (ROA), cash flow and stock return. This could be corroborated by the assumption that an innovation conducive culture has the potential to shift the South African SOEs from their dire to a positive and profitable state.

7.4. Limitations and suggestions for future research

Due to the time frame granted to complete this study, the theory of organisational culture measurement applied in this study comprised the twelve-item (Krauss & Vanhove, 2022; Cooke & Szumal, 2013) summarised version of a 120 items instrument used to measure the three cultural styles. As this is a comprehensive culture diagnostic approach, thus, it might not have captured all aspects of the theoretical model this study focused on. Therefore, a comprehensive longitudinal study focusing on a larger sample size would be required, considering the larger magnitude of the South African SOEs' employment (Chen et al., 2018)

The organisational culture domain is expanding due to the changes in the occupations and how organisations are run, which is complex and technical. In addition, with Information, Communication, and Technology (ICT) intertwining the global network, redefining the concept and boundaries of work, and considering remote and hybrid workspaces, organisational culture will evolve into more unknown; but anticipated dimensions (Schein, 2010). Therefore, more studies to discover such dimensions are recommended for the future

The workforce employed by the South African SOEs includes a myriad of age groups, and to some extent, they influence the organisation's culture. Although, in this study, no significant difference was derived between the age groups, gender, position levels and years of employment regarding the perception of organisational culture and innovation. The study's questionnaire should have asked probing questions to elicit the differences in perceptions according to the demographics. Future research on how different generations, gender (Lekgothoane et al., 2020), and position levels in the workforce perceive organisational culture and innovation will be required.

The nature of the ownership of the SOEs somewhat influences the autonomy levels of the SOEs management, which spills over to the employees. Each government has a different way of running its SOEs. The largest IPO-listed SOEs were noted in this study which indicates that South African SOEs have the potential to become efficient and profitable. However, South African SOEs face more challenges due to political interferences (Mbo & Adjasi, 2017). Therefore, it affects organisational, operational, and innovation performance. These effects were not assessed in this study and could be added to future research topics.

7.5. Recommendations for the SOEs

7.5.1. Suggested Model

Limitless Innovation culture

As this study was on all the individuals employed by the SOEs, it aimed to investigate how they perceive culture and innovation in their organisations. The study further sought to investigate whether culture plays a role in any of the innovative changes happening in the organisation.

It is recommended that SOEs take the initiative to make innovation an all-employee responsibility and not only the employees from the innovation division. For instance, the SOE may involve employees from communications, finance, and human resources departments at the brainstorming table and allow them to share their ideas. This ideation process should be limitless; thus, it should not restrict employees to innovate only in their profession but may include them in all aspects of the organisation. An effective secondment program could be an appropriate approach to expedite this process.

Considering the new Generation Z workforce from graduating and eager to explore and learn work and share new ideas, they should join organisations with a culture that allows for idea sharing over multifaceted aspects of the organisation. Ideas that are accompanied by execution and marketing plans may be appropriate as the innovator would have thought the whole idea through to execution.

The SOE may intentionally partner with external institutions and organisations to ignite innovativeness, as this may ignite the mindset of the employees (Landoni,

2020). Have innovation competitions with external innovators and internal employees, where they showcase the idea masterpiece that could potentially create new revenue streams, aid with resource optimisation, reduce process cost or increase machine efficiency.

The results demonstrate that a constructive organisation culture influences innovation. At the same time, it is a culture that allows a free flow of information in an enabling environment that allows employees to realise self-actualising needs to be motivated to perform at their potential. Leaders need to ensure that all employees are inclined toward this culture. This stems from the (adjusted $R^2 = 2.1\%$) relationship between passive culture and innovation. This is a hierarchy culture, where employees work only on instruction and are neither encouraged to think differently nor offer suggestions that are not aligned with or part of the instruction. This could be detrimental to career development. This requires SOE leadership to include all the members in the decision-making and not be complacent. From that perspective, it is necessary to create a culture that encourages psychological safety (Baer & Frese, 2003). This would require leadership to enact this culture for the employee to start immersing themselves in it.

Shin et al. (2022) proved that the employee voice, which they describe as an expression of new ideas, fuels innovation, and innovation has contributed to the advancement of economic development and growth, and it starts with a thought that is shared as an idea, an idea that becomes a reality. A culture that can remove a fear of failure from the employees is encouraged as that could be the determinant of lagging to ideate. SOEs could create a platform for employees to brainstorm ideas, sometimes in the presence of a leader and other times excluding the leader because there is a perception that leaders' presence intimidates employees.

SOEs may reduce the power distance and ensure that employees are aware that the company is open to hearing their ideas and willing to execute lucrative and potentially profitable ideas with attached execution plans. SOEs, especially the major ones, are large organisations and power distance could be the reason for demotivating employees. The online employee engagements where leaders address employees in a large group are not enough for leaders to live a culture that could be visible to employees. Therefore, engaging in small groups frequently would aid in reducing the distance. Employees are motivated by leaders who create an effort to ensure their visibility

Incorporate a reward system that incentivises innovation and ensures the rewards are tangible (lucrative rewards, possibly a vacation, a gift, etc.) and intangibly through words of appreciation, showcasing the person's work and broadcasting this on the company news and social media, boosting their confidence as this could be motivation for other employees.

A culture may be enacted to be adopted, trickling it down to the supervisor and approaching it with targets and key performance indicators, however, without punitive consequences but with great appreciation. This would ensure culture change from the current one to a culture that stimulates and supports inclusivity and is keen to hear employees' voices of ideation. Culture may move to the lowest management level, as leadership is not only at the executive level. On the SOEs' values board, show the organisation's values in an "action" approach. This is because culture transformation is complex; however, nothing is impossible, and if the mindset is shifted, then culture would have shifted.

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Appendices

Appendix 1: Values of SOEs

South African Airways (SAA) Values

OUR VALUES

CUSTOMER FOCUSED – Striving to meet the unique needs of our customers (internal and external) by tailoring each interaction to suit their needs.

ACCOUNTABILITY – Taking responsibility for individual and team actions, decisions and results by establishing clear plans and goals and measuring our progress against them.

INTEGRITY – Practicing highest standards of ethical behaviour in all our work and maintaining credibility by ensuring our actions match our words.

SAFETY – Living our safety philosophy by striving for zero safety incidents through proper training, work practice, risk management and adherence to safety regulations at all times.

EXCELLENCE IN PERFORMANCE – Setting goals beyond the best, reinforcing high quality performance standards and achieving excellence by implementing best practices.

VALUING OUR PEOPLE – Committing to their satisfaction, development, and well-being, by treating them with respect, dignity and fairness.

(DPE, n.d.)

South African Express Airways Values

MISSION, VISION, VALUES

- We never compromise on safety no matter what
- Our customers are our most important investors
- We deliver with speed, without compromising on quality
- We partner with people across all operations
- We strive for continuous improvement
- We keep it simple

(DPE, n.d.)

ESKOM Values

VALUES

ZERO HARM – Eskom will strive to ensure that zero harm befalls its employees, contractor, the public and the natural environment.

INTEGRITY – Honesty of purpose, conduct and discipline in actions, and respect for people.

INNOVATION – Value-adding creativity and results orientated. Lead through excellence and innovation.

SINOBUNTU – Caring.

CUSTOMER SATISFACTION – A commitment to meet and strive to exceed the needs of the receivers of products and services.

EXCELLENCE – Acknowledged by all for exceptional standards, performance and professionalism.

(DPE, n.d.)

OUR VALUES

PERFORMANCE – We embrace operational excellence.

INTEGRITY – We are honest, truthful and ethical.

INNOVATION – We create sustainable innovative solutions.

CARING – We care for our people, customers, communities, nations and the environment.

ACCOUNTABILITY – We take responsibility for our actions.

(DPE, n.d.)

ALEXKOR Values

CORE VALUES

Alexkor subscribes to five key values. Each value is described as follows:

INTEGRITY – We will always deliver on our promise

PROFESSIONALISM – We will always strive for the highest possible standards.

ACCOUNTABILITY – We will always take full responsibility for the outcomes of our behaviour.

DEDICATION – We will be focused, goal oriented and not sidetracked

DYNAMIC – We will be highly energetic, creative and innovative

(DPE, n.d.)

SAFCOL Values

CORE VALUES

- We are passionate about forests and communities
- We respect and value our employees and customers
- We conduct ourselves with honesty and integrity
- We strive for excellence and innovation in our business

(DPE, n.d.)

Telkom values

External service promise

Customer First – Our job is to help you create the future you desire. Through simple, intuitive and responsive service, we aim to connect you to your life, your business, your world, and opportunity

Understanding your needs – Only by truly understanding your needs and circumstances can we deliver what you need to thrive. We listen, understand, then act to deliver enabling experiences

We never stop working to get it right – Whether it is our service or our products, we take ownership and strive to get it right for you – in one click, one call, one visit

Internal customer service commitment

We exist to serve the customer – Our job is to enable people with connectivity, empowering them to live more richly. Even if we don't serve customers directly, we work to enable the person who does. Through simple, intuitive, responsive service, we aim to change their world

Interaction is opportunity – We are always seeking new ways to connect with, share with and discover more about our customers – so that we can deliver the right solutions to make their worlds easier, simpler and better

We are relentless in getting it right – It is our responsibility to provide our customers with fit for purpose solutions and processes that work. We strive for zero defect, zero faults and zero downtime. We never stop working to get it right – in one click, one call, one visit

DBSA Values

OUR VALUES

Shared vision: We share and keep the sustainability, strategic intent and mandate of the DBSA top of mind in all our decisions and actions

Service orientation: We deliver responsive and quality service that speaks to the need of our clients and continuously build relationships that result in win-win outcomes

Integrity: Our deals, interactions and conduct are proof of transparent and ethical behaviour that shows respect and care for all our people (employees, stakeholders, the Shareholder, clients and communities)

High performance: We are enabled, empowered and inspired to deliver consistent quality, effective and efficient results for which we are accountable and rewarded

Innovation: We challenge ourselves continuously to improve what we do, how we do it and how well we work together

Appendix 2: Comparison of SOE and POE

Online Annex Figure 3.1.4. Comparison of State-Owned and Private Enterprises

(Percent (LHS); Percent in deviation)

SOEs are less efficient than private firms in profitability and productivity, controlling for industries and firm characteristics.
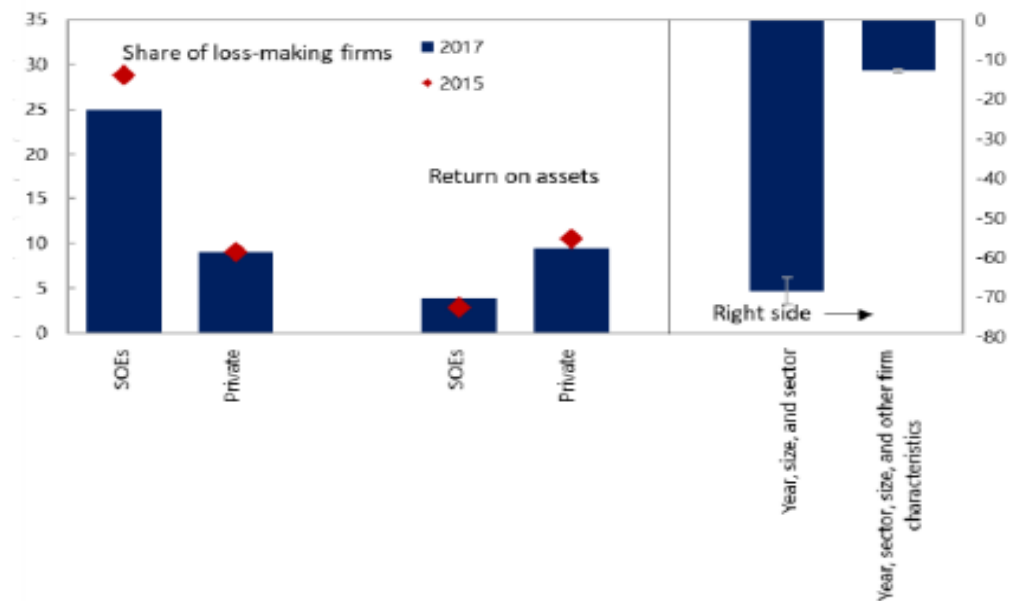
Source: Alverez, Chen, and Li (forthcoming).
Note: Dots indicate data for 2015 and bars indicate data for 2017. The bars on the right indicate estimated coefficients of productivity differentials and the intervals show one standard deviation of the panel regression results.

Appendix 3: Organisational Culture and Innovation Questions

			1	2	3	4	5
		Level of employment: junior position, supervisor, line manager, middle manager, senior manager:					
		Job function:					
		Total number of years in current organisation:					
		Gender:					
		Age:					
		Instructions					
		This questionnaire has 45 Qustions and will take approximately 30 minutes to complete.					
		Please take your time and answer truthfully.					
		Please rate your level of agreement of the following statements.					
		Please choose 1/5 these levels of agreement (1=Strongly disagree, 2=Disagree, 3=Uncertain, 4=Agree, 5=Strongly agree).					

RESEARCH QUESTIONNAIRE

Question	Organisational culture		1	2	3	4	5
			Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
	Passive culture						
1	Approval norms	I am expected to agree with, gain approval of, and be liked by others.					
2	Conventional norms	I am expected to conform, follow the rule, and make a good impression.					
3	Defendant norms	I am expected to do what I am told and clear all decisions with superiors.					
4	Avoidance norms	I am expected to shift responsibilities to others and avoid any possibility of being blamed for problem.					
	Aggressive culture		Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
5	Oppositional norms	I am expected to be critical, oppose ideas of, and make safe (but ineffectual) decisions.					
6	Power norms	I am expected to take charge, control subordinates, and yeild to the demands of superiors.					
7	Competitive norms	I am expected to operate in a "win-lose" framework, outperform others, and work against (rather than with) my peers.					
8	perfectionistic norms	I am expected to appear competent, keep track of everything, and work long hours to attain narrowly-defined objectives.					
	Constructive culture		Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
9	Achievement norms	I am expcted to set challenging but relistic goals, establish plans to reach those goals and pursue them with enthusiasm.					
10	Self-Actulising norms	I am expected to enjoy my work, develop myself, and take on new and interesting tasks.					
11	Humanistic-Encouraging norms	I am expected to be surpportive, constructive, and open to influence in my dealings with others					
12	Affiliative norms	I am expected to be friendly, coorporative, and sensitive to the satisfaction of my work gropu.					
	Innovation Strategy						
	Exploitative Innovation Strategy		Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
13	Eploit 1	Products and /or process sre analyse to search for improvements					
14	Eploit 2	Your business unit seeks to improve processes to reduce costs					
15	Eploit 3	Your business unit seeks to reduce costs to the customer through process improvements					
16	Eploit 4	Your business unit seeks to improve processes to reduce time taken for unit production					
17	Eploit 5	Your business unit aims to add value to its products and/or services through process improvements					
	Eplorative Innovation Strategy		Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
19	Explore 1	Your business unit follows other companies' ideas within the same industry.					
20	Explore 2	A 'pioneering' strategy is pursued by your business unit.					
21	Explore 3	Product innovation is 'offensive' (as opposed to 'defensive').					
22	Explore 4	Your products offer unique features not available from competitors' offerings.					
23	Explore 5	Your products are highly innovative.					
	Employee Innovation		Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
24	1	Creativity is encouraged here.					
25	2	Our ability to function creatively is respected by leadership.					
26	3	Around here, people are allowed to solve the same problems in different ways.					
27	4	The main function of members in this organisation is to follow orders which come down through channels.					
28	5	Around here, a person can get in a lot of trouble by being different.					
29	6	This organisation can be dicribed as flexible and contually adapting to change.					
30	7	A person cannot do things that are too different around without provoking anger.					
31	8	The best way to get along in this organisation is to think the way the rest of the group does.					
32	9	people around here are expected to deal with problems in the same way.					
33	10	This organisation is open and responsive to change.					
34	11	The people in charge around here usualy get credit for others' ideas.					
35	12	In this organisation, we tend to stick to tried and true ways.					
36	13	This place seems to to be more concerned with the status quo than with change.					
37	14	Assistance in developing new ideas is readily available.					
38	15	There are adquate resources devoted to innovation in this organisation.					
39	16	There is adequate time available to pursue creative ideas here.					
40	17	Lack of funding to investigate creative ideas is a problem in this organisation.					
41	18	Personal shortages inhibit innovation in this organisation.					
42	19	This organisation gives me free time to pursue innovative ideas during the work day.					
43	20	The reward system here encourages innovation.					
44	21	The organisation publicly recognises those who are innovative.					
45	22	The reward system here benefits mainly those who don't rock the boat.					

Appendix 4: Ethical Clearance

Gordon Institute of Business Science
University of Pretoria

Ethical Clearance Approved

Dear Neo Mokori,

Please be advised that your application for Ethical Clearance has been approved.
You are therefore allowed to continue collecting your data.
We wish you everything of the best for the rest of the project.

Ethical Clearance Form

Kind Regards

This email has been sent from an unmonitored email account. If you have any comments or concerns, please contact the GIBS Research Admin team.

Coded research instrument

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PassiveOC_Approval norms	170	4	1	5	3.02	1.328	1.763	-0.212	0.186	-1.103	0.37
PassiveOC_Conventional norms	170	4	1	5	4.18	0.946	0.896	-1.221	0.186	1.263	0.37
PassiveOC_Defendant norms	170	4	1	5	3.78	1.18	1.394	-0.736	0.186	-0.351	0.37
PassiveOC_Avoidance norms	170	4	1	5	1.7	1.043	1.087	1.643	0.186	2.133	0.37
AggressiveOC_Oppositional norms	170	4	1	5	2.44	1.354	1.834	0.502	0.186	-0.992	0.37
AggressiveOC_Power norms	170	4	1	5	3.17	1.287	1.657	-0.273	0.186	-0.906	0.37
AggressiveOC_Competitive norms	170	4	1	5	2.04	1.221	1.49	0.959	0.186	-0.223	0.37
AggressiveOC_Perfectionistic norms	170	4	1	5	3.32	1.361	1.853	-0.234	0.186	-1.219	0.37
ConstructiveOC_Achievement norms	170	4	1	5	4.05	1.081	1.169	-1.145	0.186	0.663	0.37
ConstructiveOC_Self-Actulising norms	170	4	1	5	3.81	1.218	1.483	-0.755	0.186	-0.48	0.37
ConstructiveOC_Humanistic-Encouraging norms	170	4	1	5	4.21	0.935	0.875	-1.258	0.186	1.424	0.37
ConstructiveOC_Affiliative norms	170	4	1	5	4.22	0.848	0.719	-1.035	0.186	0.876	0.37
Eploit1_AnalysProductForImprovmt	170	4	1	5	3.64	1.184	1.403	-0.72	0.186	-0.244	0.37
Eploit2_ImprovProcessToReduceCost	170	4	1	5	3.87	1.159	1.344	-1.012	0.186	0.403	0.37
Eploit3_ImprovToReduceCustCost	170	4	1	5	3.63	1.181	1.394	-0.554	0.186	-0.469	0.37
Eploit4_ImprovProcesReduceUnitProdTime	170	4	1	5	3.8	1.175	1.38	-0.823	0.186	-0.138	0.37
Eploit5_AddValThruProcesImprovmt	170	4	1	5	3.99	1.099	1.207	-1.006	0.186	0.285	0.37
Explore1_FollowIndustrIdeas	170	4	1	5	3.09	1.145	1.312	-0.175	0.186	-0.531	0.37
Explore2_PursueHihgInnovativApproach	170	4	1	5	3.46	1.315	1.729	-0.376	0.186	-1.017	0.37
Explore3_DefensivOffensivProducInnovation	170	4	1	5	2.81	1.223	1.495	0.063	0.186	-0.813	0.37
Explore4_UniqueProdctFeatures	170	4	1	5	3.48	1.227	1.506	-0.406	0.186	-0.708	0.37
Explore5_HighlyInnovativProducts	170	4	1	5	3.26	1.223	1.495	-0.115	0.186	-0.996	0.37
Employee_CreativeWorkEnvironment	170	4	1	5	3.45	1.231	1.516	-0.42	0.186	-0.711	0.37
Employee_LeadershipValuesSupportInnovation	170	4	1	5	3.35	1.238	1.532	-0.283	0.186	-0.936	0.37
Employee_VariousWaysToSolveSameProblem	170	4	1	5	3.51	1.208	1.459	-0.381	0.186	-0.854	0.37
Employee_ExecuteTopDownInstruction	170	4	1	5	3.62	1.216	1.479	-0.562	0.186	-0.643	0.37
Employee_DifferentThinkerGetsInTrouble	170	4	1	5	2.79	1.426	2.034	0.183	0.186	-1.258	0.37
Employee_FlexibleAdaptiveFirm	170	4	1	5	3.17	1.31	1.716	-0.065	0.186	-1.113	0.37
Employee_BeingDefferentProvokesAnger	170	4	1	5	2.76	1.377	1.897	0.212	0.186	-1.135	0.37
Employee_ThinkAlikeToBeLiked	170	4	1	5	2.94	1.353	1.831	0.05	0.186	-1.173	0.37
Employee_SolveProblemsSimilarly	170	4	1	5	2.78	1.312	1.722	0.187	0.186	-1.09	0.37
Employee_OpenResponsiveToChange	170	4	1	5	3.21	1.265	1.6	-0.176	0.186	-0.977	0.37
Employee_LeadersGetCreditForOthersIdeas	170	4	1	5	3.29	1.317	1.735	-0.244	0.186	-1.002	0.37
Employee_StickToTriedTestedTrueWays	170	4	1	5	3.53	0.986	0.973	-0.101	0.186	-0.534	0.37
Employee_FocusedOnStatusQuoNotNewIdeas	170	4	1	5	3.01	1.296	1.68	0.011	0.186	-1.031	0.37
Employee_AvailableHelpToDevelopNewIdeas	170	4	1	5	3.04	1.216	1.478	0.112	0.186	-0.923	0.37
Employee_EnoughResourceForInnovation	170	4	1	5	2.97	1.298	1.686	0.121	0.186	-1.033	0.37
Employee_InadequateFundsForInnovation	170	4	1	5	3.25	1.3	1.69	-0.126	0.186	-1.027	0.37
Employee_InadequateStaffDiscourageInnovation	170	4	1	5	3.37	1.3	1.69	-0.129	0.186	-1.105	0.37
Employee_EnoughDayTimeToExploreInnovation	170	4	1	5	2.55	1.315	1.728	0.398	0.186	-0.937	0.37
Employee_RewardsStimulateInnovation	170	4	1	5	2.46	1.389	1.931	0.422	0.186	-1.118	0.37
Employee_RewardingInnovationAccordingly	170	4	1	5	2.84	1.318	1.736	0.073	0.186	-1.117	0.37
Employee_RewardingThoseComplyingWithStatusQuo	170	4	1	5	3.04	1.316	1.732	-0.045	0.186	-0.984	0.37
Valid N (Listwise)	170										

Coded demographics

Question	Code	Label
Age		
	1	18 - 43 years old
	2	34 - 44 years old
	3	45 - 55 years old
	4	56 - 65 years old
Gender		
	1	Male
	2	Female
	3	Other
	4	Prefer not to say
Position Level		
	1	Junior professional
	2	Supervisor
	3	Specialist
	4	Junior management
	5	Middle management
	6	Senior management
	7	Executive management
Number of years employed by organisation		
	1	1 - 4 years
	2	5 - 10 years
	3	11 - 15 years
	4	16 - 20 years
	5	20+ years

Appendix 6: Variables' descriptive statistics

Descriptive Statistics										
	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PassiveOC	170	1.33	5	3.6608	0.85078	0.724	-0.427	0.186	-0.215	0.37
AggressiveOC	170	1.00	5	2.7426	0.88938	0.791	0.21	0.186	-0.256	0.37
ConstructiveOC	170	1.25	5	4.0706	0.77984	0.608	-0.934	0.186	0.91	0.37
OrganCulture	170	2.03	5	3.4913	0.53196	0.283	0.245	0.186	0.6	0.37
OrganInnovation	170	1.69	5	3.3004	0.65241	0.426	-0.018	0.186	0.248	0.37
Valid N (listwise)	170									

Appendix 7: Tests of reliability

PassiveOC: Initial Cronbach's Alpha

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.555	0.552	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PassiveOC1	9.66	4.427	0.467	0.238	0.356
PassiveOC2	8.5	6.086	0.389	0.197	0.454
PassiveOC3	8.91	5.707	0.301	0.12	0.516
PassiveOC4	10.98	6.514	0.225	0.094	0.567

PassiveOC: Final Cronbach's Alpha

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.567	0.582	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PassiveOC1	7.96	2.986	0.385	0.167	0.467
PassiveOC2	6.8	3.96	0.441	0.196	0.406
PassiveOC3	7.21	3.62	0.334	0.119	0.531

AggressiveOC: Initial Cronbach's Alpha

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.613	0.616	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
AggressiveOC1	8.529	8.038	0.363	0.204	0.567
AggressiveOC2	7.800	8.338	0.358	0.151	0.569
AggressiveOC3	8.935	7.931	0.471	0.265	0.489
AggressiveOC4	7.647	7.839	0.389	0.201	0.547

ConstructiveOC: Initial Cronbach's Alpha

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.752	0.763	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
ConstructiveOC1	12.235	6.347	0.406	0.167	0.773
ConstructiveOC2	12.476	4.996	0.597	0.414	0.671
ConstructiveOC3	12.076	5.740	0.695	0.523	0.619
ConstructiveOC4	12.059	6.624	0.547	0.355	0.701

Innovation strategy: Initial Cronbach's Alpha

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.870	0.872	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
InnovStrat1	31.38	52.368	0.694	0.545	0.849
InnovStrat2	31.15	52.793	0.684	0.639	0.850
InnovStrat3	31.39	51.009	0.786	0.683	0.841
InnovStrat4	31.22	52.435	0.697	0.678	0.849
InnovStrat5	31.04	52.389	0.759	0.663	0.845
InnovStrat6	31.94	56.096	0.481	0.343	0.865
InnovStrat7	31.56	50.993	0.689	0.529	0.848
InnovStrat8	32.22	58.917	0.280	0.176	0.881
InnovStrat9	31.54	58.273	0.314	0.274	0.879
InnovStrat10	31.76	54.335	0.546	0.458	0.861

Employee innovation: Initial Cronbach's Alpha

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.751	0.752	21

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
EmplyeeInnov1	61.50	113.861	0.268	0.603	0.745
EmplyeeInnov2	61.60	113.886	0.265	0.747	0.745
EmplyeeInnov3	61.45	114.308	0.257	0.659	0.745
EmplyeeInnov4	61.33	112.068	0.344	0.327	0.739
EmplyeeInnov5	62.16	109.708	0.357	0.707	0.738
EmplyeeInnov6	61.78	110.656	0.364	0.701	0.738
EmplyeeInnov7	62.19	111.976	0.293	0.628	0.743
EmplyeeInnov8	62.01	112.852	0.269	0.691	0.745
EmplyeeInnov9	62.17	112.699	0.287	0.719	0.743
EmplyeeInnov10	61.74	113.021	0.290	0.587	0.743
EmplyeeInnov11	61.66	112.841	0.280	0.504	0.744
EmplyeeInnov12	61.42	114.376	0.335	0.392	0.741
EmplyeeInnov13	61.94	114.612	0.220	0.647	0.748
EmplyeeInnov14	61.92	112.088	0.344	0.621	0.739
EmplyeeInnov15	61.98	110.148	0.388	0.593	0.736
EmplyeeInnov16	61.71	112.990	0.280	0.421	0.744
EmplyeeInnov17	61.58	112.919	0.282	0.441	0.744
EmplyeeInnov18	62.40	110.135	0.382	0.500	0.736
EmplyeeInnov19	62.49	112.358	0.276	0.580	0.744
EmplyeeInnov20	62.12	109.596	0.402	0.609	0.735
EmplyeeInnov21	61.91	113.572	0.253	0.612	0.746

Appendix 8: Pearson correlation tests of validity

Indicator validity: PassiveOC, AggressiveOC and ConstructiveOC

Correlations: AggressiveOC		AOC1	AOC2	AOC3	AOC4
AOC1	Pearson Correlation	1	.221**	.431**	.160*
	Sig. (2-tailed)		0.004	<.001	0.038
	N	170	170	170	170
AOC2	Pearson Correlation	.221**	1	.211**	.350**
	Sig. (2-tailed)	0.004		0.006	<.001
	N	170	170	170	170
AOC3	Pearson Correlation	.431**	.211**	1	.346**
	Sig. (2-tailed)	<.001	0.006		<.001
	N	170	170	170	170
AOC4	Pearson Correlation	.160*	.350**	.346**	1
	Sig. (2-tailed)	0.038	<.001	<.001	
	N	170	170	170	170
** Correlation is significant at the 0.01 level (2-tailed).					
* Correlation is significant at the 0.05 level (2-tailed).					

Correlations: ConstructiveOC		COC1	COC2	COC3	COC4
COC1	Pearson Correlation	1	.344**	.377**	.298**
	Sig. (2-tailed)		<.001	<.001	<.001
	N	170	170	170	170
COC2	Pearson Correlation	.344**	1	.628**	.443**
	Sig. (2-tailed)	<.001		<.001	<.001
	N	170	170	170	170
COC3	Pearson Correlation	.377**	.628**	1	.583**
	Sig. (2-tailed)	<.001	<.001		<.001
	N	170	170	170	170
COC4	Pearson Correlation	.298**	.443**	.583**	1
	Sig. (2-tailed)	<.001	<.001	<.001	
	N	170	170	170	170
** Correlation is significant at the 0.01 level (2-tailed).					

Correlations: PassiveOC		POC1	POC2	POC3
POC1	Pearson Correlation	1	.383	.256
	Sig. (2-tailed)		3E-07	7E-04
	N	170	170	170
POC2	Pearson Correlation	.383	1	.312
	Sig. (2-tailed)	3E-07		3E-05
	N	170	170	170
POC3	Pearson Correlation	.256	.312	1
	Sig. (2-tailed)	7E-04	3E-05	
	N	170	170	170
**. Correlation is significant at the 0.01 level (2-tailed).				

Indicator validity: Innovation strategy

Correlations: Innovation Strategy		IS1	IS2	IS3	IS4	IS5	IS6	IS7	IS8	IS9	IS10
IS1	Pearson Correlation	1	.569**	.594**	.624**	.638**	.338**	.574**	0.148	.270**	.469**
	Sig. (2-tailed)		<.001	<.001	<.001	<.001	<.001	<.001	0.055	<.001	<.001
	N	170	170	170	170	170	170	170	170	170	170
IS2	Pearson Correlation	.569**	1	.695**	.750**	.649**	.450**	.443**	0.128	.161*	.354**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001	<.001	<.001	0.095	0.036	<.001
	N	170	170	170	170	170	170	170	170	170	170
IS3	Pearson Correlation	.594**	.695**	1	.701**	.736**	.497**	.564**	.294**	.238**	.419**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001	<.001	<.001	<.001	0.002	<.001
	N	170	170	170	170	170	170	170	170	170	170
IS4	Pearson Correlation	.624**	.750**	.701**	1	.691**	.453**	.473**	0.129	.162*	.288**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001	<.001	<.001	0.093	0.035	<.001
	N	170	170	170	170	170	170	170	170	170	170
IS5	Pearson Correlation	.638**	.649**	.736**	.691**	1	.429**	.614**	.183*	.246**	.394**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001		<.001	<.001	0.017	0.001	<.001
	N	170	170	170	170	170	170	170	170	170	170
IS6	Pearson Correlation	.338**	.450**	.497**	.453**	.429**	1	.389**	.304**	-0.001	.174*
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001		<.001	<.001	0.99	0.023
	N	170	170	170	170	170	170	170	170	170	170
IS7	Pearson Correlation	.574**	.443**	.564**	.473**	.614**	.389**	1	.284**	.317**	.533**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001		<.001	<.001	<.001
	N	170	170	170	170	170	170	170	170	170	170
IS8	Pearson Correlation	0.148	0.128	.294**	0.129	.183*	.304**	.284**	1	0.102	.228**
	Sig. (2-tailed)	0.055	0.095	<.001	0.093	0.017	<.001	<.001		0.185	0.003
	N	170	170	170	170	170	170	170	170	170	170
IS9	Pearson Correlation	.270**	.161*	.238**	.162*	.246**	-0.001	.317**	0.102	1	.500**
	Sig. (2-tailed)	<.001	0.036	0.002	0.035	0.001	0.99	<.001	0.185		<.001
	N	170	170	170	170	170	170	170	170	170	170
IS10	Pearson Correlation	.469**	.354**	.419**	.288**	.394**	.174*	.533**	.228**	.500**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	0.023	<.001	0.003	<.001	
	N	170	170	170	170	170	170	170	170	170	170
** Correlation is significant at the 0.01 level (2-tailed).											
* Correlation is significant at the 0.05 level (2-tailed).											

Indicator validity: Employee innovation

		EI1	EI2	EI3	EI4	EI5	EI6	EI7	EI8	EI9	EI10	EI11	EI12	EI13	EI14	EI15	EI16	EI17	EI18	EI19	EI20	EI21
										Correlations: Employee Innovation												
EI1	Pearson Correlation	1	.733**	.597**	-0.083	-.327**	.620**	-.244**	-.339**	-.378**	.527**	-.159*	-0.057	-.348**	.539**	.408**	-0.118	-0.028	.462**	.402**	.455**	-.329**
	Sig. (2-tailed)		<.001	<.001	0.282	<.001	<.001	0.001	<.001	<.001	<.001	0.038	0.458	<.001	<.001	<.001	0.124	0.718	<.001	<.001	<.001	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI2	Pearson Correlation	.733**	1	.751**	-.190*	-.388**	.696**	-.312**	-.426**	-.433**	.557**	-.278**	-0.135	-.394**	.637**	.507**	-0.121	-0.108	.520**	.520**	.544**	-.372**
	Sig. (2-tailed)	<.001		<.001	0.013	<.001	<.001	<.001	<.001	<.001	<.001	<.001	0.08	<.001	<.001	<.001	0.117	0.163	<.001	<.001	<.001	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI3	Pearson Correlation	.597**	.751**	1	-0.131	-.324**	.622**	-.259**	-.387**	-.416**	.522**	-.265**	-0.122	-.359**	.568**	.519**	-0.095	-.226**	.501**	.497**	.544**	-.318**
	Sig. (2-tailed)	<.001	<.001		0.088	<.001	<.001	<.001	<.001	<.001	<.001	<.001	0.113	<.001	<.001	<.001	0.217	0.003	<.001	<.001	<.001	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI4	Pearson Correlation	-0.083	-.190*	-0.131	1	.453**	-0.086	.297**	.386**	.390**	-0.036	.324**	.315**	.326**	-0.059	0.113	.175*	.171*	0.031	-0.046	0.064	.354**
	Sig. (2-tailed)	0.282	0.013	0.088		<.001	0.266	<.001	<.001	<.001	0.638	<.001	<.001	<.001	0.445	0.143	0.022	0.026	0.688	0.548	0.404	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI5	Pearson Correlation	-.327**	-.388**	-.324**	.453**	1	-.241**	.722**	.662**	.656**	-.261**	.511**	.301**	.603**	-.262**	-.163*	.436**	.360**	-.160*	-.247**	-0.144	.641**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001		0.002	<.001	<.001	<.001	<.001	<.001	<.001	<.001	0.034	<.001	<.001	<.001	0.037	0.001	0.061	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI6	Pearson Correlation	.620**	.696**	.622**	-0.086	-.241**	1	-.289**	-.351**	-.298**	.657**	-.197**	-0.148	-.357**	.617**	.580**	-0.067	-0.003	.581**	.496**	.599**	-.340**
	Sig. (2-tailed)	<.001	<.001	<.001	0.266	0.002		<.001	<.001	<.001	<.001	0.01	0.054	<.001	<.001	<.001	0.388	0.973	<.001	<.001	<.001	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI7	Pearson Correlation	-.244**	-.312**	-.259**	.297**	.722**	-.289**	1	.558**	.531**	-.270**	.485**	.271**	.582**	-.260**	-.302**	.446**	.333**	-0.14	-.215**	-.204**	.580**
	Sig. (2-tailed)	0.001	<.001	<.001	<.001	<.001	<.001		<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	0.068	0.005	0.008	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI8	Pearson Correlation	-.339**	-.426**	-.387**	.386**	.662**	-.351**	.558**	1	.783**	-.349**	.528**	.360**	.628**	-.297**	-.190*	.358**	.302**	-.181*	-.256**	-.238**	.573**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001		<.001	<.001	<.001	<.001	<.001	<.001	0.013	<.001	<.001	0.018	<.001	0.002	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI9	Pearson Correlation	-.378**	-.433**	-.416**	.390**	.656**	-.298**	.531**	.783**	1	-.297**	.469**	.451**	.649**	-.288**	-0.15	.330**	.277**	-.187*	-.233**	-.185*	.595**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001		<.001	<.001	<.001	<.001	<.001	0.051	<.001	<.001	0.015	0.002	0.016	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI10	Pearson Correlation	.527**	.557**	.522**	-0.036	-.261**	.657**	-.270**	-.349**	-.297**	1	-.233**	0.014	-.399**	.599**	.544**	.216**	-0.041	.449**	.503**	.543**	-.300**
	Sig. (2-tailed)	<.001	<.001	<.001	0.638	<.001	<.001	<.001	<.001	<.001		0.002	0.857	<.001	<.001	<.001	0.005	0.597	<.001	<.001	<.001	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI11	Pearson Correlation	-.159*	-.278**	-.265**	.324**	.511**	-.197**	.485**	.528**	.469**	-.233**	1	.339**	.590**	-.269**	-.206**	.265**	.433**	-0.146	-.256**	-.228**	.532**
	Sig. (2-tailed)	0.038	<.001	<.001	<.001	<.001	0.01	<.001	<.001	<.001	0.002		<.001	<.001	0.007	<.001	<.001	<.001	0.058	<.001	0.003	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI12	Pearson Correlation	-0.057	-0.135	-0.122	.315**	.301**	-0.148	.271**	.360**	.451**	0.014	.339**	1	.421**	0.014	0.021	.197**	.294**	-0.104	-0.055	0.022	.293**
	Sig. (2-tailed)	0.458	0.08	0.113	<.001	<.001	0.054	<.001	<.001	<.001	0.857	<.001		<.001	0.857	0.781	0.01	<.001	0.177	0.473	0.776	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI13	Pearson Correlation	-.348**	-.394**	-.359**	.326**	.603**	-.357**	.582**	.628**	.649**	-.399**	.590**	.421**	1	-.361**	-.256**	.318**	.268**	-.237**	-.305**	-.293**	.655**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001		<.001	<.001	<.001	<.001	0.002	<.001	<.001	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI14	Pearson Correlation	.539**	.637**	.568**	-0.059	-.262**	.617**	-.260**	-.297**	-.288**	.599**	-.269**	0.014	-.361**	1	.623**	-0.08	-0.102	.513**	.579**	.584**	-.374**
	Sig. (2-tailed)	<.001	<.001	<.001	0.445	<.001	<.001	<.001	<.001	<.001	<.001	<.001	0.857	<.001		<.001	0.297	0.186	<.001	<.001	<.001	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI15	Pearson Correlation	.408**	.507**	.519**	0.113	-.163*	.580**	-.302**	-.190*	-0.15	.544**	-.206**	0.021	-.256**	.623**	1	-0.083	0.003	.523**	.477**	.589**	-.276**
	Sig. (2-tailed)	<.001	<.001	<.001	0.143	0.034	<.001	<.001	0.013	0.051	<.001	0.007	0.781	<.001	<.001		0.28	0.969	<.001	<.001	<.001	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI16	Pearson Correlation	-0.118	-0.121	-0.095	.175*	.436**	-0.067	.446**	.358**	.330**	.216**	.265**	.197**	.318**	-0.08	-0.083	1	.453**	-0.063	-.224**	-0.104	.433**
	Sig. (2-tailed)	0.124	0.117	0.217	0.022	<.001	0.388	<.001	<.001	<.001	0.005	<.001	0.01	<.001	0.297	0.28		<.001	0.414	0.003	0.177	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI17	Pearson Correlation	-0.028	-0.108	-.226**	.171*	.360**	-0.003	.333**	.302**	.277**	-0.041	.433**	.294**	.268**	-0.102	0.003	.453**	1	-0.107	-.214**	-0.109	.340**
	Sig. (2-tailed)	0.718	0.163	0.003	0.026	<.001	0.973	<.001	<.001	<.001	0.597	<.001	<.001	<.001	0.186	0.969	<.001		0.166	0.005	0.156	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI18	Pearson Correlation	.462**	.520**	.501**	0.031	-.160*	.581**	-0.067	-.181*	-.187*	.449**	-0.146	-0.104	-.237**	.513**	.523**	-0.063	-0.107	1	.571**	.538**	-.184*
	Sig. (2-tailed)	<.001	<.001	<.001	0.688	0.037	<.001	0.068	0.018	0.015	<.001	0.058	0.177	0.002	<.001	<.001	0.414	0.166		<.001	<.001	0.016
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI19	Pearson Correlation	.402**	.520**	.497**	-0.046	-.247**	.496**	-.215**	-.256**	-.233**	.503**	-.256**	-0.055	-.305**	.579**	.477**	-.224**	-.214**	.571**	1	.666**	-.256**
	Sig. (2-tailed)	<.001	<.001	<.001	0.548	0.001	<.001	0.005	<.001	0.002	<.001	<.001	0.473	<.001	<.001	<.001	0.003	0.005	<.001		<.001	<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI20	Pearson Correlation	.455**	.544**	.544**	0.064	-0.144	.599**	-.204**	-.238**	-.185*	.543**	-.228**	0.022	-.293**	.584**	.589**	-0.104	-0.109	.538**	.666**	1	-.269**
	Sig. (2-tailed)	<.001	<.001	<.001	0.404	0.061	<.001	0.008	0.002	0.016	<.001	0.003	0.776	<.001	<.001	<.001	0.177	0.156	<.001	<.001		<.001
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
EI21	Pearson Correlation	-.329**	-.372**	-.318**	.354**	.641**	-.340**	.580**	.573**	.595**	-.300**	.532**	.293**	.655**	-.374**	-.276**	.433**	.340**	-.184*	-.256**	-.269**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	0.016	<.001	<.001	
	N	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Appendix 9: Exploratory Factor Analysis (EFA)

PassiveOC total variance explained

Total Variance Explained (PassiveOC)						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Approval norms	1.637	54.567	54.567	1.637	54.567	54.567
Conventional norms	0.754	25.142	79.709			
Defendant norms	0.609	20.291	100			

PassiveOC component matrix

Component Matrixa (PassiveOC)	
	Component
	1
Approval norms	0.746
Conventional norms	0.783
Defendant norms	0.684
Extraction Method: Principal Component Analysis.	
a 1 components extracted.	

AggressiveOC total variance explained

Total Variance Explained (AggressiveOC)						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Oppositional norms	1.864	46.608	46.608	1.864	46.608	46.608
Power norms	0.932	23.289	69.897			
Competitive norms	0.712	17.807	87.705			
perfectionistic norms	0.492	12.295	100			

AggressiveOC component matrix

Component Matrixa (AggreseiveOC)	
	Component
	1
Oppositional norms	0.663
Power norms	0.628
Competitive norms	0.755
perfectionistic norms	0.679
Extraction Method: Principal Component Analysis.	
a 1 components extracted.	

ConstructiveOC total variance explained

Total Variance Explained (ConstructiveOC)						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Achievement norms	2.362	59.054	59.054	2.362	59.054	59.054
Self-Actulising norms	0.748	18.708	77.761			
Humanistic-Encouraging norms	0.556	13.894	91.656			
Affiliative norms	0.334	8.344	100			

ConstructiveOC Component matrix

Component Matrixa (ConstructiveOC)	Component 1
Achievement norms	0.611
Self-Actulising norms	0.804
Humanistic-Encouraging norms	0.868
Affiliative norms	0.767
Extraction Method: Principal Component Analysis.	
a 1 components extracted.	

Innovation strategy total variance explained

Total Variance Explained (InnovStrat)									
Component	Initial Eigenvalues			Extraction Sums of Squared			Rotation Sums of Squared		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Eploit1_AnalysProductForImprovmt	4.911	49.108	49.108	4.911	49.108	49.108	4.048	40.479	40.479
Eploit2_ImprovProcessToReduceCost	1.327	13.269	62.377	1.327	13.269	62.377	1.896	18.958	59.436
Eploit3_ImprovToReduceCustCost	1.052	10.521	72.898	1.052	10.521	72.898	1.346	13.462	72.898
Eploit4_ImprovProcesReduceUnitProdTime	0.566	5.661	78.56						
Eploit5_AddValThruProcesImprovmt	0.547	5.467	84.026						
Explore1_FollowIndustrIdeas	0.444	4.436	88.462						
Explore2_PursueHihgInnovativApproach	0.389	3.891	92.353						
Explore3_DefensivOffensivProducInnovation	0.301	3.012	95.365						
Explore4_UniqueProdctFeatures	0.235	2.354	97.719						
Explore5_HighlyInnovativProducts	0.228	2.281	100						

Innovation strategy component mix

Component Matrixa (InnovStrat)	Component 1	2	3
Eploit1_AnalysProductForImprovmt	0.788	0.048	-0.19
Eploit2_ImprovProcessToReduceCost	0.798	-0.263	-0.195
Eploit3_ImprovToReduceCustCost	0.863	-0.135	0.02
Eploit4_ImprovProcesReduceUnitProdTime	0.813	-0.296	-0.21
Eploit5_AddValThruProcesImprovmt	0.849	-0.103	-0.125
Explore1_FollowIndustrIdeas	0.585	-0.387	0.385
Explore2_PursueHihgInnovativApproach	0.757	0.217	0.116
Explore3_DefensivOffensivProducInnovation	0.333	0.106	0.86
Explore4_UniqueProdctFeatures	0.374	0.754	-0.127
Explore5_HighlyInnovativProducts	0.601	0.602	0.024

Employee innovation total variance explained

Total Variance Explained (EmplyeeInnov)									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
CreativeWorkEnvironment	8.156	38.838	38.838	8.156	38.838	38.838	6.173	29.395	29.395
LeadershipValuesSupportInnovation	3.565	16.976	55.814	3.565	16.976	55.814	4.874	23.208	52.603
VariousWaysToSolveSameProblem	1.25	5.951	61.765	1.25	5.951	61.765	1.924	9.162	61.765
ExecuteTopDownInstruction	0.986	4.694	66.459						
DifferentThinkerGetsInTrouble	0.834	3.97	70.429						
FlexibleAdaptiveFirm	0.737	3.51	73.939						
BeingDefferentProvokesAnger	0.66	3.143	77.082						
ThinkAlikeToBeLiked	0.59	2.808	79.89						
SolveProblemsSimilarly	0.54	2.572	82.462						
OpenResponsiveToChange	0.48	2.284	84.746						
LeadersGetCreditForOthersIdeas	0.439	2.09	86.836						
StickToTriedTestedTrueWays	0.419	1.997	88.833						
FocusedOnStatusQuoNotNewIdeas	0.375	1.785	90.619						
AvailableHelpToDevelopNewIdeas	0.361	1.719	92.338						
EnoughResourceForInnovation	0.328	1.562	93.9						
InadequateFundsForInnovation	0.272	1.297	95.197						
InadequateStaffDiscourageInnovation	0.251	1.194	96.391						
EnoughDayTimeToExploreInnovation	0.221	1.052	97.443						
RewardsStimulateInnovation	0.2	0.953	98.396						
RewardingInnovationAccordingly	0.179	0.852	99.249						
RewardingThoseComplyingWithStatusQuo	0.158	0.751	100						

Employee innovation component mix

| Component Matrixa (EmplyeeInnov)			
	Component		
	1	2	3
CreativeWorkEnvironment	0.668	0.317	0.284
LeadershipValuesSupportInnovation	0.779	0.306	0.241
VariousWaysToSolveSameProblem	0.727	0.303	0.118
ExecuteTopDownInstruction	-0.315	0.485	-0.351
DifferentThinkerGetsInTrouble	-0.672	0.507	-0.040
FlexibleAdaptiveFirm	0.721	0.421	0.179
BeingDefferentProvokesAnger	-0.630	0.426	0.123
ThinkAlikeToBeLiked	-0.704	0.419	-0.171
SolveProblemsSimilarly	-0.690	0.440	-0.258
OpenResponsiveToChange	0.675	0.359	-0.018
LeadersGetCreditForOthersIdeas	-0.576	0.410	0.153
StickToTriedTestedTrueWays	-0.322	0.460	-0.151
FocusedOnStatusQuoNotNewIdeas	-0.720	0.362	-0.079
AvailableHelpToDevelopNewIdeas	0.702	0.408	-0.032
EnoughResourceForInnovation	0.595	0.473	-0.157
InadequateFundsForInnovation	-0.391	0.397	0.512
InadequateStaffDiscourageInnovation	-0.348	0.404	0.563
EnoughDayTimeToExploreInnovation	0.572	0.453	-0.107
RewardsStimulateInnovation	0.636	0.351	-0.322
RewadingInnovationAccordingly	0.631	0.479	-0.230
RewardingThoseComplyingWithStatusQuo	-0.690	0.387	0.048
a 3 components extracted.			

Appendix 10: Data distribution outliers

Organisational Culture outliers
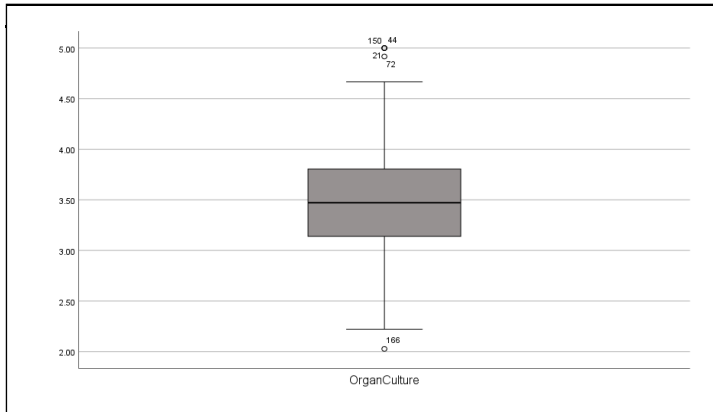
Organisational Innovation outliers
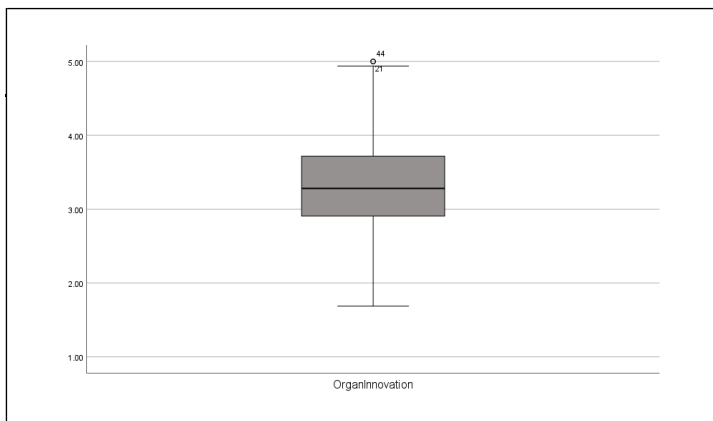
Standardised residuals outliers
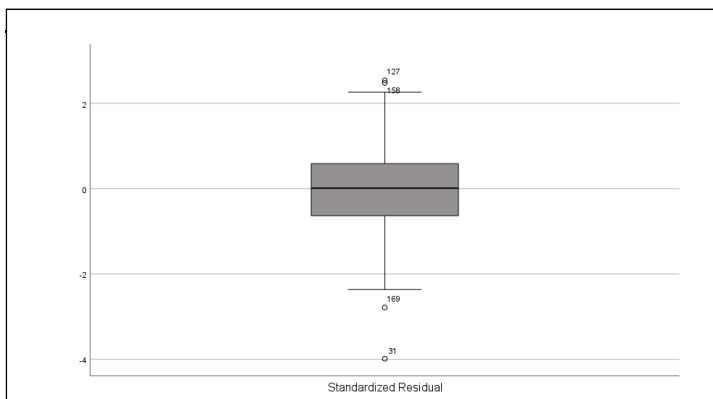
Appendix 11: Tables of hypotheses results

Bivariate regression: OC and OI

Multiple regression: PassiveOC, AggresiveOC and ConstructiveOC and OI

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.577[a]	0.333	0.321	0.53749

a. Predictors: (Constant), ConstructiveOC, PassiveOC, AggressiveOC
b. Dependent Variable: OrganInnovation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.977	3	7.992	27.665	<.001[b]
	Residual	47.957	166	0.289		
	Total	71.934	169			

a. Dependent Variable: OrganInnovFinal2
b. Predictors: (Constant), ConstructiveOC, PassiveOC, AggressiveOC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	0.862	0.296		2.911	0.004	0.277	1.446
	PassiveOC	0.109	0.052	0.143	2.117	0.036	0.007	0.211
	AggressiveOC	0.057	0.049	0.077	1.145	0.254	-0.041	0.154
	ConstructiveOC	0.463	0.053	0.553	8.713	0.000	0.358	0.567

a. Dependent Variable: OrganInnovFinal2

Multiple regression: AggresiveOC and ConstructiveOC, and OI

Model Summaryb

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.562a	0.315	0.307	0.54307

a Predictors: (Constant), ConstructiveOC, AggressiveOC
b Dependent Variable: OrganInnovation

ANOVAa

Model		Sum of Squares	df	Mean Squa	F	Sig.
1	Regression	22.682	2	11.341	38.455	<.001b
	Residual	49.252	167	0.295		
	Total	71.934	169			

a Dependent Variable: OrganInnovation
b Predictors: (Constant), ConstructiveOC, AggressiveOC

Coefficientsa

Model		Unstandardized Coefficients		Standardize	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.162	0.263		4.421	<.001
	AggressiveOC	0.092	0.047	0.125	1.955	0.052
	ConstructiveOC	0.463	0.054	0.554	8.64	<.001

a Dependent Variable: OrganInnovation

Bivariate regression: PassiveOC and OI

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.163[a]	0.026	0.021	0.64563

a. Predictors: (Constant), PassiveOC
b. Dependent Variable: OrganInnovation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.906	1	1.906	4.572	.034[b]
	Residual	70.028	168	0.417		
	Total	71.934	169			

a. Dependent Variable: OrganInnovation
b. Predictors: (Constant), PassiveOC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	2.843	0.219		12.963	0.000	2.410	3.276
	PassiveOC	0.125	0.058	0.163	2.138	0.034	0.010	0.240

a. Dependent Variable: OrganInnovation

Bivariate regression: AggressiveOC and OI

Model Summaryb

Model	R	R Square	Square	the Estimate
1	.096a	0.009	0.003	0.65132

a Predictors: (Constant), AggressiveOC
b Dependent Variable: OrganInnovFinal2

ANOVAa

Model		Squares	df	Square	F	Sig.
1	Regression	0.666	1	0.666	1.571	.212b
	Residual	71.268	168	0.424		
	Total	71.934	169			

a Dependent Variable: OrganInnovFinal2
b Predictors: (Constant), AggressiveOC

Coefficientsa

Model		Coefficients		d			Interval for B	
		B	Std. Error	Beta	t	Sig.	Bound	Bound
1	(Constant)	3.107	0.162		19.133	<.001	2.786	3.427
	AggressiveO	0.071	0.056	0.096	1.253	0.212	-0.041	0.182

a Dependent Variable: OrganInnovFinal2

Bivariate regression: ConstructiveOC and OI

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.547[a]	0.300	0.295	0.54761

a. Predictors: (Constant), ConstructiveOC
b. Dependent Variable: OrganInnovFinal2

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.555	1	21.555	71.879	<.001[b]
	Residual	50.379	168	0.300		
	Total	71.934	169			

a. Dependent Variable: OrganInnovation
b. Predictors: (Constant), ConstructiveOC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	1.436	0.224		6.416	0.000	0.994	1.878
	ConstructiveOC	0.458	0.054	0.547	8.478	0.000	0.351	0.565

a. Dependent Variable: OrganInnovation

Appendix 12: Demographics' ANOVA

Demographics and organisational culture

Tests of differences between demographics and OrganCulture					
ANOVA OC (Age)					
OrganCulture					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.090	3	0.030	0.104	0.957
Within Groups	47.734	166	0.288		
Total	47.824	169			
ANOVA OC (Gender)					
OrganCulture					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.028	1	0.028	0.098	0.755
Within Groups	47.797	168	0.285		
Total	47.824	169			
ANOVA OC (Position)					
OrganCulture					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.626	6	0.438	1.579	0.156
Within Groups	45.198	163	0.277		
Total	47.824	169			
ANOVA OC (Years)					
OrganCulture					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.952	4	0.238	0.838	0.503
Within Groups	46.873	165	0.284		
Total	47.824	169			

Demographics organisational innovation correlations

Tests of differences between demographics and OrganInnovation					
ANOVA OI (Age)					
OrganInnovation					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.399	3	0.133	0.309	0.819
Within Groups	71.535	166	0.431		
Total	71.934	169			
ANOVA OI (Gender)					
OrganInnovation					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.083	1	0.083	0.193	0.661
Within Groups	71.851	168	0.428		
Total	71.934	169			
ANOVA OI (Years)					
OrganInnovation					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.868	4	0.217	0.504	0.733
Within Groups	71.065	165	0.431		
Total	71.934	169			
ANOVA OI (Position)					
OrganInnovation					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.211	6	0.202	0.465	0.833
Within Groups	70.723	163	0.434		
Total	71.934	169			