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**THE INFLUENCE OF NATIONAL CULTURE ON NATIONAL INNOVATIVENESS
IN SELECT AFRICAN COUNTRIES**

PAUL HERMAN KIMBOWA



**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE OF THE MASTER OF COMMERCE
(STRATEGIC MANAGEMENT) OF STRATHMORE UNIVERSITY**

JUNE 2023

DECLARATION

Student's Declaration

I declare that the work produced herein has not been previously submitted for the assessment of a master's degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Student name: **PAUL HERMAN KIMBOWA**

Signature:



Date: 22/ 11/ 2023

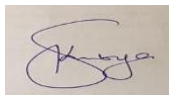
Supervisor's Approval

The research thesis of Paul Herman Kimbowa was reviewed and approved for examination by:

Name of Supervisor: **Dr. STELLA NYONGESA**

Strathmore Business School.

Signature:



Date: 23/ 11/ 2023

ABSTRACT

The world today has become a global village and as such companies no longer simply compete within their home markets but on the international scene as well. Therefore, in order to effectively operate and prosper in foreign markets, firms need to understand the different cultural orientations given that culture drives strategy. Strategy scholars suggest that innovativeness grows the knowledge economy, and greatly boosts competitiveness while ensuring prosperity in not only firms but countries as well. Economics scholars concur that developing countries face genuine obstacles to innovation, and this is precisely why they remain underdeveloped. The situation is rendered more complicated because the developing world presents very diverse situations in terms of levels of development and culture. Hence, the difficulty to innovate at the national level is a major challenge in many African countries. This research study sought to determine the influence of the cultural dimensions of long-term versus short-term orientation, masculinity versus femininity, indulgence versus restraint on national innovativeness in select African countries. The study was anchored on the theory of Competitive Advantage of Nations to underpin the variable of national innovativeness as well as game theory to underpin the variable of national culture. Secondary data was collected from Hofstede's cultural dimensions framework as well as from the Global Innovation Index. The study carried out four pre-diagnostic tests namely multicollinearity test, variance inflation factor test, Breusch and Pagan LM test as well as the Wald test which showed that the dataset was discontinuous, multiple, large, panel data. This research study utilized Pairwise correlation coefficient and random effects regression analysis to rank Hofstede's cultural dimension scores of time orientation, masculinity versus femininity and indulgence versus restraint against the Global Innovation Index scores (GII) for the select African countries whose data was readily available on both indices so as to determine the influence of national culture on national innovativeness in select African countries. The data was processed and analysed using STATA statistical package, version 14. The results/ findings suggest that cultural dimensions have a significant influence on innovation, and that countries with more feminine, long-term oriented, and restrained cultures tend to have higher levels of innovation compared to those with more masculine, short-term oriented, and indulgent cultures in the select African countries. The study recommends that by understanding the influence of national cultural dimensions on national innovation, countries can better develop policies and strategies that promote innovativeness and creativity, ultimately driving economic growth, creating jobs, inclusive and impactful development and shared prosperity. The study encountered some limitations such as reliance on secondary data, narrow focus on national factors leaving out individual and organisational factors that could also have a huge bearing on innovativeness.

Keywords: Innovativeness, Hofstede's cultural dimensions, long-term versus short-term (LTO), Masculinity versus femininity (MAS), Indulgence versus restraint (IND).

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LIST OF ABBREVIATIONS

GII – Global Innovation Index

NI – National Innovativeness

SII – Summary Innovation Index

EIS – European Innovation Scoreboard

IUS – Innovation Union Scoreboard

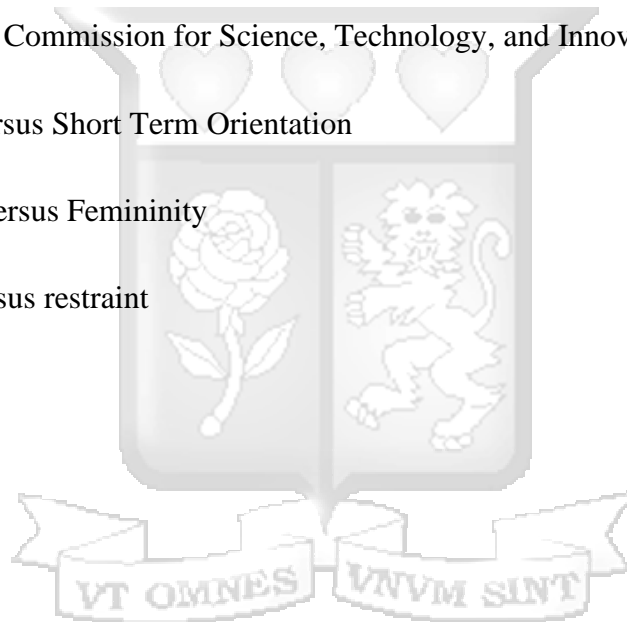
MNCs – Multinational Companies

NACOSTI – National Commission for Science, Technology, and Innovation

LTO – Long Term versus Short Term Orientation

MAS – Masculinity versus Femininity

IND – Indulgence versus restraint



DEDICATION

I dedicate this research study to my dearly beloved parents, Edward and Harriet Kitumba, without whose support this academic journey would have been in vain. I also dedicate this to my siblings (Victoria Nabachwa, Charles Muggaga, Valerie Lunkuse, Irene Nabachwa, Edward Kitumba Muggaga, and Victoria Nalule) I and my future spouse and kids.



CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Strategy is the determination of the basic long-term goals of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals (Chandler, 1962). Johnson, Scholes and Whittington (2008) define strategy as the direction and scope of an organization over the long term, which achieves advantage in a changing environment through its configuration of resources and competences with the aim of fulfilling stakeholder expectations. Corporate strategy according to Lynch (2006) can be described as the identification of the purpose of the organization and the plans and actions to achieve that purpose. Lynch (2006) goes on to state that corporate culture consists of two main elements: corporate level strategy and business level strategy. At the corporate level, the culture and leadership of the organization are also important (Lynch, 2006).

According to Harris (1975), culture is the total socially acquired life-way or life-style of a group of people. It consists of the patterned, repetitive ways of thinking, feeling, and acting that are characteristic of the members of a particular society or segment of a society. Furthermore, culture is about that which is taken for granted but nonetheless contributes to how groups of people respond and behave in relation to issues they face (Johnson et. al., 2008). The taken for granted nature of culture is what makes it centrally important in relation to strategy and the management of strategy (Johnson et. al. 2008).

Strychalska (2015) states that culture shapes the way people think about and behave in regard to taking risk, perception of opportunities, and the nature of entrepreneurial activity and, therefore, economic creativity and economic outcomes and it goes further to suggest that culture is a vital factor because countries differ substantially in regard to values, traditions, behaviours and norms which in turn could also affect innovativeness of a nation.

A synthesis of seminal work by Hofstede, Hofstede, & Minkov (2010), Schein (2010), and Schwartz (2011) among others identified four generally accepted attributes of culture namely: shared, pervasive, enduring and implicit. Shared culture refers to common possession with another or others whereas pervasive culture spreads widely throughout a group of people.

Enduring culture refers to its durability or existence over a time and implicit culture is that which is suggested although not directly expressed.

Pertinent to note is that this study used the sociologist response to the central questions in strategy i.e that there are a million reasons why firms may differ and that the same can be found at individual, organizational and environmental level of analysis. Erbing and Young (1979) as cited in Benedict, Steenkamp, Hofstede and Wedel (1999) state that sociologists often have argued that group-level variables can and do have effects over and above the characteristics of the group members.

Lynch (2006) posits that corporate strategy can either be prescriptive or emergent. A prescriptive strategy is a strategy whose objective has been defined in advance and whose main elements have been developed before the strategy commences (Lynch, 2006). Emergent corporate strategy is a strategy whose final objective is unclear and whose elements are developed during the course of its life, as the strategy proceeds. The main areas of prescriptive strategy theory are game-based, industry and environment based, resource based, and co-operation and network-based theories of strategy. The emergent strategies consist of uncertainty based, survival-based, human-resource based as well as innovation and knowledge-based theories of strategy.

Lynch (2006) states that innovation and knowledge-based theories of strategy privilege the generation of new ideas and the sharing of these ideas through knowledge as being the most important aspects of strategy development. Innovation is the development and implementation of new ideas to solve problems (Dosi, 1988). In today's world, many firms, local and global struggle with developing an innovative culture within their human resource and as such fail the accounting principle of going concern, which Fremgen (1968) defined as "in the absence of evidence to the contrary, the entity is viewed as remaining in operation." Innovation is important at the national level for promoting economic development (Strychalska, 2015).

Innovation is crucial for growth and prosperity given that firms find that they have to compete across borders in today's globalized economy. There is a rapidly diminishing importance of national borders due to globalization. With it has come the rise of multinational companies that trade across borders like the Japanese Toyota Motor Corporation, American-founded Ford Motor Corporation, Chinese-owned TikTok (Byte Dance), Kenyan-founded Equity Bank

Holdings, KCB Group, ICEA Lion Group, Safaricom, Nigerian-founded UBA Group, Access Bank, Dangote Group among others.

It has been argued that:

“Given the globalization of business, the increasing interpenetration of businesses across cultures, the international mobility of managers and other forms of labor, and the trend toward the dispersion of innovative activity across national boundaries, it has become increasingly important that there is an informed understanding of the extent to which creativity and innovation processes vary around the world” (Cox, 2017).

Porter (as cited in Boubakri, 2021) points out that firms must innovate to enhance their competitive advantage and survive in an increasingly globalized environment. Innovation can lead to higher productivity, meaning that the same input generates a greater output. As productivity rises, more goods and services are produced – in other words, the economy grows (ECB, 2017). Innovation is a key catalyst of economic development, at the macro level and thus an enabler of productivity and quality of life. Countries may not be able to increase their rates of innovation simply by increasing the amount of money spent on research and development or industrial infrastructure. They also may need to change the values of their citizens to those that encourage innovative activity (Shane, 1993).

Researchers such as Hussler (2004), Kaasa (2010), (Cox, 2017), and Kaasa (2009) suggest a significant relationship between a nation’s culture and its level of innovativeness. Geert Hofstede makes a strong argument on how culture influences the actions of individuals and by extension, companies, and nations through the six-dimension framework.

Strychalska (2015) emphasizes that “Max Weber had it right because if we learn anything from the history of economic development, it is that culture makes almost all the difference”. Thus, culture drives strategy, strategy is concerned with performance and innovation is a metric of performance. This is a relationship that has been thinly evaluated, hence limited empirical evidence to guide future studies especially on the African continent. Innovation is important for driving economic progress and competitiveness – both for developed and developing economies.

It is important to note that Hofstede’s work on national culture has been criticized by scholars such as Peterson and Smith (2008) who argued that studies of individuals show significant

within nation variance, that nations have regional, ethnic, or other subcultures and that structural theories in general have been challenged. The limitations have been comprehensively discussed in chapter two of this study.

1.1.1 National culture

Dawar and Parker (1994) as cited in Benedict, Steenkamp, Hofstede and Wedel (1999) state that culture can be conceptualized at different levels, including the national level. Hofstede as cited in Morden (1999) defines national culture as the collective mental programming of the people of any particular nationality.

Inglehart and Baker (2000) as cited in Minkov (2013) state that despite globalization, the nation remains a key unit of shared experience and its educational and cultural institutions shape the values of almost everyone in that society. Many writers, perhaps the most well-known of which is Geert Hofstede, have shown how attitudes to work, authority, equality and other important factors differ from one country to another (Johnson et. al, 2008). National culture can therefore be looked at from a myriad of angles.

The eight-scale tool for mapping cultural differences is a framework for understanding cultural disparities among groups of people. The tool possesses eight scales namely communicating, evaluating, persuading, leading, deciding, trusting, disagreeing, and scheduling (Meyer, 2014). Mapping leadership cultures, Meyer (2017) states that attitudes toward decision making can range along a continuum from strongly top-down to strongly consensual; attitudes toward authority can vary from extremely egalitarian to extremely hierarchical. However, this tool examined culture more at a personal level and was more beneficial to individuals/ executives seeking to understand how people in other jurisdictions related with one another.

High and low context cultures is also a framework that has been used to explain culture. Context is defined in this case in terms of how individuals and their society seek information and knowledge (Morden, 1999). People from high context cultures obtain information from personal information networks whereas people from low context cultures seek information about decisions and deals from a research base. This research study found this model to be too narrow and not robust enough simply because it focused on how individuals and their society seek information and knowledge.

Lewis (1992) as cited in Morden (1999) differentiates monochronic and polychronic cultures as detailed below. Monochronic cultures act in a focused manner, concentrating on one thing at a time within a set time scale whereas polychronic cultures are flexible and unconstrained by concerns with time (Morden, 1999). This too is a narrow way to look at national culture.

In a research study into the differences between national culture by Hofstede et al. (2010) identified five dimensions by which one national culture might differ another: power distance, uncertainty avoidance, degree of individualism, its extreme opposite being collectivism, degree of masculinity, its extreme opposite being femininity; short and long-term orientation, degree of indulgence, its extreme opposite being restraint/ repress.

The main contribution of Hofstede et al. (2010) to the area of organisational studies was to come up with a view of utilizing the variable of culture for countries. The same study also recognized that national culture impacts organisations in a myriad of ways, given that it affects the way in which organizational goals are defined, managerial decision-making, firm structure and size, and the recognition of certain attributes.

Hofstede's work (as cited in Ming-Yi ,2006) on work-related cultural dimensions has been regarded as a paradigm in the field of cross cultural studies. The country classification on the dimensions has been frequently cited by researchers such as Cox (2017), Kaasa (2009) in the past few decades.

Long-term versus short term orientation, one of the dimensions, refers to the temporal tolerance (patience) that individuals of a culture have for obtaining success and results (Hofstede et al. 2010). Rinne (2012) states that parsimony and perseverance are associated with long-term orientation, while short-term orientation is associated with respect for tradition and fulfilment of social obligations. Therefore, firms with cultures with greater long-term orientation will tend not to adopt short-term goals or the correction of problems in a way that is not very structured. It is prudent to note that long term-oriented societies take a long-term approach and focus on the future. Henceforth, the same focus on modern education and less on time honoured traditions to prepare for the future whereas the reverse is true for the short-term oriented societies.

Degree of masculinity (masculinity versus femininity) is another dimension advanced by Geert Hofstede and measures how much individuals in a particular culture value "doing" or "execution" rather than observation and reflection, the latter two being characteristics of the

femininity of the culture (Hofstede et al., 2010). According to Hofstede et al. (2010), the masculinity aspects for nations are clearly defined: men tend to be assertive and focused on earnings; while women tend to be more careful, and concerned about the quality of life (Mihet, 2013). Hofstede et al. (2010) identified that the masculinity–femininity dimension is the only one of the first five dimensions that does not bear a relationship to an “economic component”. Therefore, the masculinity–femininity of a culture is the only “purely social” dimension (Prim, 2016). However, it is vital to examine this dimension as having an influence on national innovativeness given that certain attributes (meritocracy) feature prominently in firms and nations around the world. High scores on Masculinity (MAS) represent a society that is focused on achievement, competition, and assertiveness, while lower scores suggest a cooperative society focused on relationships and quality of life.

Degree of indulgence (Indulgence versus restraint) is also a dimension that Hofstede advanced to explain national culture. This measure evaluates by how much the individuals of a particular culture control their impulses and desires. In this sense, members of more indulgent societies tend to be more permissive when it comes to realising their own desires related to taking advantage of life and having fun, while the members of more restrictive societies believe that such things should be regulated by strict rules (Hofstede et al., 2010). In most firms around the world, it is closely associated to not only the structure but rules of conduct as well. Indulgence (IND) represents a society that allows free fulfillment of human needs, enjoying life and having fun. Lower scores represent a society governed by strict norms that believes in suppressing gratification (restraint).

Power distance is perhaps the most common of the dimensions. The power distance dimension measures the aversion of the individuals of a particular culture to very concentrated power distributions and status. So the greater the power distance, the bigger the belief of the members of that culture that the way of centralised and asymmetrical power structures is appropriate for the social structure to function fully (Hofstede et al., 2010). While high power distance nations are more autocratic and their individuals are more willing to accept differences in power and wealth, low power distance nations encourage democratic forms of participation (Mihet, 2013).

Uncertainty avoidance is another of Hofstede’s cultural dimensions. A high degree of uncertainty avoidance would indicate a culture whose members would be unable to deal with not very clear situations (Hofstede et al., 2010). Uncertainty avoidance in firms is shown through transparency and compliance with policies, rules, strategies and plan. Henceforth, the

lack of clarity transmitted by the leaders to their subordinates with regard to the direction of an organisation can stimulate or repress their innovative insight (Pinto, 1988).

Degree of individualism is also one of Hofstede's cultural dimensions. The degree of individualism dimension of a culture refers to the predisposition of its members to value or worry more about themselves and their families than about other members of their social group. Individual triumphs are valued more in this type of culture. According to Mihet (2013), on average, developed countries tend to be more individualistic than emerging countries because there is less need to rely on other people. On the other hand, the degree of collectivism of a culture refers to the predisposition of its members to value participation in and acceptance by social groups. The group protects those individuals who form part of the same and it is expected that they will act as a function of the group objectives (Hofstede et al., 2010).

Therefore, this research study relied on Hofstede's cultural dimensions to measure national culture. In particular time orientation, masculinity vs femininity and indulgence vs restraint were used because these three dimensions are the most likely to influence innovation projects (Shane, 1993). Hofstede's database considers 94 countries worldwide however, for this study, the focus was on African countries. Since national cultures remain relatively stable over long periods of time, the information herein does not hinder the data from being useful over extended periods (Prim, 2016). Furthermore, these three dimensions are most likely to influence innovation projects (Shane, 1993). GLOBE concluded that societal culture significantly affects organizational culture and consequently overlaps with it to a considerable degree (Minkov, 2013).

1.1.2 National Innovativeness

A nation's competitiveness depends on the capacity of its industry to innovate and upgrade (Porter 1990). Thus, innovation is the soul of a nation's progress. Porter and Stern (2001) as cited in Deckert and Schomaker (2022) define national innovativeness as a country's potential to produce a stream of commercially relevant innovations. Innovation is important for driving economic progress and competitiveness – both for developed and developing economies. Many governments are putting innovation at the center of their growth strategies (GII, 2022). To measure national innovativeness, a number of measures and indices used by earlier researchers, and these include NIS, SII, EIS, ease of doing business index, ATHGO innovation index, and GII. Each of these methods for measuring national innovativeness are further explained below.

A national innovation system (NIS) can be perceived as a historically grown subsystem of the national economy in which various organizations and institutions interact with and influence one another in the carrying out of innovative activity (Markus, 2004). It has been argued that:

“Using the NIS approach implies that innovative activity is usually analyzed in a broader sense: Instead of focusing solely on the number of introduced product and process innovations in a country, it encompasses also research and development efforts by business firms and public actors as well as the determinants of innovation such as, for instance, learning processes, incentive mechanisms or the availability of skilled labor.”

The measurement and assessment of national innovation systems has centered on four types of knowledge or information flows: 1) interactions among enterprises, primarily joint research activities and other technical collaborations; 2) interactions among enterprises, universities and public research institutes, including joint research, co-patenting, co-publications and more informal linkages; 3) diffusion of knowledge and technology to enterprises, including industry adoption rates for new technologies and diffusion through machinery and equipment; and 4) personnel mobility, focusing on the movement of technical personnel within and between the public and private sectors (OECD 1997). However, the NIS does not provide a comparison or ranking of countries. It acts as a guide to nations striving to increase their innovativeness.

Summary innovation index (SII), published by the Innovation Union Scoreboard (IUS) applies to member countries of the European Union or nations that wish to become its members. The IUS is a tool meant to examine the implementation of innovativeness of European member states thus rendering it unusable for this study that is looking at national innovativeness in select African countries. Furthermore, the SII uses twenty-five (25) indicators.

The annual European Innovation Scoreboard (EIS) provides a comparative assessment of research and innovation performance in EU member countries and selected third countries, and the relative strengths and weaknesses of their research and innovation systems (European Commission, 2022). The EIS assists nations to know the key areas on which to focus their attention so as to increase their innovativeness. The EIS also does not provide sufficient data on the state of national innovativeness in Africa.

The ATHGO innovation index identifies which of the African countries have the appropriate ecosystem to reach and maintain continuity in innovation – a key ingredient for sustained

growth and prosperity (ATHGO, 2022). It premises its scores on three (3) items that is network, intellectual and financial capacity.

The ease of doing business index was an index designed to analyse how to build effective institutions and drivers for institutional change. It is published annually by the World Bank Group. However, the report was discontinued by the World Bank on September 14, 2021, following the release of an audit documenting how bank leadership pressured experts to manipulate the results of the 2018 and 2020 reports (The World Bank, 2021).

The Global Innovation Index (GII) is an annual worldwide ranking of countries by their ability for and success in innovation, published by the World Intellectual Property Organization (GII, 2022). Many governments are putting innovation at the center of their growth strategies. In that light, measuring innovation and providing a rigorous statistical benchmark that attempts to capture national innovation ecosystems is at the core of the WIPO Global Innovation Index team and mandate (Global Innovation Index, 2022).

GII (2022) states that “the GII project was launched by Soumitra Dutta, Dean of Saïd Business School at Oxford University, in 2007 during his tenure at INSEAD. WIPO’s association with the GII started in 2011 and it began co-publishing the GII in 2012. In 2013, Cornell University joined as co-publisher, with Professor Dutta representing the GII at Cornell University and Bruno Lanvin at INSEAD”. The GII 2022 model includes 132 economies, which represent 94.3% of the world’s population and 99.0% of the world’s GDP in purchasing power parity current international dollars (GII, 2022). It goes ahead to unpack the most innovative economies in the world through the ranking of country performance around the world.

The GII consists of two sub-indices that is innovation input and innovation output. The innovation inputs are conditions necessary for obtaining innovation for instance institutions, human capital and research, infrastructure, market sophistication and business sophistication. The innovation outputs represent performance and are characterized by knowledge and technology outputs, creation outputs. GII indices are premised on ninety-one (91) indicators thus making it the most robust measure of national innovativeness.

The aim of the GII is to provide insightful data on innovation, to track major innovation developments at the country and regional level and, in turn, to assist policymakers in evaluating their innovation performance and making informed innovation policy decisions (Global Innovation Index, 2022). The current study used the overall GII average score, which is an

average of the input and output sub-indices to establish the influence of national culture on national innovativeness. This research study selected the Global Innovation Index to measure national innovativeness not only because it is inclusive of both innovation input and innovation output points and indicators for each country but also due to the assurance of empirical support which is verifiable, rigorous and tested as well.

1.1.3 Overview of National Culture in select African countries

“If there is no such thing as national culture, what holds together a country’s regions and accounts for the formation of fairly homogeneous clusters of such regions clearly distinguished from the clusters that the in-country regions of the neighboring nations form? (Minkov, 2013). Africa is a continent of significant cultural diversity. Pinxteren (2019) states that decades of nation building in Africa must have made their mark. Is it possible nowadays to distinguish national cultures in Africa, or are the traditional ethnolinguistic distinctions more important? Culture scholars like Adebajo (2010) and Asiwaju (1985) as cited in Pinxteren (2019) concur that it is common knowledge that the current nation states in Africa were formed by the colonial powers with little regard for the linguistic or cultural characteristics of Africans. This led to the splitting up of previously integrated economic, linguistic, and/or cultural units.

For Sub-Saharan Africa, Minkov and Hofstede examined seven countries, together representing 64 administrative regions. They found that 58 of the 64 African regions, or more than 90%, clustered together with the other regions of their nation, forming homogeneous national clusters (Pinxteren, 2019). Research has shown that there are similarities between Africa’s Ubuntu culture and the Chinese Confucius philosophy that might form a strong pillar for Chinese investments in this part of the world (Nyambegera, 2016). Nyambegera (2016) goes on to state that it is envisioned that there are inherent challenges faced by both Chinese and African practitioners that might call for revolutionary actions to untangle the barriers in other cultural dimensions such as work attitudes, trust, the place of work in one’s life and what employees’ value in work in this complex management transfer process. This research study focused on select African countries whose data was readily available from Hofstede’s cultural dimensions index and the global innovation index.

1.1.4 National Innovativeness in select African countries

As a continent, Africa has been making steady progress in its digital maturity and in improving the key drivers of technological advancement and innovation (Maher, 2021). Innovation is absolutely key to African stability and growth in the coming decades (Makhtar, 2017). Africa

can and does innovate. There exist many examples of innovation in Africa for instance mobile money which simply is a system where people with a mobile phone can deposit, transfer, or withdraw funds without even having a bank account. Lashitew, van Tulder and Liasse (2019) as cited in Allard and Williams (2020) show how Africa more recently has had the highest mobile money adoption rate in the world. Makhtar (2017) states that as of 2015, more than 222 million mobile money accounts were registered across Africa, and African countries account for more than half of all mobile money services worldwide. Development processes, and innovation climates in particular, are considerably affected by socio-cultural patterns proper to each civilization, country and even to each region within a country (Aubert, 2004). Robson, Haugh and Obeng (2009) as cited in Allard et. al. (2020) also note that incremental innovation was present in their study of small businesses in Ghana.

In today's world, many firms, local and global struggle with developing an innovative culture within their human resource. Examples that attest to this include Blackberry, Kodak, Nokia, Nakumatt, Tuskys, Imperial Bank, Chase Bank, Kenya National Assurance Company, and Concord Insurance among others. Whereas many of the firms listed above cite liquidity issues, upon an in-depth analysis, it is important to note that the proximate cause was not coming up with new products, services, or modus operandi to attract and retain customers as evidenced by the fact that new players or existing ones took up their market share. For instance, RIM's Blackberry was overtaken by Apple's iPhone, and Kodak was overrun by smartphones and Instagram. It is pertinent to note that most of these firms initially had a financial muscle that their rivals could not match although one wonders why they weren't able to leverage it to foresee the changing customer tastes and preferences.

Oyelaran-Oyeyinka, Laditan and Esubiyi (1996) as cited in Allard et. al (2020) show how adaptive and incremental industrial innovation took place in Nigeria in the 1990s, motivated by a range of constraints, both physical and institutional, that local firms faced. In the tourism sector, Carlisle, Kunc, Jones and Tiffin (2013) as cited in Allard et. al (2020) examine cases of innovation in The Gambia and Tanzania, arguing that the institutional environment needs to support tourism innovation especially through collaborations and networking in order to make African destinations attractive.

Only two nations—South Africa and Kenya—have comprehensive regulations related to innovation (Maher, 2021). Pertinent to note is the diversity of the continent's markets which essentially means that there is no regular approach to curating and nurturing an innovation-

driven economy that will work in all parts of Africa. According to the EAC (2011) (as cited in Kiraka, Kobia & Katwalo (2013) the conference recommended that EAC member states should mobilise resources for training and also invest in programmes that focused on innovation in women owned enterprises. Understanding of the cultural orientations and their influence is key to designing the most appropriate strategies and mixes of policies on which to anchor national innovativeness frameworks/ strategic plans in the select African countries.

1.2 Statement of the Problem

Prim (2016) states that innovation is a driver for the economic progress and competitiveness of both developed and developing economies. In a world of increasingly global competition, nations have become more, not less, important (Porter, 1990). Furthermore, innovation is currently considered to be one of the drivers of national economies and one of the main influencers of company competitiveness and performance. The level of innovation within a society is directly proportional to the encouragement and status given to entrepreneurial efforts within the culture (Herbig, 1998). Prim (2016) states that many firms today face the challenge of innovation and subsequently performing better than their competitors. Kantor (2001) (as cited in Kiraka et. al., 2013) argued that without innovation through new product development and access to higher value markets, the potential for success for MSMEs in these sectors is low. Innovation is the soul of a nation's progress and as such, many governments are putting innovation at the center of their growth strategies (Global Innovation Index, 2022). Strychalska (2015) states that the level of innovation within a society is directly proportional to the encouragement and status given to entrepreneurial efforts within the culture.

However, developing countries face genuine obstacles to innovation and this is precisely why they remain underdeveloped (Aubert, 2004). The situation is, however, rendered more complicated because the “developing world” presents very diverse situations in terms of levels of development, culture, etc (Aubert, 2004). On the enterprise side, generally a large number of micro-enterprises operate in the informal economy, and a more or less important number of foreign-based firms, which tend, however, to be disconnected from the rest of the economy (Aubert, 2004). Therefore, the difficulty to innovate at the national level is a huge challenge in select African countries. Research studies such as Prim (2016), Cox (2017), Herbig (1998) among others have sought to address this issue although contextual, knowledge and theoretical gaps came into play.

Thus, there is a need to think about innovative approaches adapted to the needs and possibilities of developing countries (Aubert, 2004). Consequently, innovation policy schemes have to be tailored to countries' specific characteristics in line with the recognized fact that "one size does not fit all", and the recognized need for working much more on national peculiarities in all walks of development economics and policies (Aubert, 2004). The relationship between culture and innovation may have implications for organizational culture (Cox, 2017). Empirical studies of Williams (2010), Cox (2017), Gullen and Deckert (2021), Barbosa, Ramirez and Paramo (2022), Everdingen and Waarts (2003), Andrijauskiene and Dumciuviene (2017) among others anchor the theoretical arguments that culture powerfully shapes the character of national innovation. A society's values give social direction to the process of technological development. Herbig (1998) emphasizes that the social organisation of a culture may either foster or inhibit technological development because culture tends to operate as a source of authority, responsibility, and aspiration, thus influencing the course of technological advance and the creation of material culture.

1.3 Research Objectives

This study was guided by one general and the specific objectives as listed below.

1.3.1 General Objective

The general objective of this study was to determine the influence of national culture on national innovativeness in select African countries.

1.3.2 Specific Objectives

Therefore, the study aimed to achieve the following specific objectives;

- i. To determine the influence of long-term versus short-term (LTO) cultural dimension on national innovativeness in select African countries.
- ii. To evaluate the influence of masculinity versus femininity (MAS) cultural dimension on national innovativeness in select African countries.
- iii. To determine the influence of indulgence versus restraint (IND) cultural dimension on national innovativeness in select African countries.

1.4 Research Questions

In order to address the above objectives, the study sought to answer the following research questions;

- i. What is the influence of the long-term versus short-term (LTO) cultural dimension on national innovativeness in select African countries?
- ii. What is the influence of the masculinity versus femininity (MAS) cultural dimension on national innovativeness in select African countries?
- iii. What influence does the indulgence versus restraint (IND) cultural dimension have on national innovativeness in select African countries?

1.5 Scope of the Study

The geographical scope of the study was on select African countries whose data is readily available on the revised 2015 Hofstede's cultural dimension indices (LTO, MAS & IND) as well as the published Global innovation index (GII) reports from 2011 to 2022. See appendix III.

Furthermore, this research study was theoretically anchored on the Theory of Competitive Advantage of Nations by Michael Porter (Porter, 1990) as well as Game Theory. It is also prudent to note that this was strategic management research, which simply is a domain of social science that is concerned with explaining and predicting differences in organisation outcomes i.e performance. The methodology employed herein was pairwise correlation coefficient and random effects regression analysis.

1.6 Significance of the Study

The study will be a practical guide to those intending to do business in select African countries thus increasing the ease of doing business, simplifying global marketing activities, making African countries more competitive and increasing foreign direct investments. It is prudent to note that innovativeness grows the knowledge economy, greatly boosts competitiveness while ensuring prosperity in not only firms but countries as well.

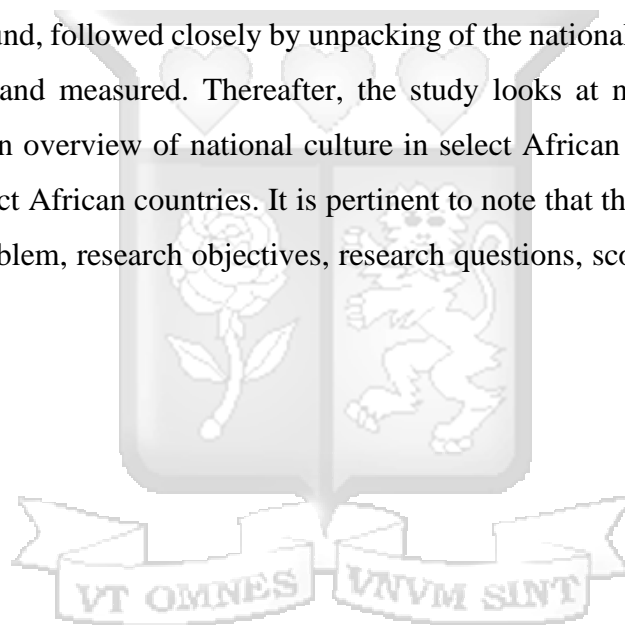
This research study is also a building block on the sustainable development goal (SDG) nine (9) which is "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation" (UN Department of Economic & Social Affairs, 2016).

The research study will be of great significance as it will build on the body of knowledge in the realm of the influence of national culture on innovativeness in select African countries which has been a huge gap as preliminary studies were based on Europe and did not include the African context.

The policymakers will also stand to benefit from this study in the sense that it will offer a prism into the salient parts of cultural orientations of the select African countries and how they can be utilized to increase not only innovativeness but entrepreneurship and subsequently job creation thus reducing unemployment.

1.7 Chapter summary

Chapter one of this research has been premised on unpacking the variables under study. It began with a background, followed closely by unpacking of the national culture and how it has been operationalized and measured. Thereafter, the study looks at national innovativeness followed closely by an overview of national culture in select African countries and national innovativeness in select African countries. It is pertinent to note that the chapter also includes a statement of the problem, research objectives, research questions, scope and significance of the study.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature from other scholars who have been closely engaged to the theme and objectives of this study. This chapter presents a number of theories that have been advanced and relate to the area of study. The empirical review discusses previous studies on the research variables and is crucial in the analysis of the key themes related to the research questions presented in this chapter. The chapter also outlines the research gaps indicating areas that have not only not been researched but also those that have been thinly evaluated. Towards the end of the chapter, a conceptual framework and operationalisation of the study variables is provided.

2.2 Theoretical Review

This research study relied on the Theory of the Competitive Advantage of Nations by Michael Porter to underpin the variable of national innovativeness while Game Theory was used to underpin the variable of National Culture. These theories have been explained at length below.

2.2.1 The Competitive Advantage of Nations Theory

The theory of Competitive Advantage of Nations states that national prosperity is created, not inherited. A nation's competitiveness depends on the capacity of its industry to innovate and upgrade (Porter, 1990). This theory was authored by Michael E. Porter in 1990 in a journal article in which he sought to explain the sources of competitiveness between countries/ nations. Competitiveness is the ability to improve continuously process capabilities (Rainer, 1994). Competitiveness at the national level is largely defined as productivity. Productivity is the value of the output produced by a unit of labor or capital (Porter, 1990). A country's standard of living depends on its firm's capacity to achieve high levels of productivity over time. Sustained growth of productivity necessitates that an economy indulges in continuous upgrade.

Innovation and upgrading gives the country's companies a competitive advantage against other companies globally. The theory went on to expound that a country's competitiveness is created and maintained through its highly localized processes (Porter, 1990). A nation's culture, economic structures, institutions, history and national values also contribute greatly to their

success. Therefore the stated factors cause a disparity in the patterns of competitiveness in each nation which leads to countries being competitive in certain industries. The theory goes further to guide that companies operating in global markets ought to focus on innovation which gives them a competitive advantage over others in the market through addressing foreign and domestic needs (Porter, 1990).

Porter (1990) argues that the key for these innovations and improvements is through information which can be gained through research. Rainer (1994) also argued that competitiveness can only be sustained if an appropriate balance is maintained between these factors which can be of a conflicting nature. Customer values, shareholder values as well as the ability to react were considered by Rainer (1994) as the components of competitiveness. This theory attempts to answer the questions Why do some companies based in some nations innovate more than others? Why do some nations provide an environment that enables companies to improve innovate faster than foreign rivals?

The theory of Competitive Advantage of Nations has faced criticisms from scholars who stated that there were elisions with respect to the object of the analysis which meant that explanations for productivity at national level became confused with explanations for industry level success in gaining market share, fundamental misunderstandings of the factors which determine trade, particularly with respect to the principle of comparative advantage and that there were flaws in the methodology and mode of reasoning (Davies and Ellis, 2002). Despite these shortcomings, this theory was useful for this study in as far as underpinning the variable of national innovativeness given that strong 'diamonds' are not in place in the home bases of many internationally successful industries (Davies & Ellis, 2002). The theory of Competitive Advantage of Nations theory underpinned the variable of national innovativeness.

2.2.2 Game Theory

Game theory could be formally defined as a theory of rational decision in conflict situations (Bhuiyan, 2016). Bhuiyan (2016) states that game theory is the study of how players should rationally play games. Therefore, every player anticipates winning the game at the end of it all with a large enough payoff. Each player believes that he/ she has control over the outcome due to his/ her choice of strategy. Kelly (2003) (as cited in Bhuiyan, 2016) states that game theory is the theory of independent and interdependent decision making in organizations where the outcome depends on the decisions of two or more autonomous players, one of which may be

nature itself, and where no single decision maker has full control over the outcomes. This theory underpinned the variable of culture.

Bhuiyan (2016) goes further to state that the initial discussion of game theory occurred in a letter written by James Waldegrave in 1713. John Von Neumann and Oskar Morgenstern published the *Theory of Games and Economic Behavior* in 1944 and it introduced the economic and mathematical basis for the field we now call ‘Game theory’ (Bhuiyan, 2016). The researchers went on to discover that the social and economic questions could be expressed as mathematical models of suitable games of strategy. Game theory has been and continues to be used in business, biology, political science, psychology, and economics. The theory avails a great deal of instruments for solving problems in strategy. It is pertinent to note many countries have short- and long-term strategic plans in place for the betterment of not only their citizens but companies as well. The epistemic approach to game theory provides a formal analysis of strategic reasoning, making explicit player’s knowledge or beliefs about the structure of the game and the strategies, knowledge and beliefs of other players (Bicchieri, 2007). The theory is also a useful and potential tool for the understanding of human affairs (Bhuiyan, 2016).

Game theory has faced a number of criticisms from a number of scholars who stated that game theory is hard to use and test, it threatens to explain anything, it generates customized models of local settings rather than general regularities, and it offers only part of the advice a manager needs (Camerer, 1991). Despite these shortcomings, this research study will anchor on it to understand the variable of national culture given that game theory could be a fruitful source of ideas and testable implications for strategy.

In conclusion, the research study chose the two theories explained above simply because the latter are best placed to answer the issues at hand. It is also prudent to note that the principle of dominance applies to this research study.

2.3 Empirical Review

In this section, the researcher reviewed previous studies on the research topic, took a thorough analysis and synthesis of the main themes related to the research questions. Henceforth, the review shared herein reflects the empirical studies that have been conducted to link national culture and national innovativeness. Hofstede’s work has been criticized as having limitations/gaps by several scholars like Peterson and Smith (2008) in Minkov (2013) who identified three

main kinds of critiques of the use of nations as units of cross-cultural comparisons as elucidated herein.

Firstly, that studies of individuals show significant within-nation variance. The response to that being saying that groups, such as nations, should not be studied because the elements that they consist of are much more heterogeneous than the nations that these elements make up is like saying that individuals need not be studied because the cells that they are made of are much more diverse than the human beings on our planet (Minkov, 2013).

Secondly, that nations have regional, ethnic, or other subcultures. The response to that being “If there is no such thing as national culture, what holds together a country’s regions and accounts for the formation of fairly homogeneous clusters of such regions clearly distinguished from the clusters that the in-country regions of the neighboring nations form? (Minkov, 2013).

Thirdly, structural theories in general have been challenged. This argument suggests that the use of nations as a unit of analysis that Peterson and Smith (2008) refer to is purely theoretical. The response to that was that without empirical evidence, one can defend any abstract theoretical position (Minkov, 2013).

Despite these criticisms, Hofstede’s work on culture is the most widely cited when explaining national culture, values and culture (Bond as cited in Michael, 2007). Michael (2007) argues that Hofstede’s observations and analysis provide scholars and practitioners with a highly valuable insight into the dynamics of cross-cultural relationships. Bhagat and McQuaid (1982) (as cited in Michael, 2007) state that undoubtedly, the most significant cross-cultural study of work-related values is the one carried out by Hofstede.

2.3.1 Long Term Orientation (LTO) and National Innovativeness

The long-term vs. short-term orientation dimension refers to the temporal tolerance (patience) that individuals of a culture have for obtaining success and results (Hofstede et al., 2010). In an empirical study to determine the role of power distance and individualism in national-level innovation success using correlation and multiple linear regression, Rinne (2012) states that parsimony and perseverance are associated with long-term orientation, while short-term orientation is associated with respect for tradition and fulfillment of social obligations. Long term orientation is an orientation that has been positively acknowledged as having an effect on innovation performance.

An empirical study by Cox (2017) explored the relationships between country culture and national innovation in ninety-six (96) countries and revealed that an encouragement of achievement and long-term thinking are very important features of innovative nations. Cox (2017) further established that long-term oriented societies (pragmatic) will be more innovative than short term oriented (normative) societies. Pertinent to note is that this study used correlation and regression analysis. In another research study by Prim et. al (2017) to ascertain the relationship between national culture dimensions and degree of innovation in a sample of seventy-two countries, the authors used correlation, multiple regression and cluster analysis technique and found out that the greater the long-term orientation, the greater the innovation output of the country. In an empirical study to determine the impact of culture on the innovative strength of nations in a sample of select European countries, Moonen (2017) showed that there is a positive relationship between long-term orientation and innovation strength.

In an empirical research study that investigated the effects of national culture on the adoption of innovations using the Hofstede's dimensions using a sample of ten (10) European countries, Everdingen and Waarts (2003) found that higher degrees of long-term orientation were related to increased adoption of innovations. The findings of Herbig and Dunphy (1998) (as cited in Andrijauskiene, 2017) confirmed that societies characterized as long-term orientated ones have higher innovation capacities. However, the above-mentioned studies focused on Europe and South America hence contextual gaps as well as employing pearson correlation coefficient and multiple linear regression which this study sought to address.

2.3.2 Masculinity versus Femininity and National Innovativeness

Hofstede (as cited in Cox, 2017) argues that masculine cultures are more achievement oriented and exhibit less gender egalitarianism whereas feminine cultures are more relationship oriented and exhibit greater gender egalitarianism. In determining the influence of masculinity/femininity on innovation in a sample ninety-three countries using correlation and regression analysis, Cox (2017) found that feminine societies (low masculinity) will be more innovative than masculine countries. The same study goes on to state that sharing of information, the promotion of collaboration, a warm, non-conflictive climate and socio-emotional support help employees to cope with the uncertainty related to new ideas.

Another study by Prim et al. (2017) in a sample of seventy-two countries seeking to explore the relationship between national culture dimensions and degree of innovation in a sample of

seventy-two countries, the authors used correlation, multiple regression and cluster analysis technique discovered that the smaller the degree of masculinity, the greater the innovation output of the country. However, it has also been proposed that masculinity has no effect on economic creativity (Williams, 2005). In a research study on the impact of culture on the innovative strength of nations, the researchers found that there is a negative relationship between masculinity and creativity and the initiation of innovation as well as a positive relation between masculinity and the implementation of innovation due to the urge of economical achievement (Moonen, 2017).

The effect of masculinity/femininity dimension on innovation has not been unanimously proved in previous research. Shane (1993) as well as Williams and McGuire (2005) demonstrated no effect of masculinity on innovation. Later studies juxtaposed the earlier ones with different results. An empirical study into the influence of social capital and cultural dimensions of innovation identified a positive correlation between masculinity and innovation (Willems, 2007). The same study examined the relationship between masculinity, employee empowerment, and innovation and found a significant relationship between low masculinity and the willingness for managers to delegate or empower employees, and a significant positive relationship between employee empowerment and a country's capacity for innovation.

However, a study by Kaasa and Vadi (2008) on how culture contributes to innovation in European countries confirmed the hypothesis of negative relationship between masculinity and innovation initiation. A research study by Nakata (1996) (as cited in Andrijauskiene, 2017) found that in feminine societies, focus is on people and a more supportive climate can be found. (Steensma, 2000) found that in countries with high masculinity, small and medium sized firms were less likely to use alliances for technological innovation.

The results of studies looking at the relationship between masculinity versus femininity and national innovativeness have been mixed with either no relationship found between the two variables or some indication that feminine cultures may be more apt to encourage organizational norms that are more favorable to innovation for instance staff empowerment, information sharing among others hence bringing about knowledge and contextual gaps that this study sought to address.

2.3.3 Indulgence versus Restraint and National Innovativeness

Hofstede (as cited in Cox, 2017) defined indulgence versus restraint as the extent to which people try/ attempt to control their desires and impulses, based on the way they were raised. Indulgent societies are characterized by a desire to gratify basic and natural human drives related to enjoying life and having fun. Restrained societies suppress gratification of needs by way of strict social norms. People in indulgent societies tend to be more optimistic whereas those in restrained societies tend to be more pessimistic and cynical.

In determining the influence of the sixth dimension of indulgence versus restraint on innovation in a sample of ninety-three countries using correlation and regression analysis, Cox (2017) found that indulgent societies will be more innovative than normative (restraint) societies. The same study also went ahead further to state that cultures with low uncertainty avoidance and high indulgence tend to adopt new technology more readily than cultures with high uncertainty avoidance and low indulgence. Cox (2017) went further to conclude that indulgent cultures tend to create new technology as a way to improve life.

In a similar study over a sample of seventy-two countries using correlation, multiple regression and cluster analysis technique, Prim et. al (2017) identified that the greater the indulgence, the greater innovation output of the country. The study argued further that that more indulgent organisational cultures will be more open to experiment and in this sense they will positively affect the creativity of their individuals and, as a consequence, the innovation capacity of organisations (Prim, 2017). Another empirical study Moonen (2017) discovered that there is a (small) positive relationship between indulgence and innovation strength. Syed (2014) (as cited Andrijauskiene, 2017) confirmed that indulgent societies may encourage innovation as a way to continually satisfy drives related to having fun and enjoying life.

Therefore, in conclusion, earlier studies have posted mixed results on the variables and gone further to imply that innovativeness may develop on the basis of a combination of the cultural dimensions. It is imperative to note that there are quite number of studies which use all the six dimensions of Hofstede although the bulk of them are focused on Europe, North & South America and some parts of Asia with a gap coming in from the African continent. This research study posits that it will be of great significance to fill this research gap to make African countries more competitive as well as increase the ease of doing business in Africa.

2.4 Research Gaps

As earlier discussed, there exist geographical, population, empirical, contextual, and conceptual gaps in the studies that focus on the influence of national culture and innovativeness in Africa. This is primarily because these variables have been thinly evaluated. Furthermore, preliminary studies have focused on the global and European picture thus unable to offer an in-depth analysis of the same on the African context. Below is a summary of the research gaps identified that this study sought to be addressed.



Table 2.1: Research Gaps

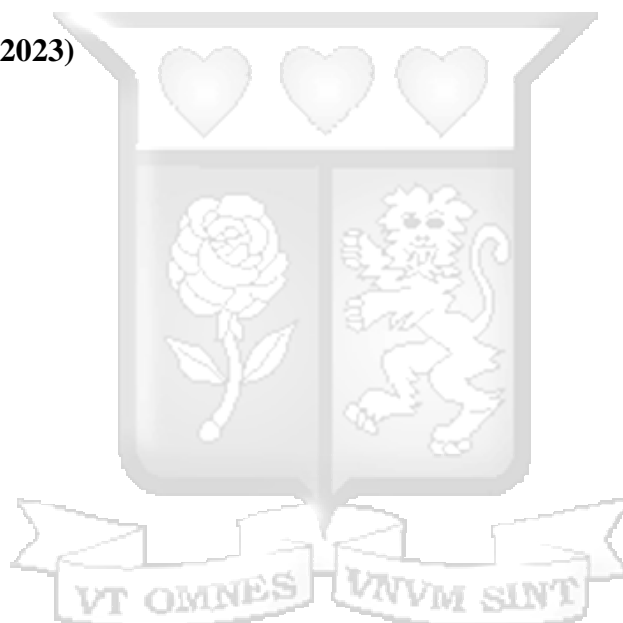
Author	Study aims	Methodology	Finding	Knowledge gap
Sabir, Hakim & Zalia (2020)	To determine the role of Hofstede's dimensions on the readiness of IoT implementation in Saudi universities.	Questionnaire responses measured using a Likert scale.	That culture has an impact on implementation of IoT applications. Culture increases our knowledge about the different orientations proposed by Hofstede and their related impact on IoT implementation.	Contextual gap as the study was limited to Saudi Arabian Universities. Population gap (Small sample population.) Methodology gap (focus on university students)
Cox and Khan (2017)	To assess the impact of country culture on national innovation.	Correlation analysis & step wise regression analysis	That cultural dimensions do influence the decisions that affect the innovation capabilities of a country.	Contextual gap. Empirical gap (missing values for some countries) Knowledge gap (Whether the relationship between culture and innovation may have implications for

				organizational culture)
Gullen and Deckert (2021)	To determine the cultural influence on innovativeness – links between the culture map & Global Innovation Index.	Empirical	That the exchange of ideas enhances innovation and new inventions. In cultures where decisions are made in a consensual way, superiors have trust in their employees and therefore give them space for creativity and innovation.	Contextual gap Methodology gap
Barbosa, Ramirez and Paramo (2022)	To determine the effect of cultural orientations on country innovation.	Empirical i.e Time series analysis using databases	that countries with a performance-oriented culture have the highest innovation inputs associated with an increasing innovation trajectory	Contextual gap Methodology gap
Barbosa, Paramo and Criado (2021)	To determine Hofstede's cultural dimensions as a	Empirical	That cultural dimensions have a direct impact on the way in which	Contextual gap in the sense that the study was based in

	<p>moderator of the relationship between ambidextrous learning and corporate sustainability in born global firms.</p>		<p>the born global firms face demands from the market.</p> <p>The cultural context will stimulate the approach of practices that are legally & socially accepted for the generation of profitability.</p>	<p>Mexican born global firms.</p>
<p>Everdingen and Waarts (2003)</p>	<p>To examine the effect of national culture on the adoption of innovations.</p>	<p>Empirical</p>	<p>That variables describing national culture have a significant influence on the country adoption rates.</p> <p>Within Europe, large cultural differences exist that substantially affect the adoption of innovations.</p>	<p>Contextual as it was on a small sample of ten European countries.</p> <p>Population gap</p>
<p>Andrijauskiene and Dumciuviene (2017)</p>	<p>To determine the impact of Hofstede's cultural dimensions on</p>	<p>Empirical</p>	<p>Confirmation that innovation performance in the European</p>	<p>Contextual gap as the study was domiciled in the EU.</p>

	national innovation level.		Union is culture-specific.	Population gap
Moonen (2017)	To determine the impact of culture on the innovative strength of nations.	Empirical	Strong positive relation between several cultural characteristics of select European countries and their innovative strength.	Contextual – a sample of select European countries. Population gap

Source: Researcher (2023)



2.5 Conceptual Framework

This is a visual representation of the study variables or concepts of interest and the presumed relationships between them. According to (Kimani, 2022) the conceptual framework is a representation of what a researcher believes best explains the natural progression of the phenomenon under study. The conceptual framework is linked with the concepts, important theories and empirical research used in promoting and passing across the knowledge envisioned by the researcher.

Therefore, the conceptual framework for this study is represented in figure 2.1 below. The independent variables are time orientation (LTO), masculinity vs. femininity (MAS), and indulgence vs. restraint (IND) whereas the dependent variable is national innovativeness. It is pertinent to note that the independent variable could induce a change in the dependent variable.

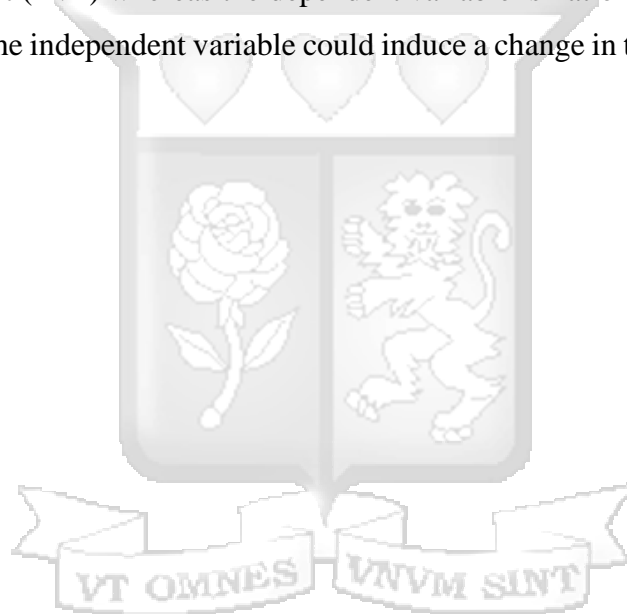


Figure 2.1: Conceptual framework

Independent variables

National culture

Long-term vs. short-term orientation (LTO)

- Work emphasis
- Firm performance
- Ties to tradition

Masculinity vs. femininity (MAS)

- Basis of rewards
- Firm size
- Tolerance for errors

Indulgence vs. restraint (IND)

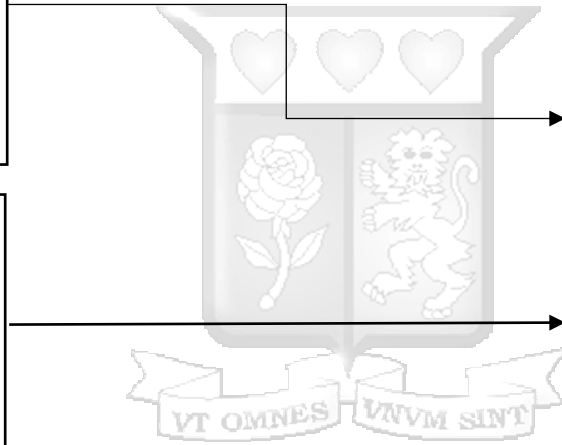
- Freedom
- Orderliness
- Gratification

Dependent variable

National Innovativeness

National Innovativeness

- Innovation inputs (institutions, human capital & research, market & business sophistication, worker knowledge)
- Innovation outputs (scientific & creative outputs)



Source: Researcher (2023)

From the conceptual framework above, this research study expects a relationship to exist between the variables of time orientation, masculinity vs. femininity, indulgence vs. restraint and innovativeness.

2.6 Operationalisation of Study Variables

In this section, this research study operationalised both the independent and dependent variables under study.

It is prudent to note that long term-oriented societies take a long-term approach and focus on the future. Henceforth, the same focus on modern education and less on time honored traditions to prepare for the future whereas the reverse is true for the short-term oriented societies.

Indulgence (IND) represents a society that allows free fulfillment of human needs, enjoying life and having fun. Lower scores represent a society governed by strict norms that believes in suppressing gratification (restraint).

High scores on Masculinity (MAS) represent a society that is focused on achievement, competition, and assertiveness, while lower scores suggest a cooperative society focused on relationships and quality of life.

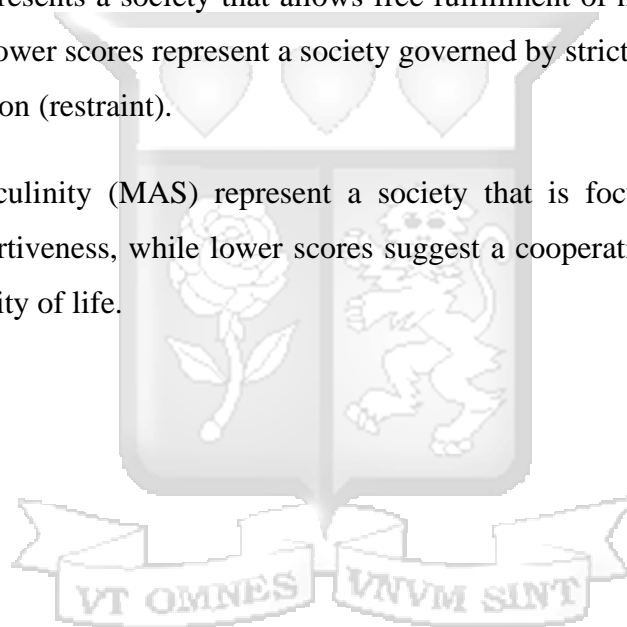


Table 2.2: Operationalization of the study variables

Type of variable	Construct	Variables	Data collection/ Measurement scale	Supporting Literature.
Independent (predictor)	Long-term vs. short-term orientation (LTO)	Work emphasis (persistence vs. quick results) Firm performance (Market position vs. bottom line) Ties to tradition (strong vs. weak)	Hofstede's cultural dimensions (LTO index)	Hofstede, Hofstede & Minkov (2010), Hofstede (2015), Minkov (2013), Michael (2007)
Independent (predictor)	Masculinity vs. femininity (MAS)	Basis of rewards (equity vs. equality) Firm size preference (large vs. small) Tolerance for errors (high vs. low)	Hofstede's cultural dimensions (MAS index)	Hofstede, Hofstede & Minkov (2010), Hofstede (2015), Minkov (2013), Michael (2007)
Independent (predictor)	Indulgence vs. restraint (IND)	Freedom (absolute vs. moderate) Orderliness (low vs. high priority) Gratification (high vs. low)	Hofstede's cultural dimensions (IND index)	Hofstede, Hofstede & Minkov (2010), Hofstede (2015), Minkov (2013), Michael (2007)
Dependent (criterion)	National innovativeness	Innovation inputs (institutions, human capital & research, infrastructure, market & business sophistication, worker knowledge) Innovation outputs (scientific and creative outputs)	Global Innovation Index overall score.	(GII, 2022), (Global Innovation Index, 2022)

Source: Researcher (2023)

2.7 Chapter summary

Chapter two of this research study has reviewed theoretical literature in regard to the theory of the competitive advantage of nations to underpin the variable of national innovativeness and game theory to underpin the variable of national culture, empirical review, research gap and conceptual framework of the culture and national innovativeness variables which are under study. The theory of Competitive Advantage of Nations states that national prosperity is created, not inherited. A nation's competitiveness depends on the capacity of its industry to innovate and upgrade (Porter, 1990). Game theory could be formally defined as a theory of rational decision in conflict situations (Bhuiyan, 2016). Bhuiyan (2016) states that game theory is the study of how players should rationally play games. Hofstede's work has been criticized as having limitations/ gaps by several scholars like Peterson and Smith (2008) in Minkov (2013) who identified three main kinds of critiques of the use of nations as units of cross-cultural comparisons as elucidated herein. Despite these criticisms, Hofstede's work on culture is the most widely cited when explaining national culture, values and culture (Bond as cited in Michael, 2007). Michael (2007) argues that Hofstede's observations and analysis provide scholars and practitioners with a highly valuable insight into the dynamics of cross-cultural relationships. Bhagat and McQuaid (1982) (as cited in Michael, 2007) state that undoubtedly, the most significant cross-cultural study of work-related values is the one carried out by Hofstede. As earlier discussed, there exist geographical, population, empirical, contextual, and conceptual gaps in the studies that focus on the influence of national culture and innovativeness in Africa. This is primarily because these variables have been thinly evaluated. Furthermore, preliminary studies have focused on the global and European picture thus unable to offer an in-depth analysis of the same on the African context.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research methodology the study adopted. It explains the research design, population and sampling method, data collection process as well as the data analysis methods. The chapter also dwells on the quality, validity, reliability, and objectivity of the research as well as the ethical considerations adopted by the research study.

3.2 Research Philosophy

Sekaran and Bougie (2013) defined research philosophy as a belief about how to gather, analyse and apply data about a given phenomenon under study. The debate was further expounded by Creswell (2014) stating that research philosophies consist of pragmatism, positivism, interpretivism, realism and constructivism. According to Hale (2020) realism is the viewpoint which accords to things which are known or perceived anyone is thinking about or perceiving them whilst pragmatism argues that ideas and notions are just pertinent where they reinforce action (Kelemen, 2008). Bajpai (2011) as cited in Kimani (2022) defines positivism as a philosophical system in which an observable social reality is used to provide law-like generalizations whereas constructionism looks at the world as having been created internally using constructs, or internal models (Ackermann et. al., 2009) as cited in Kimani (2022).

This research study was guided by positivism research philosophy given that it is scientific in nature, and it attempts to explain how cultural orientations influence innovativeness, which is a measure of performance. It is also prudent to note that pragmatism and positivism are not mutually exclusive because they both are anti-dogmatic, claim that philosophy is a method rather than theory and treat the British empiricists as their forerunners (BRM, 2021). Positivism philosophy argues that knowledge is objective and free from biases resulting from a researcher's values and beliefs (Ryan, 2018). Positivism emphasizes objectivity by proving or disapproving hypotheses and it arises from the foundationalism and empiricism philosophies. Foundationalism posits that hypotheses should be proven through value-free, controlled experiments or observations and ought to result in an indisputable fact through science. Bryman (2008) as cited Kimani (2022) states that empiricists argue that knowledge is considered to be

true when a hypothesis has been proven by subjecting something to repeated tests and producing the same results in each time.

3.3 Research Design

Trochim (2006) as cited in Kimani (2022) defines research design as a blueprint that guides the study. Research design consists of explanatory, descriptive, and exploratory research designs. Pertinent to note is that this was quantitative research, adopting a pure research application. This research study adopted both descriptive and explanatory research designs because it was a quantitative, pure research application.

According to Rahi (2017), descriptive research is aimed at obtaining information on the current state of a phenomenon and therefore provides an accurate profile of events, situations or people. Descriptive research design was used to provide a narrative of key aspects of Hofstede's cultural orientations and national innovativeness in select African countries. Prim (2016) states that Hofstede's database considers 94 countries, although there is no definition as to the period of the data collection, however this is a measure of national culture and so this information does not stop the data being useful. Both indices have a limited number of points between 0 and 100 for each country Prim (2016).

Explanatory research design focuses on finding out the extent and the nature of cause-and-effect relationships existing between two or more variables (Kimani, 2022). This research study used explanatory research design to estimate the influence of Hofstede's cultural orientations on national innovativeness in select African countries.

To measure the relationships, the three national culture dimensions of Hofstede et al. (2010) which are LTO, MAS & IND were employed as independent variables whereas national innovativeness was represented by the GII overall score as the dependent variable.

3.4 Population of the study

Saunders et. al. (2019) as cited in Kimani (2022) defines population as the full set of cases or elements to be studied/ analysed. The African Union is made up of fifty-five (55) member states which represent all the countries on the African continent AUC (2023). The population of this study was all African countries.

3.5 Sample Design and size

Creswell (2014) states that the sample design provides a framework to be utilized to choose the sample for the research based on the required sample size. The quality of a piece of research stands or falls not only by the appropriateness of methodology and instrumentation but also by the suitability of the sampling strategy that has been adopted (Morrison, 1993) as cited in (Cohen, Manion and Morrison, 2007). Kimani (2022) argues that a sample design comprises of the following: sample frame, sampling technique and sample size. Oladipo (2015) as cited in Kimani (2022) states that a sampling frame is a comprehensive list of the population of study. Therefore, the sampling frame for this study was made up of fifty-five (55) member states which represent all the countries on the African continent (AUC, 2023). Cooper and Schindler (2010) as cited in Kimani (2022) define sample size as the number of participants or observations to be included in a sample. Therefore the sample size of this study was the eight select African countries. See Appendix III. This is explained in the sampling technique below.

3.5.3 Sampling Technique

Sampling technique as a method of selecting a sample to represent the population of the study (Lewis and Thornhill, 2012) as cited in Kimani (2022). This research study deployed the purposive non probability sampling technique to select the eight African countries.

The inclusion criteria was African countries whose data appears on on the Global Innovation Index reports from 2011 to 2022 as well as those countries whose data is captured Hofstede's cultural dimensions' indices (2015) of time orientation, masculinity versus femininity, indulgence versus restraint. Through this, the researcher selected countries to represent East and West African regions of Africa. See Appendix III.

3.6 Data collection methods

This research study used secondary data collected from the 2011 to 2022 published reports of the Global Innovation Index (GII) as well as Hofstede's cultural orientation indices (LTO, MAS, IND) of 2015. Pertinent to note is that the Global Innovation Index is an annual country ranking regarding the innovation capabilities. It is a robust and rigorous statistical benchmark that uses ninety-one (91) indicators. Hofstede's cultural dimensions remain an authority in the scholarship of culture given its clarity, wholesomeness, and attention to detail. Given that

cultural values tend to change after a long period of time, the study used the latest scores (2015) to be extracted from their website Hofstede (2015).

Several studies have used this methodology although contextual and population gaps came into play. In a research study to assess the impact of country culture on national innovation, Cox (2017) used correlation analysis and step wise regression analysis. The same can be said of Moonen (2017), Andrijauskiene (2017), Strychalska (2015), and Kaasa (2010) among others.

3.7 Tests of Statistical Assumptions

This research study carried out three pre-estimation diagnostics before model estimation to ensure that the selected variables are fit to be included in the model to be estimated.

3.7.1 The Test for Multicollinearity using pairwise correlation

Multicollinearity is an econometric problem that exists whenever an independent variable is highly correlated with one or more of the other independent variables in a multiple regression equation. The presence of multicollinearity in a model undermines the statistical significance of the affected variables. To test for multicollinearity, this study first generated a correlation matrix between the independent variables.

Table 3.1: Pairwise correlation analysis results (A)

	1	2	3	4	5	6	7
Global Innovation Index (1)	1.0000						
Power Distance (2)	-0.1437	1.0000					
Individualism(3)	0.1437	-1.0000*	1.0000				
Masculinity (4)	-0.1437	1.0000*	-1.0000	1.0000			
Uncertainty Avoidance (5)	-0.1437	1.0000*	-1.0000	1.0000*	1.0000		
Time Orientation (6)	-0.1522	-0.5825*	0.5825*	-0.5825*	-0.5825*	1.0000	

Indulgence vs Restraint (7)	0.0569	0.2751*	-0.2751*	0.2751*	0.2751*	-0.6903	1.0000
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* Indicates significance at 0.05 level.

Source: Researcher’s computation using secondary data

The results show the correlation coefficients between the Global Innovation Index (GII) and six cultural dimensions, namely Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Time Orientation, and Indulgence vs Restraint. The diagonal entries show the correlation of each variable with itself, which is always 1. The correlation matrix indicates that there may be some multicollinearity among the independent variables, therefore including such variables together in the same model would lead to unreliable results.

The findings from this test show that there is a strong negative correlation (-1.0000) between Power Distance and Individualism, which suggests that these two variables may be measuring similar cultural dimensions. Similarly, there is a strong positive correlation (1.0000) between Masculinity and Uncertainty Avoidance, which may also suggest some overlap in what these variables are measuring. Multicollinearity can be problematic in regression analysis because it undermines the statistical significance of an independent variable hence making it difficult to estimate the unique contribution of each independent variable to the dependent variable. In addition, it can inflate the standard errors of the coefficients, which can make it difficult to assess the statistical significance of the results.

The research study dropped some of the independent variables with very strong correlation coefficients so as to have a reliable model. The dropped variables were power distance, uncertainty avoidance as well as individualism versus collectivism and the retained variables were long term versus short term, masculinity versus femininity and indulgence versus restraint.

3.7.2 Variance Inflation Factor Test

The study further carried out a multicollinearity test using the Variance Inflation Factor (VIF) to rule out multicollinearity. The Variance Inflation Factor is a measure used to assess the degree of multicollinearity among the independent variables in a regression model. VIF measures how much the variance of the estimated regression coefficients is inflated due to multicollinearity. The results are presented below.

Table 4.4: VIF Results

Variable	VIF	1/VIF
Time orientation	2.74	0.364785
Indulgence vs Restraint	1.99	0.503481
Masculinity	1.56	0.642717
Mean VIF	2.94	

Source: Researcher’s computation using secondary data

The mean VIF for all the variables is below 5, which is generally considered an acceptable level of multicollinearity. The VIF values for all the variables are also below 10, which further supports the absence of severe multicollinearity. Having no severe multicollinearity is important because severe multicollinearity can affect the accuracy and reliability of the regression coefficients and standard errors, which can lead to incorrect inferences and conclusions. The results showed that there was no severe multicollinearity in the model hence proceeding to run random effects regression model.

3.7.3 The Breusch and Pagan LM test

This research study also carried out a Breusch & Pagan LM test for random effects to check for the variability in the innovativeness between different countries. The Breusch-Pagan Lagrange Multiplier Test is used to determine whether random effects are significant in panel data models. The results from these tests are presented below.

	Var(u) = 0
Breusch & Pagan LM random effects test	chibar2(01) = 0.21
	Prob > chibar2 = 0.0325

Notes: No. of obs = 94. No. of groups = 8.

Source: Researcher’s computation using secondary data

Var (u) = 0 means no significant unexplained variability. Chi bar2 (01) measures the overall significance of the random effects and 0.21 shows that a certain portion of the variable is due to the random effects. Prob>chi bar 2 = 0.0325 is significant at 5%.

The Breusch and Pagan LM test for random effects indicates that there is no evidence of significant unexplained variation at the group level. This implies that the assumption of no

significant unexplained variation at the group level is met. This means that the random effects model is appropriate for the data, and that the variability in innovation levels between different countries is captured by the random effects component of the model.

3.7.4 The Wald Test

The Wald test (also called the Wald Chi-Squared Test) is a way to find out if explanatory variables in a model are significant (Glen, 2023). “Significant” means that they add something to the model; variables that add nothing can be deleted without affecting the model in any meaningful way. The test can be used for a multitude of different models including those with binary variables or continuous variables. It helps us know whether national culture has an influence on national innovativeness. Prob>chi2 is significant at 1% meaning we can go ahead to run a random effects regression model. See table 4.5.

3.8 Data analysis

Secondary data analyses can be conducted using only published descriptive statistics as data (Nimon, 2015). Secondary data collected from Hofstede’s cultural dimensions index and from the Global Innovation indices of 2011 to 2022 was entered into STATA statistical package, version 14 software. The study used both descriptive and inferential data analysis techniques to test the relationships. Descriptive analysis makes use of numbers and graphs to organize and summarize data. The graphs include frequency tables, graph and charts to present crucial information. Pertinent to note is that the inferential analysis consists of correlation analysis. It is pertinent to note that the dataset in this research study is discontinuous, multiple, large, panel.

The study tested for pairwise correlation coefficient and random effects regression model to assess the relationship between variables. Correlation is a measure for checking the degree of relationship between two variables, which can indicate a simultaneity relationship between them (Loesch, 2012). Correlation derives from levels of correlation intensity (Prim, 2016).

This research study used pairwise correlation coefficient. The strength of the relationship between variables in the study was tested. Pairwise correlation values range between -1 and 1 with values close to one indicating a perfect relationship and values close to zero indicating no relationship between variables. Regression was also used as a statistical technique for evaluating the association coefficient between the independent variables on the dependent variable, in other words, the degree of alteration of the dependent variable as a response to the independent variables (Hair et. al., 2009). Therefore, this technique enables an analysis to be

made of what contribution each dimension of the national culture makes to the innovation outputs Prim (2016).

This research study conducted correlation analysis between the dependent variable; innovativeness, as well as the independent variables; time orientation, masculinity versus femininity, indulgence versus restraint. The objectives were analysed using pairwise correlation and random effects regression analysis to assess their relationship. Random effects regression model was used as the primary analysis tool due to its ability to show the relationship (positive or negative) as well as its strength.

3.9 Research Quality

Majority scholars agree that research quality is an important aspect of any research design. The research quality determines how the evidence and conclusion made will stand up to the toughest scrutiny. To ensure that the research instrument meets the minimum threshold of data quality, the research study verified the validity, reliability and practicability of the indices.

3.9.1 Validity

Validity can be defined as the extent to which an instrument/questionnaire measures what it purports to measure. Validity consists of construct, content, and criterion validity. The study will test for content, criterion and construct validity by requesting experts for guidance on how to go about it. Validity must be faithful to its premises and positivist research has to be faithful to positivist principles, for example; controllability, replicability, predictability, the derivation of laws and universal statements of behaviour, context-freedom, fragmentation and atomization of research, randomization of samples, observability (Cohen et. al, 2007).

This research study carried out careful sampling of items required to ensure their representativeness thus ensuring content validity. This was done using purposive non-probability sampling technique. Criterion related validity endeavours to relate the results of one particular instrument to another external criterion (Cohen et al, 2007). This research study ensured validity through avoiding subjective interpretation of data, selecting an appropriate time scale as well as methodology for answering the research questions.

3.9.2 Reliability

Reliability refers to the measure of consistency and the ability to replicate an earlier research design by achieving the same findings in a repeat study. Cohen et. al, (2007) states that reliability in quantitative research is essentially a synonym for dependability, consistency, and replicability over time, over instruments and over groups of respondents. Correlation coefficients can be calculated for the reliability of pretests and post-tests. To guarantee reliability, the study ensured a reduction of measurement errors during data collection as well as a Variance Inflation Factor (VIF) to rule out multicollinearity among the independent variables in a regression model.

3.10 Ethical Considerations

The research study observed ethical concerns in handling of research data, responsibility in data collection and analysis, maintaining integrity, respect and accountability to the publisher / copyright holders as well as responsibility in reporting the research findings. The study where necessary sought consent from the copyright owners prior to data collection and guarantee confidentiality of the owners' identity where necessary.

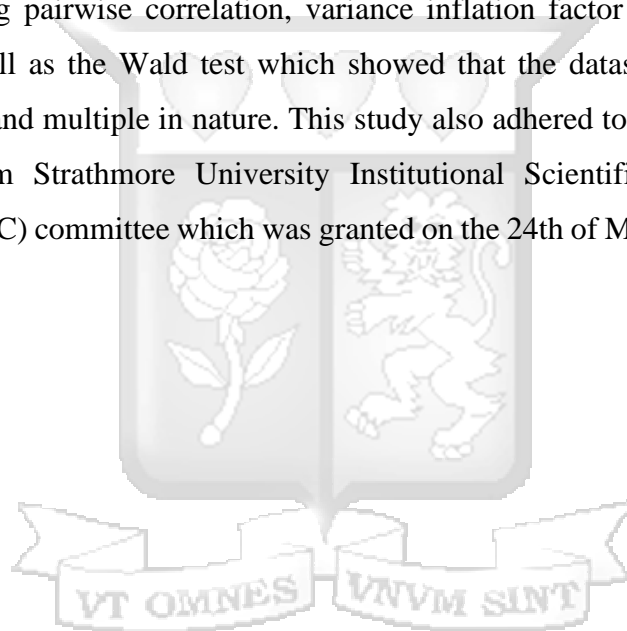
Confidentiality of the respondents/ owners was observed by protecting personal identifiable information by use of secure databases and password protected records. The research study sought to inform the owners/ respondents about the objectives of the research before their participation in data collection to avoid exerting any pressure on them. The research study strived to avoid conflict of interest and sought to be as objective as possible in data collection and analysis.

Objectivity was ensured during data collection, analysis and reporting. The study observed integrity and intellectual honesty during data collection, measurement, analysis and reporting on research findings. The study also observed transparency in reporting to avoid potential conflict of interest, observe mutual respect and responsibility in dealing with third party enumerators or other research teams by accurately representing the contribution to research proposals and reports. The research study further sought approval from Strathmore University Institutional Scientific & Ethical Review Committee (SU-ISERC) committee which was granted on the 24th of May 2023. See appendix IV.

3.11 Chapter Summary

This chapter has delved into the methodology that this research study employed. The study employed positivism research philosophy, descriptive and explanatory research designs because it was a quantitative, pure research application. The population of the study was the fifty-five members of the African Union (55). This research study deployed the purposive non-probability sampling technique to select the eight African countries. The inclusion criteria was African countries whose data appears on the Global Innovation Index reports from 2011 to 2022 as well as those countries whose data is captured Hofstede's cultural dimensions' indices (2015) of time orientation, masculinity versus femininity, indulgence versus restraint.

The study carried out four tests of statistical assumptions and these were the test for multicollinearity using pairwise correlation, variance inflation factor test, the Breusch and Pagan LM test as well as the Wald test which showed that the dataset was discontinuous, random, large, panel and multiple in nature. This study also adhered to quality and ethics and sought approval from Strathmore University Institutional Scientific & Ethical Review Committee (SU-ISERC) committee which was granted on the 24th of May 2023. See appendix IV.



CHAPTER FOUR

DATA PRESENTATION AND INTERPRETATION OF FINDINGS

4.0 Introduction

This chapter presents the results of the study and their interpretations. Descriptive as well as inferential analyses are presented following the objectives of the study as earlier stated.

4.1 Data Description

This research study collected secondary data from Hofstede's Cultural Dimensions Index 2015 as well as the Global Innovation Index reports from 2011 to 2022. This research study targeted eight African countries whose data was readily available on both indices taking into consideration the variables under study. It is pertinent to note that the dataset in this research study is discontinuous, multiple, large, panel data. In a research study into the differences between national culture, Hofstede et al. (2010) identified five dimensions by which one national culture might differ from another: power distance, uncertainty avoidance, degree of individualism, its extreme opposite being collectivism, degree of masculinity, its extreme opposite being femininity; short and long-term orientation, degree of indulgence, its extreme opposite being restraint/ repress.

Long-term versus short term orientation, one of the dimensions refers to the temporal tolerance (patience) that individuals of a culture have for obtaining success and results (Hofstede et al. 2010). Degree of masculinity (masculinity versus femininity) is another dimension advanced by Geert Hofstede measures how much individuals in a particular culture value "doing" or "execution" rather than observation and reflection, the latter two being characteristics of the femininity of the culture (Hofstede et al., 2010). Degree of indulgence (Indulgence versus restraint) is also a dimension that Hofstede advanced to explain national culture. This measure evaluates by how much the individuals of a particular culture control their impulses and desires.

The Global Innovation Index (GII) is an annual worldwide ranking of countries by their ability for and success in innovation, published by the World Intellectual Property Organization (GII, 2022). The aim of the GII is to provide insightful data on innovation, to track major innovation developments at the country and regional level and, in turn, to assist policymakers in evaluating their innovation performance and making informed innovation policy decisions (Global Innovation Index, 2022). The current study used the overall GII average score, which is an

average of the input and output sub-indices to establish the influence of national culture on national innovativeness.

4.2 Descriptive Statistics of the Study

Secondary data analyses can be conducted using only published descriptive statistics as data (Nimon, 2015). Descriptive statistics were summarized to provide a general account of the data characteristics. Secondary data analysis can be conducted using only published descriptive statistics as data (Nimon, 2014). This helped to ensure that the data was good for estimation otherwise it would produce misleading results. In particular, a summary of the mean, minimum, maximum and standard deviation values was computed. The data was processed and analyzed using STATA statistical package, version 14.

4.2.1 Summary Statistics of Study Variables

The summary statistics of the study variables are presented in table 4.1 below outlining the mean, maximum values, minimum values and the standard deviations.

Table 4.1: Summary of study variables

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
National Innovativeness	94	24.53628	3.852016	14.2	32.48
Power Distance	96	70.5	6.534121	64	77
Individualism vs Collectivism	96	23.5	3.518373	20	27
Masculinity vs Femininity	96	43.5	2.513123	41	46
Uncertainty Avoidance	96	53	1.005249	52	54
Long term vs Short term	96	21.5063	9.51196	3.526448	34.00504
Indulgence vs Restraint	96	48.88616	19.56762	18.08036	83.92857

Source: Stata Statistical Package, version 14

The main purpose of the summary statistics was to establish the goodness of fit of the observed data. The results show smaller standard deviations compared to mean values of the variable. This implies that the observed data converges around the means and is therefore highly representative of the reality on ground. On individual merit however, the standard deviation of each variable are greater than 1 which indicates variability across the countries. This is the reality of the cultural environment surrounding innovation on the African continent.

4.3 Inferential Statistical Analysis

Secondary data analyses can be conducted using only published descriptive statistics as data (Nimon, 2015). Inferential analysis consists of correlation analysis. It is pertinent to note that the dataset in this research study is discontinuous, multiple, large, panel.

4.3.1 Correlation Analysis

Correlation is a measure for checking the degree of relationship between two variables, which can indicate a simultaneity relationship between them (Loesch, 2012). Correlation derives from levels of correlation intensity (Prim, 2016).

This research study used pairwise correlation coefficient. The strength of the relationship between variables in the study was tested. Pairwise correlation values range between -1 and 1 with values close to one indicating a perfect relationship and values close to zero indicating no relationship between variables. The study tested for pairwise correlation coefficient because of the nature of the dataset being discontinuous, multiple, large, panel.

Table 4.2: Pairwise correlation analysis results (B)

	National Innovativeness	Masculinity vs femininity	Long vs short term	Indulgence vs Restraint
National Innovativeness	1.0000			
Masculinity vs femininity	-0.1437	1.0000		
Long vs short term	-0.1522	-0.5825	1.0000	
Indulgence vs restraint	0.0569	0.2751	-0.6903	1.0000

Source: Stata Statistical Package version 14.

After dropping power distance, individualism and uncertainty avoidance, the study evaluated the correlation between the remaining study variables as presented in the above table. The correlation coefficients are all lower than 0.8 and therefore indicate that there is no threat for severe multicollinearity in the model to be estimated.

4.3.2 Findings from the Inferential and Descriptive Statistics

The results show that masculinity versus femininity has a negative correlation with NI (-0.1437), suggesting that cultures with more masculine values may have lower levels of innovation. Long term versus short term orientation also has a negative correlation with NI (-0.1522), although the correlation is weaker than that between masculinity versus femininity

and NI. This suggests that cultures that place a greater emphasis on the present may have lower levels of innovation, although this effect may be less pronounced than the effect of masculinity versus femininity. Indulgence vs Restraint has no correlation with national innovativeness (0.0569).

Looking at the correlations among the independent variables, there is a negative correlation between time orientation and indulgence vs restraint (-0.6903), suggesting that cultures that are more future-oriented may be less indulgent. There is also a positive correlation between masculinity and indulgence vs restraint (0.2751), although the correlation is weaker than the correlation between masculinity and NI.

4.4 Regression Results

The study proceeded to run a random effects regression model as shown below. This is because of nature of the dataset i.e discontinuous, multiple, large, panel data hence necessitating the use of random effects regression model that uses both within and between information, estimates the coefficients of time-invariant covariates as well as being more efficient than fixed effects model under the null hypothesis.

Table 4.4: Regression Results

Dependent Variable: National Innovativeness (NI)			
Independent Variables	Coefficient	Std. Error	P> t
Masculinity vs Femininity	-0.5770785***	0.0693104	0.000
Long term vs Short term	0.2040232***	0.0666488	0.002
Indulgence vs Restraint	-0.0359253**	0.0172465	0.037
Constant	55.7886***	3.394097	0.000
sigma_u	0.80069498		
sigma_e	3.6313785		
Rho	0.04636328 (fraction of variance due to u_i)		
	within = 0.0000		
R-square	between = 0.6671		
	overall = 0.1188		
Wald chi2(3)	94.14		
Prob > chi2	0.0000		

$$\text{corr}(u_i, X_i) = 0$$

Notes: No. of obs = 94. No. of groups = 8.

Source: STATA Statistical Package, version 14.

This regression model aims to explain the variation in national innovativeness (NI) using the three independent variables of long term versus short term, masculinity versus femininity, and Indulgence vs Restraint. The regression analysis is based on panel data, with 94 observations and 8 groups.

4.4.1 Findings from the Random Effects Regression Model.

The results show that all three independent variables are statistically significant at the 5% level. A unit increase in masculinity vs femininity is associated with a 0.577 decrease in the NI, while a unit increase in long term vs short term is associated with a 0.204 decrease in the NI. A unit increase in indulgence vs restraint is associated with a 0.036 decrease in the NI. The constant term is also statistically significant, with a coefficient of 55.789. This indicates that when all independent variables are equal to zero, the predicted value of NI is 55.789.

The R-square values indicate that the model explains about 11.8% of the variations in the dependent variable. This relatively low value indicates that there so many other factors that explain innovation other than the ones considered in this study. The higher between-group R-square value (0.6671) indicates that the variation in the NI is more driven by differences between groups (countries in this case) rather than within-group (over time). This suggests that there are systematic differences in innovation levels between different countries, and that these differences may be related to factors such as, institutions, or economic development. The Wald chi2 test shows that the model as a whole is statistically significant, with a chi2 value of 94.14 and a p-value of 0.000.

The negative coefficients for the two independent variables suggest that higher values of masculinity versus femininity and indulgence versus restraint are associated with lower values of the GII. The positive coefficient for the independent variable of long term versus short term suggests that higher values of the same is associated with lower values of the GII. This implies that countries with more masculine, indulgent, and short-term-oriented tend to have lower levels of innovativeness. The findings of this study also imply that African countries with long term, feminine, restraint cultural orientations tend to have higher levels of national

innovativeness. However, it is important to note that these variables alone cannot fully explain the complex and multifaceted nature of innovation, and other factors may also play a role.



CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter of the study discusses the findings in the previous chapter and makes conclusions based on the objectives. The chapter also gives policy recommendations from the study findings.

5.1 Summary of the study.

This research study can best be summarized in the following way. Strategy is the determination of the basic long-term goals of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals (Chandler, 1962). Johnson, Scholes and Whittington (2008) define strategy as the direction and scope of an organization over the long term, which achieves advantage in a changing environment through its configuration of resources and competences with the aim of fulfilling stakeholder expectations. Corporate strategy according to Lynch (2006) can be described as the identification of the purpose of the organization and the plans and actions to achieve that purpose. Culture is about that which is taken for granted but none the less contributes to how groups of people respond and behave in relation to issues they face (Johnson et. al., 2008). Strychalska (2015) states that culture shapes the way people think about and behave in regard to taking risk, perception of opportunities, and the nature of entrepreneurial activity and, therefore, economic creativity and economic outcomes and it goes further to suggest that culture is a vital factor because countries differ substantially in regard to values, traditions, behaviours and norms which in turn could also affect innovativeness of a nation.

Strategy scholars agree that culture drives strategy and that strategy is concerned with organizational performance. It is also prudent to note that this was strategic management research, which simply is a domain of social science that is concerned with explaining and predicting differences in organisation outcomes i.e performance. Thus, knowledge of the cultural orientations of the people in a given market can help business and corporate leaders to design the appropriate frameworks and operating procedures so as to increase innovativeness not only within companies but countries as well. It is critical to note that organizations do not operate in a vacuum. A nation's competitiveness depends on the capacity of its industry to innovate and upgrade (Porter 1990). Prim (2016) states that innovation is a driver for the

economic progress and competitiveness of both developed and developing economies. In a world of increasingly global competition, nations have become more, not less, important (Porter, 1990). However, developing countries face genuine obstacles to innovation and this is precisely why they remain underdeveloped (Aubert, 2004). The situation is, however, rendered more complicated because the “developing world” presents very diverse situations in terms of levels of development, culture, e.t.c (Aubert, 2004). Therefore, this research study sought to determine the influence of the cultural dimensions of long-term versus short-term orientation, masculinity versus femininity, indulgence versus restraint on national innovativeness in select African countries. The study was anchored on the theory of Competitive Advantage of Nations as well as Game Theory. Secondary data was collected from Hofstede’s cultural dimensions framework as well as from the Global Innovation Index.

This research study utilized Pairwise correlation coefficient and random effects regression analysis to rank Hofstede’s cultural dimension scores of time orientation, masculinity versus femininity and indulgence versus restraint against the Global Innovation Index scores (GII) for the select African countries whose data was readily available on both indices so as to determine the influence of national culture on national innovativeness in select African countries. The data was processed and analysed using STATA statistical package, version 14. The findings are discussed henceforth in this chapter.

5.2 Discussion of the findings

This study set out to achieve three major objectives which were to establish the individual effects of cultural dimensions on innovation. The results are discussed below.

5.2.1 Long-term versus short-term (LTO) cultural dimension and national innovativeness

The first objective was to establish the influence of long-term versus short-term (LTO) cultural dimension on national innovativeness. Long-term versus short-term orientation, was found to have a positive and significant effect on the GII at a 5% significance level. This implies that countries with a long-term orientation tend to have a higher GII score compared to those with a short-term orientation which fosters aspects such as quarterly reporting, short term performance, bottom line, quick results as a way to increasing national innovativeness. One possible reason for this is that a long-term orientation may lead to a focus on stability, thrift, firm survival, and tradition, rather than disruption and risk-taking spending on research and development whereas short-term orientation may encourage more experimentation, disruption,

risk tolerance, and innovation as a way of achieving quick success and satisfying the ever-changing customer needs and challenges.

The results of this research study are consistent with previous research, such as the work of Trompenaars and Hampden-Turner (2008), which suggests that a long-term orientation may be associated with a more conservative and risk-averse approach to innovation. The results of this study are also consistent with those of Cox (2017), which was a research study done to assess the impact of country culture on national innovation using correlation analysis and step wise regression analysis on a sample size of ninety six countries. The findings in that study suggested that perseverance is related to innovation but planning for the future is not (Cox, 2017).

A research study to determine the relationship between national culture dimensions and the degree of innovation based on a sample of seventy-two countries analysed using multiple linear technical regressions, the results reveal the existence of three cultural dimensions associated with innovation outputs (technology and creativity): individualism, long-term orientation and indulgence (Prim, 2016). The same study goes further to state that sustained innovation is influenced by a national culture that prioritises long-term orientation (Prim, 2016).

The findings of this research study are also consistent with the findings of Bukowski and Rudnicki (2018) that state that long-term orientation, and flexibility, the dimensions omitted in the prior studies are positive and strong cultural predictors of national innovation intensity. The said study was done to point out the innovation success of some East Asian countries using empirical analysis.

In a research study to examine the relationships between the different national culture dimensions presented by Hofstede and innovation data by country to analyse which characteristics of national culture dimensions contribute to the country becoming more innovative using multiple linear regression equations as data analysis technique as well as secondary data from Hofstede's national culture database, data on innovation indicators from the Global Innovation Index and population data from the World Bank database, Espig, Mazzini, Zimmermann and Carvalho (2021) found that national culture affects innovation rates positively with the most favourable situation to boost innovation being when there is a low distance from power, high individualism, femininity characteristics, low aversion to uncertainty, long-term orientation and a higher level of indulgence.

The results herein expand on the current knowledge about the relationship between cultural dimensions and innovation in previous studies, such as those by Rinne et al. (2012), as well as Rossberger and Krause (2014), Jang, Ko and Kim (2016).

5.2.2 Masculinity versus femininity (MAS) cultural dimension and national innovativeness

The second objective was to establish the influence of masculinity versus femininity (MAS) cultural dimension on national innovativeness. The results show that masculinity versus femininity has a negative and significant effect on the Global Innovation Index (GII) at a 1% significance level. This implies that countries that have a more masculine culture tend to have a lower GII score compared to those with a more feminine culture. This may be because a more masculine culture is associated with a focus on competition, low tolerance for errors, big firm sizes, rewards based on productivity, hierarchy, and individualism, which can lead to a lack of collaboration and teamwork, hindering innovation. In contrast, a more feminine culture promotes cooperation, tolerance for errors, equitable rewards, small firm sizes, low intensity for errors, inclusivity, and nurturing, which are all important components of innovation. An environment that facilitates information exchange would possibly be more innovative. Collaborative environments are also as a potential for innovation Chesbrough (2003) as cited in Espig et. al. (2021).

In a research study to examine the relationships between the different national culture dimensions presented by Hofstede and innovation data by country to analyse which characteristics of national culture dimensions contribute to the country becoming more innovative using multiple linear regression equations as data analysis technique as well as secondary data from Hofstede's national culture database, data on innovation indicators from the Global Innovation Index and population data from the World Bank database, Espig et. al. (2021) found that national culture affects innovation rates positively with the most favourable situation to boost innovation being when there is a low distance from power, high individualism, femininity characteristics, low aversion to uncertainty, long-term orientation and a higher level of indulgence.

This research results are consistent with previous studies, such as Prim (2016) which states that the smaller the degree of masculinity, the greater the innovation output of the country. This was research study to determine the relationship between national culture dimensions and the

degree of innovation based on a sample of seventy-two countries analysed using multiple linear technical regressions.

The results of this study are also consistent with those of Cox (2017), which was a research study done to assess the impact of country culture on national innovation using correlation analysis and step wise regression analysis on a sample size of ninety-six countries. The findings in that study suggested that Hofstede Masculinity/Femininity dimension and innovation is supportive of prior research that found a relationship and differs from prior research that found no relationship. Feminine cultures may exhibit a preference for cooperative environments that may facilitate innovation.

Hofstede's cultural dimensions theory, which suggests that masculinity is negatively associated with innovation as well as Cox (2017), Madjar et. al (2002) as cited in Prim (2016) who stated that countries with a femininity feature in the masculinity versus femininity dimension tend to have more innovations because more error-tolerance is found in the femininity characteristic.

5.2.3 Indulgence versus restraint (IND) cultural dimension and national innovativeness

The third objective was to establish the influence of indulgence versus restraint (IND) cultural dimension on national innovativeness. The results show that, indulgence versus restraint, has a negative and marginally significant effect on the GII at a 5% significance level. This implies that countries with a more indulgent culture tend to have a lower GII score compared to those with a more restrained culture. One possible explanation for this is that a more indulgent culture may be associated with a low priority for orderliness, instant gratification, absolute freedoms and lack of discipline and focus, determination, which are all important components of innovation. In contrast, a more restrained culture may encourage greater self-control, moderate freedom, orderliness, persistence, discipline and frugality which preserves scarce resources, all of which are important for fostering innovation.

The findings of this research study are also consistent with the findings of Bukowski and Rudnicki (2018). The said study was done to point out the innovation success of some East Asian countries using empirical analysis. The findings show that, apart from individualism, long-term orientation, and flexibility, the dimensions omitted in the prior studies are positive and strong cultural predictors of national innovation intensity, whereas the role of other cultural factors finds little empirical support.

The results of this study are also consistent with those of Novotny, Szeberin, Kovacs, and Mate (2022) that states that BEV consumption is significantly higher in more restrained cultures. Consumers in indulgent cultures may feel that electric cars constrain free travelling because of a lower driving range, longer charging times, and a need for carefully planning routes. Novotny et. al. (2022) was a research paper that examines the impact of Hofstede's six dimensions of national culture on the development of the electric car market using sales data from 2019 and 2020 in 21 OECD countries.

Pertinent to note is that African economies have low disposable incomes and as such it means that their citizens are trapped in consumption expenditure. However, it is important to note that the effect size of this variable is relatively small and marginally significant, suggesting that other factors may have a stronger influence on innovation in these countries.

5.3 Conclusions from the Study

This study set out to achieve three major objectives which were to establish the individual effects of cultural dimensions on national innovativeness. The results suggest that cultural dimensions have a significant impact on innovation, and that countries with more feminine, short-term oriented, and restrained cultures tend to have higher levels of innovation compared to those with more masculine, long-term oriented, and indulgent cultures in Africa. These findings have important implications for policymakers and business leaders who seek to foster innovation in their respective countries. By understanding the cultural dimensions that influence innovation, they can develop policies and strategies that promote a culture of innovation and creativity, ultimately driving economic growth and prosperity. It is pertinent to note though that culture is an elusive lever because much of it is anchored in unspoken behaviours, mindsets, and social patterns.

5.3.1 Long-term versus short-term (LTO) cultural dimension and national innovativeness

The results suggest that cultural dimensions have a significant impact on innovation, and that countries with more feminine, long-term oriented, and restrained cultures tend to have higher levels of innovation compared to those with more masculine, short-term oriented, and indulgent cultures in Africa. This simply means that policymakers and business leaders can develop policies and strategies that promote a culture of innovation and creativity, ultimately driving economic growth and prosperity through fostering values like persistence, market position mentality rather than bottom line, strong ties to tradition among others so as to increase

innovativeness at the national level given that innovation is the soul of a nation's progress. It is pertinent to note though that culture is an elusive lever because much of it is anchored in unspoken behaviours, mindsets, and social patterns.

5.3.2 Masculinity versus femininity (MAS) cultural dimension and national innovativeness

The results suggest that cultural dimensions have a significant impact on innovation, and that countries with more feminine, long-term oriented, and restrained cultures tend to have higher levels of innovation compared to those with more masculine, short-term oriented, and indulgent cultures in Africa. This simply means that policymakers and business leaders can develop policies and strategies that promote a culture of innovation and creativity, ultimately driving economic growth and prosperity through fostering values such as equity rather than equality, small firm size, and high tolerance for errors so as to unlock creativity and innovativeness at the national level given that innovation is the soul of a nation's progress. It is pertinent to note though that culture is an elusive lever because much of it is anchored in unspoken behaviours, mindsets, and social patterns.

5.3.3 Indulgence versus restraint (IND) cultural dimension and national innovativeness

The results suggest that cultural dimensions have a significant impact on innovation, and that countries with more feminine, long-term oriented, and restrained cultures tend to have higher levels of innovation compared to those with more masculine, short-term oriented, and indulgent cultures in Africa. This simply means that policymakers and business leaders can develop policies and strategies that promote a culture of innovation and creativity, ultimately driving economic growth and prosperity through fostering values such as moderate freedoms, high prioritisation, low gratification so as to unlock creativity and innovativeness at the national level given that innovation is the soul of a nation's progress. It is pertinent to note though that culture is an elusive lever because much of it is anchored in unspoken behaviours, mindsets, and social patterns.

5.4 Contribution of the Study

This study set out to achieve three major objectives which were to establish the individual effects of cultural dimensions on national innovativeness. The results suggest that cultural dimensions have a significant impact on innovation, and that countries with more feminine, short-term oriented, and restrained cultures tend to have higher levels of innovation compared

to those with more masculine, long-term oriented, and indulgent cultures in Africa. These findings have important implications for policymakers and business leaders who seek to foster innovation in their respective countries. By understanding the cultural dimensions that influence innovation, they can develop policies and strategies that promote a culture of innovation and creativity, ultimately driving economic growth and prosperity. It is pertinent to note though that culture is an elusive lever because much of it is anchored in unspoken behaviours, mindsets, and social patterns.

5.4.1 Theoretical Contribution

This research study has enhanced strategic management research by showing the applicability of the theory of Competitive Advantage of Nations and Game theory to underpin the variables of national culture and national innovativeness. It is pertinent to note though that culture is an elusive lever because much of it is anchored in unspoken behaviours, mindsets, and social patterns.

5.4.2 Practical Contribution

This research study has important implications for and business leaders who seek to foster innovation in their respective countries and companies. By understanding the cultural dimensions that influence innovation, they can develop policies and strategies that promote a culture of innovation and creativity, ultimately driving economic growth and prosperity.

5.4.3 Policy Contribution

These findings have important implications for policymakers who seek to foster innovation in their respective countries. By understanding the cultural dimensions that influence innovation, they can develop policies and strategies that promote a culture of innovation and creativity, ultimately driving economic growth and prosperity.

The results suggest that cultural dimensions have a significant impact on innovation, and that countries with more feminine, short-term oriented, and restrained cultures tend to have higher levels of innovation compared to those with more masculine, long-term oriented, and indulgent cultures in Africa. It is pertinent to note though that culture is an elusive lever because much of it is anchored in unspoken behaviours, mindsets, and social patterns.

5.5 Recommendations

This study set out to achieve three major objectives which were to establish the individual effects of cultural dimensions on national innovativeness. The results suggest that cultural dimensions have a significant impact on innovation, and that countries with more feminine,

short-term oriented, and restrained cultures tend to have higher levels of innovation compared to those with more masculine, long-term oriented, and indulgent cultures in Africa. Below are some of the recommendations arising from the research study.

5.5.1 Long-term versus short-term (LTO) cultural dimension and national innovativeness

Policymakers and business leaders ought to promote the values of long-term orientation such as persistence, market position mentality rather than bottom line, strong ties to tradition among others so as to increase innovativeness at the national level given that innovation is the soul of a nation's progress. It is pertinent to note though that culture is an elusive lever because much of it is anchored in unspoken behaviours, mindsets, and social patterns. The coefficient of long-term versus short term was positive in the regression analysis for the Global Innovation Index, suggesting that countries that prioritize long-term planning tend to have higher innovation indices. Policymakers should focus on creating policies and programs that encourage more experimentation, risk tolerance, spending on research and development and creativity as a way of achieving quick success and satisfying the ever-changing customer needs, tastes and preferences.

5.5.2 Masculinity versus femininity (MAS) cultural dimension and national innovativeness

Policymakers and business leaders ought to promote the values of femininity orientation like equity rather than equality, small firm size, and high tolerance for errors so as to unlock creativity and innovativeness at the national level given that innovation is the soul of a nation's progress. It is pertinent to note though that culture is an elusive lever because much of it is anchored in unspoken behaviours, mindsets, and social patterns. The coefficient of masculinity vs femininity in the regression analysis for the Global Innovation Index was negative, indicating that more feminine cultures tend to have higher innovation indices. Therefore, organizations and policymakers should work towards promoting a more feminine culture that values collaboration, inclusiveness, tolerance of errors, equitable reward system, small firm size and empathy. This can be achieved by promoting gender equality, encouraging flexible work arrangements, fostering collegiality, and a culture of diversity and inclusion.

5.5.3 Indulgence versus restraint (IND) cultural dimension and national innovativeness

Policymakers and business leaders ought to promote the values of through fostering values such as moderate freedoms, high prioritisation, low gratification so as to unlock creativity and innovativeness at the national level given that innovation is the soul of a nation's progress. It is pertinent to note though that culture is an elusive lever because much of it is anchored in unspoken behaviours, mindsets, and social patterns. The coefficient of Indulgence vs Restraint was negative but significant at a 5% level, indicating that countries that have a more indulgent culture tend to have lower innovation indices. Policymakers should encourage a culture of restraint that promotes self-discipline, thrift, orderliness, saving, self-control and hard work. This can be achieved through policies that incentivize saving, discourage excessive consumption, and promote a strong work ethic. It is crucial to note that these lower-income countries also show lower financial inclusion, so innovators and investors there face more severe capital constraints Allard et. al. (2020).

At the same time, it is important to strike a balance between indulgence and restraint, as too much restraint can stifle innovation and creativity by suppressing consumerism.

5.6 Limitations of the Study

This study only examines the relationship between cultural dimensions and the Global Innovation Index and does not explore potential mediators or moderators of this relationship. For example, it is possible that factors such as access to education, funding, or infrastructure could moderate the impact of cultural dimensions on innovation.

The study only examined the impact of cultural dimensions on innovation at a national level. It may be more informative to examine the impact of these cultural dimensions on innovation at the organizational or individual level, as innovation is often driven by individual and organizational factors. It is pertinent to note that the overall r-square was 0.1188 (11.88%) meaning that our regression model only explains 11.88% of the relationship hence 89.12% is explained by other factors.

The study used secondary data from existing sources, which may have limitations in terms of reliability and validity. The data may have been collected for a different purpose and may not be fully representative of the cultural dimensions or innovation in the countries studied.

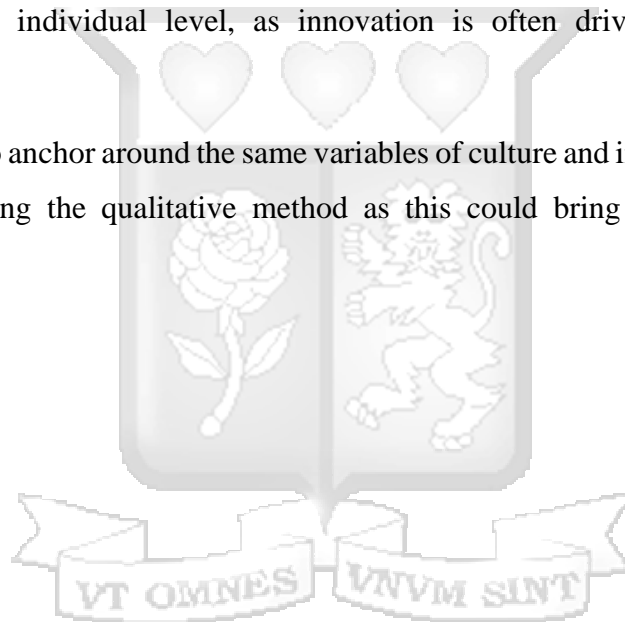
5.7 Areas Recommended For Further Research

Future studies can use primary data collection by use of perceptions of the respondents to enhance the understanding of national culture and national innovativeness in select African countries. This would bring out a more qualitative and nuanced understanding of the influence of national culture on national innovativeness in select African countries.

Further research could explore these potential moderators to gain a more nuanced understanding of the relationship between culture and innovation for instance it is possible that factors such as access to education, funding, or infrastructure could moderate the impact of cultural dimensions on innovation.

Further research could also explore the impact of these cultural dimensions on innovation at the organizational or individual level, as innovation is often driven by individual and organizational factors.

Future studies can also anchor around the same variables of culture and innovativeness between specific countries using the qualitative method as this could bring about interesting and impactful results.



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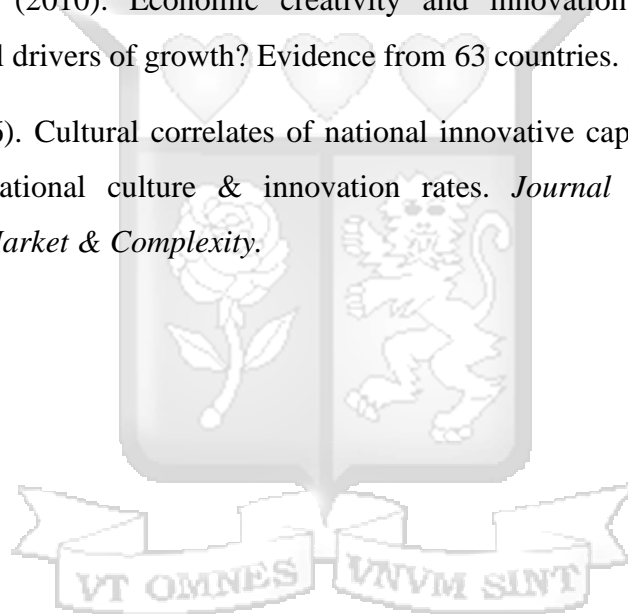
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APPENDICES

Appendix I: Cover Letter

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Email: info@sbs.ac.ke or visit www.sbs.strathmore.edu



31st May 2023

To Whom It May Concern,

RE: FACILITATION OF RESEARCH – PAUL HERMAN.

This is to introduce Kimbowa Paul Herman who is a Master of Commerce (MCOM) Student at Strathmore University Business School, admission number MCOM/147391. As part of our MCOM Programme, Herman is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MCOM course. To this effect, Herman would like to request appropriate data from your organization.

Herman is undertaking a research paper on “**The Influence of National Culture on National Innovativeness in Select African Countries.**” The information obtained shall be treated confidentially and shall be used for academic purposes only.

Our MCOM Programme seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

A handwritten signature in black ink, appearing to be "Njoki Kiagiri".

Njoki Kiagiri
Manager – Graduate Programmes
Strathmore University Business School.

Appendix II: List of Countries

Country identification number	
I.D	Country
1	Burkina Faso
2	Ghana
3	Mali
4	Nigeria
5	Tanzania
6	Uganda
7	Rwanda
8	Ethiopia



Appendix III: Data collection Instrument

Id	Year	GII	PDI	IDV	MAS	UAI	LTOWVS	IVR
1	2011	23	77	20	46	54	27	18
1	2012	25	77	20	46	54	27	18
1	2013	27	77	20	46	54	27	18
1	2014	28	77	20	46	54	27	18
1	2015	29	77	20	46	54	27	18
1	2016	21	77	20	46	54	27	18
1	2017	22	77	20	46	54	27	18
1	2018	19	77	20	46	54	27	18
1	2019	23	77	20	46	54	27	18
1	2020	20	77	20	46	54	27	18
1	2021	21	77	20	46	54	27	18
1	2022	15	77	20	46	54	27	18
2	2011	32	77	20	46	54	4	72
2	2012	30	77	20	46	54	4	72
2	2013	31	77	20	46	54	4	72
2	2014	30	77	20	46	54	4	72
2	2015	28	77	20	46	54	4	72
2	2016	27	77	20	46	54	4	72
2	2017		77	20	46	54	4	72
2	2018	25	77	20	46	54	4	72
2	2019	25	77	20	46	54	4	72
2	2020	22	77	20	46	54	4	72
2	2021	22	77	20	46	54	4	72
2	2022	21	77	20	46	54	4	72
3	2011	26	77	20	46	54	20	43
3	2012	25	77	20	46	54	20	43
3	2013	29	77	20	46	54	20	43
3	2014	26	77	20	46	54	20	43
3	2015	28	77	20	46	54	20	43
3	2016	25	77	20	46	54	20	43

3	2017	23	77	20	46	54	20	43
3	2018	23	77	20	46	54	20	43
3	2019	24	77	20	46	54	20	43
3	2020	19	77	20	46	54	20	43
3	2021	20	77	20	46	54	20	43
3	2022	14	77	20	46	54	20	43
4	2011	28	77	20	46	54	13	84
4	2012	25	77	20	46	54	13	84
4	2013	27	77	20	46	54	13	84
4	2014	28	77	20	46	54	13	84
4	2015	24	77	20	46	54	13	84
4	2016	23	77	20	46	54	13	84
4	2017	22	77	20	46	54	13	84
4	2018	22	77	20	46	54	13	84
4	2019	24	77	20	46	54	13	84
4	2020	20	77	20	46	54	13	84
4	2021	20	77	20	46	54	13	84
4	2022	17	77	20	46	54	13	84
5	2011	27	64	27	41	52	34	38
5	2012	24	64	27	41	52	34	38
5	2013	26	64	27	41	52	34	38
5	2014	26	64	27	41	52	34	38
5	2015	27	64	27	41	52	34	38
5	2016	26	64	27	41	52	34	38
5	2017	28	64	27	41	52	34	38
5	2018	28	64	27	41	52	34	38
5	2019	27	64	27	41	52	34	38
5	2020	26	64	27	41	52	34	38
5	2021	26	64	27	41	52	34	38
5	2022	19	64	27	41	52	34	38
6	2011	26	64	27	41	52	24	52
6	2012	26	64	27	41	52	24	52

6	2013	31	64	27	41	52	24	52
6	2014	31	64	27	41	52	24	52
6	2015	28	64	27	41	52	24	52
6	2016	27	64	27	41	52	24	52
6	2017	27	64	27	41	52	24	52
6	2018	25	64	27	41	52	24	52
6	2019	26	64	27	41	52	24	52
6	2020	21	64	27	41	52	24	52
6	2021	20	64	27	41	52	24	52
6	2022	16	64	27	41	52	24	52
7	2011	26	64	27	41	52	18	37
7	2012	28	64	27	41	52	18	37
7	2013	28	64	27	41	52	18	37
7	2014	29	64	27	41	52	18	37
7	2015	30	64	27	41	52	18	37
7	2016	30	64	27	41	52	18	37
7	2017	27	64	27	41	52	18	37
7	2018	27	64	27	41	52	18	37
7	2019	27	64	27	41	52	18	37
7	2020	25	64	27	41	52	18	37
7	2021	24	64	27	41	52	18	37
7	2022	19	64	27	41	52	18	37
8	2011	23	64	27	41	52	32	46
8	2012	23	64	27	41	52	32	46
8	2013	25	64	27	41	52	32	46
8	2014	25	64	27	41	52	32	46
8	2015	24	64	27	41	52	32	46
8	2016	25	64	27	41	52	32	46
8	2017	24	64	27	41	52	32	46
8	2018		64	27	41	52	32	46
8	2019	24	64	27	41	52	32	46
8	2020	18	64	27	41	52	32	46

8	2021	19	64	27	41	52	32	46
8	2022	16	64	27	41	52	32	46



Appendix IV: Ethical Approval



24th May 2023

Mr Kimbowa Paul Herman,
paul.kimbowa@strathmore.edu

Dear Mr Kimbowa,

RE: The Influence of National Culture on National Innovativeness in Select African Countries

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU-masters** research proposal. Your application reference number is **SU-ISERC1698/23**. The approval period is from **24th May 2023 to 23rd May 2024**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used.
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 72 hours of notification.
- iv. Any changes anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 72 hours.
- v. Clearance for the export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.


Before commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke/> and obtain other clearances needed.

Yours sincerely,

for: **Mr Ambrose Rachier,**
Chairperson; SU-ISERC




Appendix V: NACOSTI Permit


NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION


Date of Issue: **02/July/2023**


RESEARCH LICENSE



This is to Certify that Mr. Paul Herman Kimbowa of Strathmore University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: The Influence of National Culture on National Innovativeness in Select African Countries, for the period ending : 02/July/2024.

License No: **NACOSTI/P/23/27350**


Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

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Applicant Identification Number
188413