UNIVERSITY OF Southampton

# (Innovation propensity and Entrepreneurial characteristics amongst Saudis)

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## Thesis abstract:

The fields of research investigating the economy, innovation and entrepreneurship have often ignored the impacts of religion and culture. More specifically, describing the impacts of religion on individuals and how religion effects the characteristics of entrepreneurs deserve scholarly consideration. Therefore, this study aims to scrutinise the influence of the religion Islam on innovation propensity and number of entrepreneurial characteristics, including risk-taking propensity self-efficacy, and internal locus of control, in the context of one of the dominant Islamic countries, Saudi Arabia. The research follows on from literature that links religion, economy and entrepreneurial characteristics. Using the institutional theory, this research consists of three papers that examine three areas concerning innovation and entrepreneurship in an Islamic society. The first paper examines the relationship between Islamic religiosity and innovation propensity using the three institutional theory dimensions of Islam: normative, cognitive and regulative. The second paper extends this work by examining whether gender might influence this relationship and shows the influence of Islamic religiosity on both men's and women's innovation. The third paper examines two aspects. First, it explores the influence of Islamic religiosity on the three entrepreneurial characteristics (risk-taking, self-efficacy and internal locus control). Secondly, it examines the differences in these entrepreneurial characteristics between Muslim entrepreneurs and non-entrepreneurs. The three papers utilised a quantitative approach to inspect data obtained by questionnaires sent to Saudi Muslim people. The current study has employed Ordinary Least Squares (OLS) regression and Logistic (Logit) regression to test the research hypotheses. The three papers found a positive impact of Islamic religiosity on innovation propensity and a positive impact of Islamic religiosity on both men's and women's innovation. However, it showed that Muslim men are more likely to demonstrate innovation propensity than Muslim women. In addition, the third paper on this study showed a positive effect of Islamic religiosity on the three entrepreneurial characteristics under investigation. The overall research offers a number of contributions, as well as considering practical implications by providing a comprehensive understanding of the relationship between Islam and the entrepreneurial characteristics, within a context that has previously lacked full scholarly attention and it reveals new insights at the junction of the religion Islam, innovation and entrepreneurship.

This thesis made a number of contributions to the understanding of the relationship between, innovation, entrepreneurship and religiosity. It provided a multi-layered explanation for understanding this relationship and showed new results that were not mentioned before as the presence of the impact of Islam on attitudes towards innovation and entrepreneurship through religious texts and explained how Islam shapes the differences between men and women in its creation. It showed the impact of Islam on some entrepreneurial characteristics such as taking risks, self-efficacy, and internal control, and how Islam shapes the differences between entrepreneurs and non-entrepreneurs in these entrepreneurial characteristics.

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## Declaration of authorship:

I, Amal S. Alfawzan, declare that this thesis, entitled: “Innovation and entrepreneurial characteristics in Saudi Arabia” and the work presented in it is my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University.
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated.
3. Where I have consulted the published work of others, this is always clearly attributed.
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work.
5. I have acknowledged all main sources of help.
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself.

Signed: Amal S. Alfawzan

Date: 22th June 2022

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In the Name of God, the Most Beneficent, the Most Merciful

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# Chapter 1:

## Introduction

## 1.1. Introduction:

This chapter introduces the thesis and begins by summarising the background of the research. It defines the research problem and describes the research problem, explaining the significance of the study and why the study is essential. The aims and objectives of the study are set out as well as the research questions. It explains the gap in knowledge that the study aims to fill and describes the research context: The Kingdom of Saudi Arabia. This chapter concludes by delineating the structure and contents of the thesis.

## 1.2. Research background and statement of the problem:

Most countries in the Islamic world are relatively unsuccessful economically and do not have well-developed systems to support their populations (Kuran, 1997, Noland, 2005). The United Nations have issued figures comparing predominately Muslim countries with the rest of the world, suggesting that these countries are either developing, less developed or underdeveloped. The Gross Domestic Product (GDP) for Arab nations and the growth rate are very low compared with developing and developed countries (Elbagory, 2018). Even in countries that are rich in natural resources, they tend to be low investment in people, fewer work opportunities, an inadequate quality of education and low productivity (Bhalla, 2002; Kuran, 2012). The major prospect of dependence on non-renewable natural resources will be a problem that may result in more difficulties for these countries.

Previous literature was trying to explore this lack of prosperity. Experts in politics and economics from the Western world tend to use theories of modernisation that propose the existence of a negative link between religion and development in predominantly Muslim countries. These arguments are used to explain both slow economic progress and the actions of governments and criticise the religion itself (Hassan and Hippler, 2014). The religion Islam is seen as resisting developmental progress and religious adherence is suggested as being the principal cause of low economic progress in Muslim states. Kuran (2008) argued that Muslims are essentially inefficient and that their system of values is intrinsically resistant to modernisation, at a time when adapting quickly to modern trends is seen as vital. Kuran views Islam as being fundamentally incapable of being contemporary. A number of scholars have listed the disadvantages of Islam which they argue has caused an

inability to modernise societies or create advanced economic systems for the benefit of a wider part of their populations. One frequent assertion that critics make is that Islamic law (Sharia) obstructs development and restricts people's level of freedom, limits their rights to hold on to property (Zelekha *et al*., 2014), insists on profoundly restricting women's involvement in the workforce (Perkins, 2003) and permits inadequate organizations (Kuran, 2008). Furthermore, critics argue that Islam impedes important attributes of entrepreneurs such as innovation and risk-taking propensity (Bartke and Schwarze, 2008); in addition, Islam tends to impart external obedience to its followers (Arslan, 2001).

Saudi Arabia is the most well-known Islamic country where the Islamic religion is centred. Therefore, compared to many Islamic nations, Islam being the national religion, it has a central function for the government and the entire law-making system as well as influencing individuals' behaviour and their local societies (Williams and Zinkin, 2005; Zinkin, 2007). Authority in Saudi Arabia bases the country's official laws on Islamic principles derived from the earliest times of Islamic inception and expansion. Saudi Arabia's constitution is based on the Holy Quaran and both the Saudi government's legal and organizational systems are founded on the principles of Islam. This is based on four important Islamic foundations; the Holy Quran, the Hadith the Qiyas and Ijma (Bowen, 2014). It should be noted that the Hadith consists of the sayings and actions of Mohammed (peace be upon him [pbuh]), whereas Qiyas are the procedure of analogical thinking by spiritual experts to decide on solutions to new issues while Ijma is the agreement of knowledgeable scholars on several topics. Therefore, Islam is the foundation of the religious and ethical codes of Saudi people nevertheless importantly likewise of the standards and customs of its main institutions.

A significant factor is that Saudi Arabia has experienced a high economic level of growth during the last twenty years. The Kingdom earns considerable profits from the yield of around 12 million oil barrels daily, Saudi Arabia being the world's main oil producer (Bradshaw and Connolly, 2019). However, despite this vast oil production, the country has not yet achieved the desired level of development. Furthermore, regardless of Saudi Arabia's international economic position, through being a leading oil exporter, it has a high unemployment rate (Alrasheedy, 2019). In 2020 the unemployment rate of Saudi women was 24.4%, while the rate for Saudi men was 7.1% (GAS, 2020).

Economic diversification and investment in a better functioning economy for business investment, among other areas, is now vital for the future of the Kingdom (Dev, 2016). In an attempt to resolve this problem, Saudi Arabia's policymakers have created projects investing in large infrastructure schemes such as the building of health facilities, educational establishments and modern technology. Nevertheless, the development and modernisation undertaken by the Saudi government needs to create more employment opportunities for younger Saudi nationals, both male and female.

Therefore, this study focuses on categorizing some schemes that might contribute to decreasing the number of jobless Saudi citizens such as innovation and entrepreneurship. These include How does Islam, a legislator of laws in Saudi Arabia, affect both innovation and entrepreneurship? Du Plessis (2007) affirms that one important aspect of the economy is innovation, which has recently received academic attention due to the fact that innovation has an important role in promoting economic development (Du Plessis, 2007). Likewise, ACS (2006) supports the idea that entrepreneurship is a major successful factor which has demonstrated its contribution in encouraging economic development in emerging countries by establishing new enterprises. Audretsch and Thurik (2001) argue that entrepreneurial activity significantly lower subsequent unemployment levels. Sitoula (2015) confirmed that innovation and entrepreneurship contribute considerably to economic development by augmented work openings. Innovation and entrepreneurship are normally encouraged to combat deprivation, empower communities and increase job prospects (Nasiru *et al*.,2015). Research has demonstrated that innovation and entrepreneurship can empower a country to combat issues including low progress rates and joblessness through creating new employment (Koe *et al*., 2014; Lee and Huang, 2018; Zvarikova and Kacerauskas, 2017).

Consequently, it is essential to research and reveal some of the factors that influence innovation propensity and entrepreneurial traits. Previous studies have discovered that religion and demographic factors including age, gender, educational background and previous work experience impact innovation propensity and entrepreneurial traits (Dana, 2010, Benabou *et al*., 2015). Most of the existing academic literature has studied the

connections between innovation, entrepreneurial characteristics, and religion in the context of Western societies. However, less research has investigated the influence of Islam on these two economic phenomena. This thesis will help to recognize a number of the elements that might help promote innovation propensity and some entrepreneurial characteristics in order to reduce unemployment and improve the economy of Saudi Arabia. Therefore, this research examines the effects of religion and investigates how an understanding of innovation propensity, risk-taking tendency, self-efficacy and internal locus of control among Saudi Muslims will improve the economy of their society.

## 1.3. Thesis aims, sub-aims and research questions:

This study has one main goal and ten sub goals established during the research. The primary goal is to observe the impact of Islamic religiosity on both the innovation propensity and three intrapreneurial characteristics, risk-taking, self-efficacy and internal locus of control in Saudi Arabia. Ten sub-aims have been developed within this broad aim and are investigated in the three papers that this thesis consists of. Each sub-aim has been addressed by one research question. The next table demonstrates these sub-goals and their matching study questions, paper title and chapter number:

Table (1.1): Thesis sub-aims and research questions

| Thesis sub-aims | Paper questions | Paper Title | Chapter |
|---|---|---|---|
| 1 -To investigate the ways in which the norms of Islam influence Muslim propensity towards innovation.<br>2- To investigate how aspects of the cognitive dimension of Islam influence Muslim propensity towards innovation.<br>3- To explore how the regulative dimension of Islam affects Muslim propensity towards innovation. | 1- How does the normative dimension of Islam impact Muslims' innovation propensity?<br>2- How does the cognitive dimension of Islam affect Muslims' innovation propensity?<br>3- How does the regulative dimension of Islam impact Muslims' innovation propensity? | The impact of Islamic religiosity on Innovation propensity | 2 |
| 1 -To examine the effect of Islam on the innovation propensity of Muslim women<br>2- To examine the effect of Islam on the innovation propensity of Muslim men innovation.<br>3- To investigate the difference between Muslim women and men on the relationship between Islam and innovation propensity. | 1- What effect does Islam have on the innovation propensity of Muslim women?<br>2- What effect does Islam have on the innovation propensity of Muslim men?<br>3- What is the difference between women and men in the relationship between Islam and innovation propensity? | Gender and the relationship between Islamic religiosity and Innovation propensity | 3 |

| | | | |
|---|---|---|---|
| 1 -To examine the relationship between Islam and risk-taking in Saudi Arabia.<br>2-To explore how Islam can impact self-efficacy in Saudi Arabia.<br>3- To investigate how Islam can affect the internal locus of control in Saudi Arabia.<br>4- To investigate the variation between entrepreneurs and non-entrepreneurs in the three mentioned entrepreneurial characteristics in Saudi Arabia. | 1-What is the relationship between Islam and risk-taking?<br>2- How can Islam impact self-efficacy in Saudi Arabia?<br>3- How can Islam effect the internal locus of control in Saudi Arabia?<br>4- What is the difference between entrepreneurs and non-entrepreneurs in the three mentioned entrepreneurial characteristics in Saudi Arabia. | The impact of Islam on three Entrepreneurial Characteristics, risk-taking, self-efficacy and effect internal locus of control, in Saudi Arabia. | 4 |

## 1.4. The link between the three papers:

Few studies have shown that religion has an essential role in encouraging economic progress (Gundolf and Filsner, 2013). The principal goal of this research is to scrutinise the effect of Islam on a number of significant factors that drive economic expansion and decreases unemployment (Du Plessis, 2007; ACS 2006), namely innovation and three entrepreneurial characteristics, risk-taking, self-efficacy and internal locus of control. The first paper observes the influence of Islam on innovation propensity as innovation is an essential factor driving economic development and reducing unemployment. This paper aims to explore the relationship at an individual level to obtain a complete interpretation of innovation in a Muslim context: Saudi Arabia. The second paper was developed from the results of the first paper. These results showed substantial variation between females and males in innovation propensity. Thus, since gender is an important variable, it was necessary to research in-depth whether gender has an effect on this relationship. In addition, an investigation was necessary to examine how Islam shapes these differences, attempting to draw a bigger picture of the rule of Islam on innovation propensity among Muslims. Finally, the third paper was designed to investigate the effect of Islam on the three entrepreneurial characteristics risk-taking, self-efficacy and internal locus of control and the variation between entrepreneurs and non-entrepreneurs on this association. The figure below shows the three papers of this thesis.

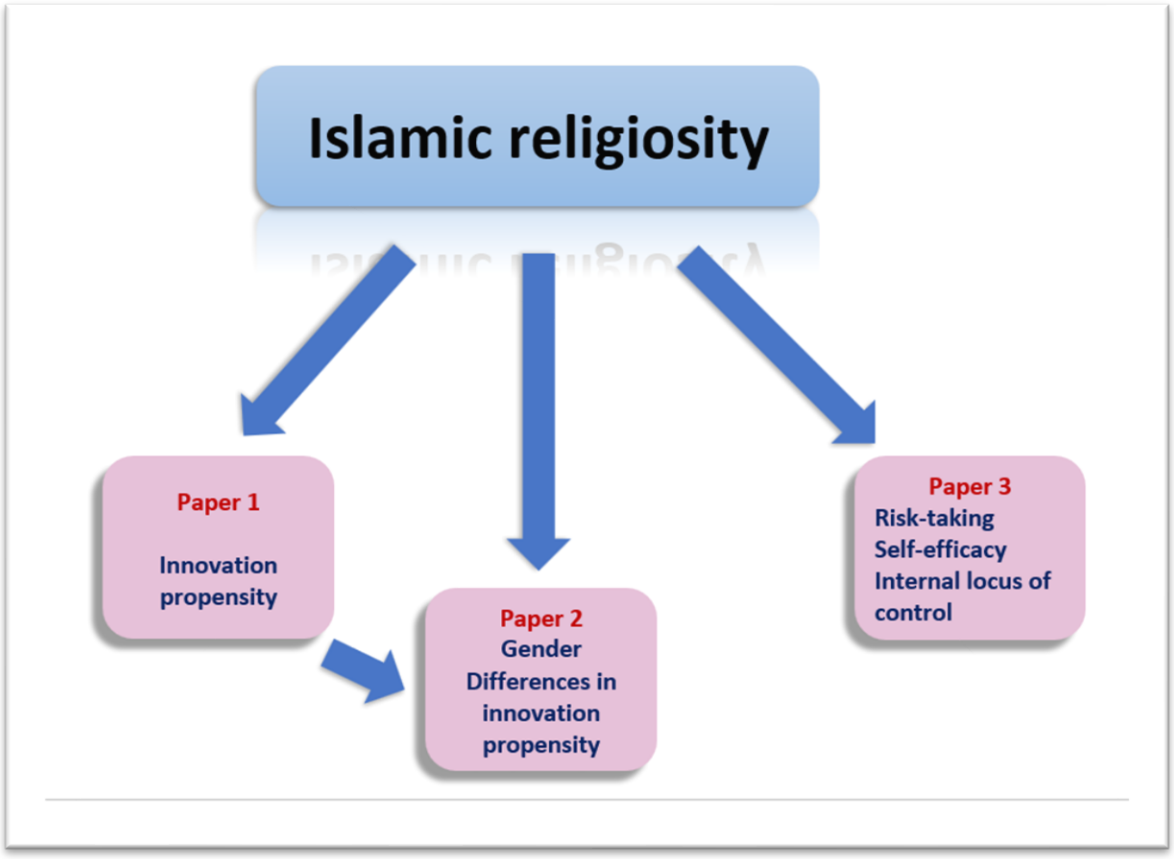


Figure 1.1: the three papers of this thesis.

## 1.5. Research gap and significance:

The aim of this study is to fill the gap existing in the literature that examines the impact of Islam on both innovation propensity and the characteristics of entrepreneurship. Inside this area of study, it is appropriate to add to the scholarly knowledge about the connection between Islam, innovation and three more entrepreneurial characteristics by investigating the prevailing research about these subjects. An appraisal of this research shows that current economic studies concerning the association between religion, innovation and the three characteristics of entrepreneurship is mainly focused on the influences of faiths such as Christianity on economic and entrepreneurial phenomena. However, a lack of investigation seems to have been carried out about the religion of Islam overall, particularly in Muslim dominated countries, for example the Kingdom of Saudi Arabia (Alturki and Braswell, 2010; Gallant *et al.,* 2010).

Previous studies concerning the links between Islam and economic growth have two approximately opposite opinions. Some academics declare that observance of the principles

of Islam should be seen as the chief cause of economic inertia in Islamic countries. The scholars allege that the attributes of Islamic law allow for reduced freedom, inadequate institutions, inadequate rights of ownership and low levels of contributions of women in the workforce. Such challenges add more rules discouraging entrepreneurial activities including innovation, risk-taking, self-efficacy and/or developing an internal locus of control. However other academics suggest that Islamic traditions cover some economic dimensions such as work ethics, justice and freedom as well as problem solving which in turn promotes entrepreneurship.

Nevertheless, this literature exposes an incomplete image of how Islamic religiosity can influence these entrepreneurial characteristics. So far, there has been scarce empirical research to decide whether Islam's claim is a constraint on economic activity and development is valid. Therefore, reviewing the association between Islam and economic development is a valuable field to explore. Consequently, the primary purpose of this research is to fulfill the research gap by exploring the relationship between Islamic religiosity as regards adherence to Sharia and number of elements involved in improving entrepreneurship and economic development in Saudi Arabia.

The research problem presented is an important problem in Saudi society and affects the level of unemployment and the country's economy. Therefore, trying to find causes and solutions through empirical academic research may help to raise the country's economy and change its culture. The high unemployment rate and the decrease in the number of entrepreneurs and innovators in Saudi Arabia is extremely important. Especially since the unemployment rate for women in Saudi Arabia is very high.

When the researcher wanted to start her research, she realized that there are many factors that may be an important in the low percentage of entrepreneurs and innovators and the high unemployment rate. The researcher was keen on deep research, reflection and reading in previous studies that talk about the causes of this problem and the factors that affect it such as the country's culture, systems and policies, religion, gender and age. Religion was a richer field of research for several reasons; first, the lack of studies that researched innovation and entrepreneurship in an Islamic context, and secondly, Islam is considered a foundation and an important factor in Saudi Arabia, as all regulations and laws

in the country are based on it. Most of the inhabitants of the Kingdom of Saudi Arabia are Muslims, and they are affected by what Islam commands them to do and leave what it forbids. Third, some studies mentioned that the Islamic religion is an obstacle to some of the entrepreneurial qualities. These reasons encouraged the researcher to search for the effect of Islam on some of the entrepreneurial qualities. The researcher chose the Kingdom of Saudi Arabia to be the place of research, because Saudi Arabia is considered one of the most important Islamic countries. In addition, the researcher is from the Kingdom of Saudi Arabia, which makes it easier for her to reach the largest number of participants in the research. The researcher began to search for this topic using critical writing and based on academic evidence in order to reach logical conclusions. The researcher is keen that the sources of information are from classified scientific journals. The evidence and information that was used in this research is a combination of academic scientific research, Quranic verses and prophetic hadiths.

Number of Quranic evidence and prophetic hadiths have been used because they are the main sources in Islam. In the studies that investigate the effect of Islam on any social phenomenon, the Qur'anic evidence must be used for more logical reasoning. The researcher not only referred to the Quranic verses as evidence, she followed every Quranic verse with an academic source. The researcher tried to build the opposing arguments and viewpoints on a logical and scientific basis based on evidence. She reviewed many previous studies that assert that Islam opposes innovation and entrepreneurship. The evidence, academic evidence and logical conclusions that prove that Islam encourages its followers to turn to innovation and entrepreneurship was strong and convincing, which led the researcher to build the hypothesis of the thesis. With regard to the selection of research questions, the researcher tried to reach academic questions that combine some characteristics and criteria. For example, questions of Islamic religiosity must measure the behaviour and beliefs of a Muslim because the Islamic religion is a combination of behaviour and beliefs. The researcher was also keen to use Muslim scholars and not those translated to English to be more accurate. Benabo (2015) mentioned that, with regard to the questions of innovation propensity, it was important to measure attitude towards new ideas, and some attitudes that are considered effective towards innovation, such as taking risks and changing.

This study contributed to giving a multi-layered explanation of the impact of Islamic religiosity on innovation propensity and entrepreneurship by using institutional theory. This study contributed to the rare research that studied this relationship in developing countries by studying this relationship in the context of the Kingdom of Saudi Arabia. This study contributed to adding a measure of Islamic religiosity, a measure taken from a Muslim scholar and not translated from English. It also contains questions that measure the behaviour and belief of Muslims. This thesis added new knowledge to the previous literature that examined the relationship between religion and innovation. As it found that religion affects innovation and entrepreneurship through religious texts, which was not mentioned in previous studies. The results of this study clarified how the Islamic religion constitutes the differences between men and women, which is considered a scientific contribution, as previous studies referred only to these differences and their causes. This thesis contributed to clarifying how Islam affects some of the characteristics of entrepreneurship, such as taking risks, self-efficacy, and internal control. It is also explained how Islam shaped the differences between entrepreneurs and non-entrepreneurs in these entrepreneurial characteristics

## 1.6. Research Context: The Kingdom of Saudi Arabia:

First of all, to undertake an investigation, it is imperative to comprehend the background where the issue exists and its' elements interact. This section provides readers with the basic facts required to understand the social and economic background of the study. The research context describes the nation in which the current study was carried out, which is Saudi Arabia, one of the most important Muslim countries. This section provides an outline of the organisation of authority, a summary of Islam and facts about the position of the nation and its people. Next, the Saudi economy is described and the environment in which entrepreneurship functions is evaluated.

Al-Saggaf (2004) noted that the religion Islam significantly impacts both society and culture in Saudi Arabia. Islam is the foremost religion in Saudi Arabia; its adherents are now one of the most numerous religious groups in the world (Grimm *et al*., 2015). In addition, the acceptable rules of all economic processes in Saudi Arabia, both official and unofficial, are defined obviously by Islamic principles. The texts of the Holy Quran describe all features

of human existence, such as the relationship between God and His creations and links between individuals and society, including laws, morals, jurisprudence, politics and communal relations. The second primary basis of the Saudi organization of law is the Sunna. It complements the Holy Quran and assists clarify and understand the Quran, however, it should not be used inconsistently on the Quran. The Sunna includes all the instructions conveyed by Mohammed: his sayings and descriptions of his actions during his lifetime.

The SA's entire population is approximately around 35 million people, including around 26 million ethnic Saudis, as well as a projected nine million workers from other countries who reside in the Kingdom of Saudi Arabia (GAS, 2020). Fewer than a quarter (24 percent) of the population reside in the capital city, Riyadh which is the main city in Saudi Arabia. There seems to be an equitable mix between men and women: 50.9 percent and 49.1 percent, correspondingly (UNP, 2020).

In 1932, the KSA national economy depended mainly on income derived from numerous Islamic pilgrims who travel annually to stay in Mecca and Medina. In addition, revenue was derived from farming (Champion, 2003), however, it was mainly from the coast near the Arabian Gulf. The discovery of oil in 1936 in the eastern area of Saudi Arabia altered the situation and when crude oil began production in 1938 the economy of the country started to grow. More than 90 percent of export incomes in the country are derived from oil (Ramady, 2010). One additional statistic is that GDP grew by 97 percent from 2009 to 2012, rising from $369 billion to $727 billion yearly (GAS, 2012). Concurrently with the huge upsurge, however, unemployment still increased (Aluwaisheg, 2013). This illustrates how tiny an impact the fast development of the economy has on unemployment numbers aside from the government's exertions at encouraging Saudisation or the preferential employment of Saudi workers instead of people from other countries (GAS, 2020).

When discussing economic participation in Saudi Arabia, entrepreneurship must be discussed. While developing entrepreneurship in the country, many suggestions were given to assist the modification of the economy. Small and medium businesses account for merely around 20% of Saudi Arabia's Gross Domestic Product when the figure is as much as 70 percent in other country's economies. Although work to advance the enterprise environment has started, small businesses in the country are limited due to the

complication of the administrative and regulatory processes, sluggish increases in capability and being less successful in attracting talent and through problems in obtaining funding. There are several initiatives in Saudi Arabia to support enterprises in obtaining increased revenue and encourage commercial organizations to improve obtainable assistance to 20 percent by 2030. A significant enterprise was the establishment of 25 institutions of business and manufacturing to promote both innovation and entrepreneurship, with respective institutes being accountable for supplying investment opportunities and financial recommendations whenever necessary. Inside the region the Riyadh Chamber of Commerce and the Al-Sayedah Khadijah bint Khuwailid Businesswomen Centre can now be esteemed as being the two greatest successful organizations that promote entrepreneurship, which then encourages additional business innovation. These initiatives advance economic progress and guarantee that Saudi Arabia becomes competitive worldwide and develops the employment potential of its population, which will create a variation of revenue and emphasising the significance of supporting the state-owned economy. Yet, the growth of entrepreneurship is still restricted in Saudi Arabia (Ceptureanu and Ceptureanu, 2015; Mehtap *et al.,* 2017). Fallatah (2020) argues that the legal regulations and operations for founding an enterprise in the country are ineffective and the usefulness of existing rules does not properly defend the rights of entrepreneurs. Furthermore, oil rents allowed entrepreneurial activities in Saudi Arabia to be limited, thus preventing the country from evolving a productive and sustainable business sector generating national income (Ansari, 2017). Kayed and Hassan (2011) argued that oil wealth prevented the development of entrepreneurial qualities among many potential Saudi entrepreneurs, which prevented the emergence of new enterprises. Moreover, Hassan, and Hippler, (2014) argue that Islamic entrepreneurs are obliged by the rules of their religion to refrain from taking part in particular monetary and economic activities, including moneylending and gambling. Entrepreneurs in Western countries might elect to relinquish specific business opportunities for religious reasons but any restrictions are of their own choice and are usually less limiting compared to the ones in Islamic countries.

## 1.7. Characteristics of the Saudi context for entrepreneurship and innovation.

The government of Saudi Arabia has made considerable efforts to stimulate innovation and entrepreneurship by creating various institutions which promote entrepreneurial characteristics. The King Abdulaziz Foundation for Innovation and Talent is an example of this effort. The main aim of this institution is to contribute to increasing the level of awareness of the importance of innovation and entrepreneurship and to make available technical and legal advice to innovators (Usman, *et al.,* 2021). In addition, there is the Kafala program, it is a principle derived from the teachings of Islam Kafala and was initiated in 2006 by a decision of the Ministry of Finance, which is an important institution that provides funding for small and medium enterprises and is supported by a Saudi bank. This program aims to access financing methods for innovators and creators to help them develop their innovations and turn them into real projects that practically contribute to improving the country's economy and create more job opportunities (Altokhais, 2017). The Saudi Credit and Savings Bank is one of the most important institutions that support entrepreneurs and innovators. There are many financing paths in this bank and the maximum amount of financing may reach approximately four million Saudi riyals (Abdulaziz, 2010). In addition to that, the Wa'ed Company in Saudi Aramco is one of the active initiatives that embrace innovative and pioneering projects and turn them into reality. Wa'ed is based on the principle of cooperation, which is one of the most important pillars of Islamic work ethics. The company provides valuable advice that helps improve the chances of success for future entrepreneurs. This company has designed a training program to provide entrepreneurs and innovators with the required knowledge and skills that meet the conditions of the Saudi labour market (Shokeir and Alsukaity, 2019). Moreover, these achievements were not the only ones to support innovation and entrepreneurship, in addition there are many institutes such as the National Institute of Entrepreneurship which is a governmental non-profit organization. One of the most important goals of this organization is to work on spreading the culture of self-employment and the correct direction of entrepreneurial behaviour (AL-mani, 2020). Furthermore, there is the Society of Saudi Innovators and Creators, located at Imam bin Saud University which is one of the most important government agencies supporting innovation. This association works to devote its

activities to raising the level of innovation in the country. It works hard to encourage innovators, provide scientific work environments for innovative young people and provide networks of communication with innovators in other countries (King Abdulaziz Foundation, 1999). In addition, there has been support from the community which was carried out by a group of young entrepreneurs and businessmen. For example, the Oqal Group (Minds and Money) which is a partnership between the owners of innovative ideas and businessmen investing money in order to obtain innovative and pioneering projects that benefit Saudi society.

In this context it is important to stress that all these effective contributions are closely related to the Islamic religion. Most of these contributions are based on Islamic foundations and concepts set down by Islam. It is based on the principle of cooperation between members of the Muslim community, which is an important concept in Islamic religiosity (Yousef, 2000). Moreover, these initiatives are based on the notion of reliance on God in any work and in any partnership (Farhan, 2016). It is also based on the principle of fairness, equity and sharing of profits and losses (Millar and Anwar, 2009). These initiatives are concerned with avoiding any work or partnership that is forbidden in Islam. Therefore, the Islamic religion has an effective impact in shaping attitudes and behaviour among members of Saudi society.

## 1.8. Thesis structure:

The thesis is organized in six chapters. The details of each chapter are delineated in Table 1.2 below.

Table (1.2): Chapters delineated

| Chapter No | Chapter Title | Description |
|---|---|---|
| Chapter 1 | Introduction | It offers an overview of the thesis, study goals and study questions, Research gap and significance, The research context: The Kingdom of Saudi Arabia and thesis structure. |
| Chapter 2 | Institutional theory | This chapter is giving a summary of the Institutional theory and the three papers |

| | | |
|---|---|---|
| Chapter 3 | The impact of Islamic religiosity on Innovation propensity (paper 1). | These chapters embody the main section of the thesis even though they are formed as one complete project. |
| Chapter 4 | Gender and the relationship between Islamic religiosity and Innovation propensity (paper 2). | These are separate papers. Every chapter comprises a study paper that contains a separate introduction. |
| Chapter 5 | The impact of Islam on Entrepreneurial Characteristics (paper 3). | Literature review, methodology, results, discussion and conclusions. |
| Chapter 6 | Conclusions | This section offers conclusions for the complete thesis. It recapitulates the approach of the study and its results. It returns to the study goals and clarifies the results, contributions, consequences and limitations. |

## 1.9. Chapter conclusion:

This chapter presented a summary of the study goals and questions. The chapter introduced a concise description of the context of the study, giving a definition of the issues to be studied and illustrating the importance and contribution of the research. Predominant goals of the thesis and the study questions were examined. In addition, the chapter furnished an impression of the research gap and significance. In following sets out the research context, The Kingdom of Saudi Arabia. The chapter is completed through delineating the content and structure of this work.

# Chapter 2:

## Institutional Theory

## 2.1. Multi-layered perspective utilising the institutional theory:

Institutional theory is utilized to investigate the deeper aspects of social structure and describe the processes by which constructions such as norms, rules and routines are established as guidelines for the development of social behaviour. The theory examines how these foundations are created, adapted, and adopted (Scott, 2004b). Much of institutional theory was created during the early years of social sciences and insights were established by academics including Marx, Weber, Cooley, Mead, Veblen and Commons (Scott, 2001). One element of the work has shown how institutional arguments which are basically about social stability relate to a "particular set of social reproductive processes " and exhibit "stable designs for chronically repeated activity sequences" (Jepperson, 1991: 144-45). In order to highlight these processes, DiMaggio and Powell (1983) distinguished between "coercive, normative, and mimetic" processes of social reproduction.

Three elements that underlie institutional order were suggested as being the regulative, normative and cultural-cognitive factors (Scott, 1995). Regulative elements concern setting rules, monitoring activities and sanctioning actions. Normative elements add a prescriptive, evaluative and obligatory element into social life (Scott, 2008). While cultural-cognitive elements highlight the "shared conceptions that constitute the nature of social reality and the frames through which meaning is made" (Scott, 2008: 57). There is substantial variation in the variety of institutional order they sustain and each one uses different bases of order, reasons for compliance, mechanisms, logics of action and indicators (Socott, 2008). Each element demonstrates a different rationale for being legitimate; some are legally sanctioned, some are morally authorised and others are culturally reinforced (Scott, 2008). Therefore, there is a difference between complying due to expedience, for example, to avoid punishment and complying due to a feeling of moral obligation or due to a lack of an alternative kind of behaviour. However, each element contributes to an institutionalized social order involving stable behaviour. Institutional forms are built on cultural cognitive frameworks. Scholars including political scientists and institutional economists have given most attention to regulatory elements rather than the normative and cognitive factors, although it has been noted that despite being more visible, they can be more superficial than cognitive and normative factors.

It is easier to manipulate regulatory systems instead of complying with them (Evans 2004; Roland 2004). Individual institutions consist of different amalgamations of the institutional elements and they vary over time with different factors being prioritised. Research has to decide what elements exist in each particular context and whether they are reinforcing or acting against each other. There are various levels of analysis of institutional elements leading from interpersonal systems to national and world systems. Organizations consist of a number of institutional elements and certain beliefs; rules and norms are created during ongoing interaction while others derive from their environments. Most research has investigated environmental influences, examining how differing institutional structures and processes influence organisations (Scott, 2008). Despite institutional elements being symbolic, they are interesting as they are a source of cognitive schema, normative direction and rules of social behaviour. Interaction creates rules, norms and meanings which are maintained and modified by the actions of social individuals (Giddens, 1979). Through institutional theory (Scott, 1995, 2014), this study gives us a comprehensive, multi-layered knowledge of how religion affects innovation propensity and entrepreneurial characteristics. Tatli *et al.,* (2014) concluded that the characteristics of entrepreneurship, including innovation, are a group of interrelated qualities that can be affected by social and economic factors. The use of institutional theory gives a deep multi-level understanding by linking innovation and entrepreneurship with religion, values, societal norms, public policies and regulations.

In addition, in an examination of religion, innovation and entrepreneurship theory can be utilised to guide the selection of religious dimensions. Cornwall *et al.*, (1986) argued that religion works through three significant dimensions including cognitive, for example, religious beliefs, normative, for example, religious activities including attending a place of worship and regulative, for example, regulations and laws. Religious practices can be used to demonstrate the variation of people's degree of religiosity (Parboteeah *et al.,* 2009). An individual's greater attention to their beliefs would be reflected by their actions and attendance to a religious institution. This would be demonstrated by their attendance to religious services, praying and making financial contributions (Faulkner and DeJong, 1976). The cognitive element of religion relates to religious beliefs in supernatural forces and dogmas including the belief in life after death (Cornwall *et al.*, 1986). A high degree of faith

would be demonstrated by a strong adhesion to such a perspective. Being innovative also involves believing in the unknown and having faith as well as being motivated by a vision (Assouad and Parboteeah, 2018). The regulatory aspect of religion covers the rules, regulations and other principles that guide its' followers' behaviour.

Despite the fact that some studies have argued that religion limits the attitude towards innovation since religion discourages risk-taking while stimulating conventional decision-making (Jiang *et al.,* 2015), this study follows the viewpoint that the normative, cognitive and regulative dimensions of religion at the level of society positively affect individual's attitude to innovation and entrepreneurship. Our argument is based on several points. First, as regards the normative dimension of Islam, some research has shown that religions have strong roots of values and standards that encourage some important characteristics of social development and economic growth such as hard work, commitment, credibility and trust (McCleary, 2008). Some previous studies have proven that religion supports work ethics and perseverance that contribute to advancing innovation and entrepreneurship. Scott (1995) emphasized that norms and values, whether religious or social, have an impact on the behaviour of individuals towards innovation and other entrepreneurial characteristics (Krueger *et al.,* 2000).

Likewise, the values and norms found in the Holy Qur'an encouraged innovation and entrepreneurship, as God Almighty is an innovator, which encourages Muslims to be innovators imitating God, in addition, some prophetic hadiths encouraged Muslims to be open towards innovation (Al-karasneh and Saleh, 2010) Also, Islamic religious norms and values encouraged Muslims to engage in some economic activities such as trade, which are not without risks. This encourages Muslims to engage in dangerous activities and supports their entrepreneurial approach (Graafland *et al.,* 2006). The normative aspect also urged obtaining a high degree of experience and effort, which raises the level of self-efficacy among Muslim individuals (Bandura and Vozikis, 1994).

Secondly, as regards the cognitive dimension of Islam, the religion embraces belief in the supernatural, such as belief in heaven and hell. In similar ways, innovation often occurs through strong belief in supernatural ideas and new specific products. Strong and blind faith may require a high level of commitment, which is what innovation needs as it depends on

advocating and pursuing new ideas without conditions or restrictions (Walter, *et al.,* 2011). Therefore, this study suggests that the normative and cognitive dimensions of Islam contribute to creating a suitable environment for innovation and entrepreneurship. Having reviewed previous literature which indicates that religion contains entrepreneurial economic fundamentals and roots, this study believes that individuals who pursue innovative entrepreneurial ideas and methods are often from religious environments. Following from this argument, Islam supports the belief in the supernatural such as belief in heaven and hill (Al-Habeeb, 2003; Iannaccone, 2006). God Almighty says in SurhAal-'Imran, verse 84: ***"We believe in God and in what has been sent down to us, and what was sent down to Ibrâhim (Abraham), Ismâ'il (Ishmael), Ishâque (Isaac), Ya'qûb (Jacob) and Al-Asbât [the twelve sons of Ya'qûb (Jacob)] and what was given to Mûsa (Moses), 'Iesa (Jesus) and the Prophets from their Lord. We make no distinction between one another among them and to Him (God) we have submitted (in Islâm)."*** (Al- Hilali and Khan, 1996). This verse is proven that God almighty encourages Muslims to believe in the supernatural that God has given to the prophets (Asani, 2011). From an Islamic perspective, the strong belief in the future which doesn't stop at a particular moment is important for the development of innovation; equally, an important factor for creativity (Ahmed and Abdalla, 1999). God Almighty says in Surh Yunus verse 14: ***"Then We made you follow after them, generations after generations in the land, that We might see how you would work!"*** (Al-Hilali and Khan,1996). This verse is evidence that God Almighty encourages people to believe and think about the future and be open to new innovations. The second principle of the cognitive dimension is education, Mumford and Gustafson (1988, p.38) suggested that educational acquirement is important for innovation and entrepreneurship and said, "educational system that supports autonomy or builds self-esteem might increase the likelihood of innovative achievement". Equally, there is a strong relationship between education and innovation (Turpin *et al.,* 2009). Dejong *et al.,* (1976) confirm that one of the most important cognitive actors of religion is knowledge and it is one of the frequently measured factors of religion (Cornwall *et al.,* 1986). Islamic teachings encourage Muslims to obtain all types of knowledge through education that may help humankind to develop and contribute to the quality of life. Kaur (2013) stated that the new developments in sciences oblige Muslim scholars to deal with life's challenges by implementing appropriate solutions. The cognitive dimension of Islam showed its role in influencing internal locus of control

through beliefing in God and reliance on Him).a reliance on God could improve an individual's sense of internal locus of control and actually improve psychological consequences. Fiori and Antonucci (2006) suggest that both the objective parts of religiosity, for example, taking part in ritual, and the more subjective aspects, such as dependence on God, can give a sense of satisfaction and thus impact on internal locus of control (Fiori and Antonucci, 2006).

Third, regarding the regulative dimension of religion, Stenholm *et al.,* (2013) stated that the regulative dimension is the primary dimension of the institutional environment, and the major public regulations, legislations and policies of a state can support individuals either directly or indirectly in the innovation and entrepreneurship behaviours. This regulative dimension, which is connected with Islam, is favorable to innovation propensity (Suberu, 2009). One example of innovation that has been developed by Sharia in Muslim societies is Ijtihad. It can be defined as "the process as well as the mechanism by which the revealed law, in the Holy Quran and Sunnah may be interpreted, developed and kept alive in line with the intellectual, political, economic, legal, technological and moral developments of society" (Saeed and Salah, 2014 p.41). Ijtihad is an intellectual innovation which has been developed by Sharia to deal with new developments and it is considered to be an essential principle that helps to combat change (Zarifet *et al.,* 2013). Regulative diminution of Islam prohibits the earning of interest, usury, gambling, trading in unlawful goods and services (El-Gamal, 2001). On the other hand, it encourages the sharing of profits and low and mediates risk as part of the financial process. The vital value of Islamic banking systems is the sharing of profit and loss (Metwally, 1997). The main factors for successful innovation in the Islamic banking system that is based on Sharia law ideals of sharing risk indirectly create incentives for risk-taking as Rose-Ackerman (1980) confirms that risk-taking is essential to innovation and entrepreneurial activity. However, there are some challenges that may limit the innovation of Saudi women, such as the difficulty of accessing government services because Islamic Sharia obliges women to have a mahram for them in order to be able to obtain government services, as well as limiting the freedom of Muslim women to travel.

The section below summarises each paper (Paper 1, Paper 2 and Paper 3) of this thesis. The literature review and some important contributions of each paper are debated comprehensively in chapters 3, 4 and 5.

## 2.2 First paper:

This paper investigates the influence of Islamic religiosity on innovation propensity amongst Muslims adherents. Previous research in economy (Ayanian *et al*., 2015) and sociology (Miller, 2000) has investigated the relationships between economic growth and the beliefs and values of adherents of several religions. A famous argument was developed by Weber (1930) and emphasised by Parboteeah *et al*., (2003) who argued that the social norms of work-ethic include hard work and commitment are in fact followed by several religions. Despite innovation being influenced by numerous factors such as religion, differences exist between the consequences of various religions on innovation. Wang and Gan (2008) suggest that western religion tends to support innovation to a greater extent than eastern religion. Nevertheless, most of the existing literature that has investigated the relationship between innovation and religion was about Christianity and however, there is little literature researching the effects of the religion Islam. It is fruitful to understand the influences of religion on innovation propensity from an Islamic perspective. Therefore, this study follows Assouad and Parboteeah (2018) approach which has three dimensions of religion, normative, cognitive and regulative to illuminate the relationship between Islamic religiosity and the propensity of Muslims towards innovation within an Islamic country, Saudi Arabia.

The normative dimension of Islam is connected with norms, values and religious activity derived from the Holy Quran and Sunah. Verses from the Holy Quran affirm that God Almighty created the world from a void which is one of His innovations. God Almighty told the prophet Mohammad (pbuh) that humankind is the successor of him in this world and Muslims should be innovative following the example of Allah (God Almighty). In Surat Al-Baqarah, verse 30 God Almighty says: ***"And (remember) when your Lord says to the angels: "Verily, I am going to place (mankind) generations after generation on earth"***. In the exegesis of this passage, God almighty tells the prophet Mohammed (pbuh) that there is a successor who will work on the earth and that is required people to be innovative as they are the successor to God almighty (Matali, 2012). The cognitive dimension of Islam is primarily related to religious beliefs, including belief in Allah, messengers and angels as well as faith in the future and acceptance of the supernatural and secondary linked to education. Previous studies have established how these beliefs and education support innovation

propensity (Assouad and Parboteeah, 2018; Turpin *et al*., 2009). Furthermore, current studies revealed that the ministries of education in some Islamic countries had created new innovation programs in their universities. Finally, the regulative dimension of Islam is Sharia which comprises a set of rules and laws that control individual behaviours. The first example of innovation created by Sharia in Muslims' societies is Ijtihad. The definition of Ijtihad is "the process as well as the mechanism by which the revealed law, in the Quran and Sunnah may be interpreted, developed and kept alive in line with the intellectual, political, economic, legal, technological and moral developments of society" (Saeed and Salah, 2014 p.41). Muslim scholars consider Ijtihad to be one type of intellectual innovation. Furthermore, this research shows some innovation strategies in the Islamic banking system inspired by Sharia such as interest-free banking, Murabaha and sharing of risk-taking.

The three hypotheses of this research are that the normative, cognitive and regulative dimensions of Islam effect Muslims' innovation propensity positively. The findings of the linear regression (OLS) model indicate that Saudi Muslims with stronger religiosity in the normative, cognitive and regulative dimensions of Islam are more likely to be innovators which supports the paper hypotheses. This study examined the effects of the three dimensions of Islam on innovation propensity amongst Muslims in Saudi Arabia, one of the most famous Islamic countries.

The research concludes that innovation is a phenomenon that cannot be isolated from social and psychological factors such as gender. Several academic studies, including Ostergaard *et al.,* (2011) and Wood (1987) proved that gender has positive links with innovation and research on this theme has nearly doubled every five years (Harrison and Klein, 2007). Additionally, recently the links between gender and innovation have been studied by many different disciplines (Crowden, 2003; Kingiri, 2010; Johansson and Lindberg, 2011; Danilda and Thorslund, 2011). Therefore, it is vital to study how gender might affect the relationship between Islam and innovation propensity and therefore, the second paper investigates this relationship.

## 2.3. Second paper:

In the first paper, utilising the three dimensions of institutional theory, the relationship between Islam and innovation propensity among Muslims was observed from

an Islamic perspective. The aim of this paper is to extend this line of inquiry by examining whether gender might influence this relationship. Previous literature indicates that women are frequently more likely than men to identify with a particular religion, describe themselves as devotees and take part in private and public religious activities (Voas *et al*., 2013). Furthermore, the idea that men are less religious than women is a generalization that is correct both historically and around the world (Stark, 2002). However, the suggestion that women are often more religious is not a universal phenomenon. Schnabel (2018) stated that in the prevalent world religions of Islam and Judaism men seem to be both more religious and more spiritually active than women.

Previous literature shows a number of differences between men and women, variations in religion is amongst them. These variations could have many causes such as being socialization, having different psychological attributes including passiveness, submissiveness and obedience. Furthermore, the prevailing research suggests gender differences in innovation propensity. This included the suggestion that women often integrate their work activity with personal and family goals. Besides, the arrangement of female networks comprises less high-status, wealthy and influential members compared to male networks (McGuire, 2000). A further cause of gender differences in innovation is unequal access to finance for women compared to men during innovation attempts. One more reason is that women are considerably less likely than men to access a great range of education and training. Lack of education and training limits women's innovation because of shortages of the required skills and knowledge. Muslim females struggle to create networks that access markets are other limitations for them to be involved in innovation.

By including the normative, cognitive and regulative aspects of this discussion, it is possible to demonstrate a clear insightful understanding of these connections. Previous literature suggested that even though the normative aspect of Islam deals with men and women equally with regard to worship and encourages both equally to innovate more, limitations exist which prove challenging for Muslim women's innovation when compared to that of men (Yamani and Allen, 1996). In Islamic societies, women are not always encouraged to work outside their homes resulting in limitations of their knowledge and mobility. Nevertheless, the existing literature concerning regulative aspects of Islam shows that women have challenges that reduce Muslim women's ability to prosper in innovation

propensity compared to their counterpart Muslim men. Different financial rights and responsibilities leading to limitations in women's ability to innovate, compared to men who have a greater level of financial responsibility than women. Moreover, the male guardianship system by which the father, brother, son or husband of a woman makes serious decisions for her limits female innovation due to the lower amount of independence, freedom and the capability of traveling alone which in turn limits their innovative activities. While the cognitive aspect of Islam supports education for both genders, in some Muslim countries, the educational organizations create particular limitations which reduce opportunities for women's innovation.

To generate a deeper understanding, this study examines the influence of gender on the relationship between Islam and innovation propensity using the lens of institutional theory. The results of this study were consistent with the hypotheses as it was confirmed that Islam has a positive effect on innovation propensity in both Muslim women and men. Furthermore, we found that men have high levels of innovation propensity compared to women.

## 2.4. Third paper:

This paper highlighted and examined, first, the relationship between Islam and three entrepreneurial characteristics, risk-taking propensity, self-efficacy and internal locus of control. Second, it also examined the differences between Muslim entrepreneurs and non-entrepreneurs in these characteristics. Much of the available literature has agreed that risk-taking propensity, self-efficacy and internal locus of control are essential characteristics of entrepreneurs (Tyszka *et al.,* 2011). Ahmed (1985) found that entrepreneurs scored significantly higher than non-entrepreneurs in risk-taking propensity. Gürol and Atsan (2006) defined self- efficacy and internal locus of control as elements of most entrepreneurs' characters. However, while the literature has explored the relationship between entrepreneurs and several psychological characteristics, there has been less research into the ways religion, specifically Islam, influences this relationship. Therefore, this paper examined the effects of Islam on the three entrepreneurial characteristics in Saudi Arabia.

In this paper, Islam supports risk-taking propensity through two channels trade and networks. First, when entrepreneurs set up their ventures and start their trade activates, they need to take certain risks. Islam arguably might support risk-taking by inspiring Muslims to trade, although this may involve them in risky activities. Second, the results of this paper also established that Islam has a positive influence on Muslim risk-taking through the belief in networks. Network cooperation is one major ethical principle of Islam that encourages entrepreneurs to take part in risky activities. Cooperative networks support entrepreneurs in their society, providing them with knowledge and information and creating links between entrepreneurs. Networking can similarly create understanding and reconciliation between community members. Islamic networks provide entrepreneurs with financial support, as it is often difficult for the owners of small firms to obtain funding (Burt 1992). Thus, borrowing funds from a group within Islamic networks is a solution that allows them to take part in risky activities (Ahuja, 2000). The results of this paper support the first hypothesis of this paper which demonstrates that Islam has a positive influence on risk-taking propensity.

Moreover, this paper argues that Islam supports internal locus of control among Muslims. Islam enhances internal locus of control through relying on God (toakul) and believing in the fact that everything is His will. Toakul is an Islamic creed that refers to the belief that Muslims should trust God Almighty during their whole lives. Previous literature stated that trust in God and confidence are connected to internal locus of control (Pargament *et al.,* 1988). Spilka *et al.,* (1985) argue that subjective religious attributions, such as dependence in God (Toakul), can offer satisfaction and thus influence one's internal locus of control. The results of this paper supported the second hypothesis of this paper which claims that Islam has a positive influence on Muslims' internal locus of control.

Finally, the paper argues that Islam supports self-efficacy through the efforts Muslim individuals put into their work and the mastery experience that they achieved. The literature describes how individuals strengthen their beliefs about self-efficacy and advance through the practice of mastery. Bandura (1999) claimed that in order to gain a strong feeling of self-efficacy individuals need to repeat performance accomplishments and experience mastery.

From an Islamic point view, Muslims are inspired by their religion to work to a good standard that in turn leads to a positive mastery experience and, therefore, increases their level of self-efficacy. Allah says in the Holy Quran: ***"Allah loves that whenever any of you does something, he should excel in it".*** Additionally, Islam augments the quality of people's self-efficacy by encouraging their perseverance and effort since they are important to overcoming problems to acquire a robust and steady feeling of self-efficacy. The prophet Mohammed (pbuh) advises Muslims to practice effort and persevere saying "No one eats better food than that which he eats out of the work of his hand'' and said, "No earnings are better than that of one's own effort" (Ali and Al-Owaihan, 2008). Individuals with decent levels of self-efficacy are expected to take the initiative and persevere more often (Bandura, 1999). The results of this paper support the third hypothesis of this paper which maintains that Islam has a positive effect on self-efficacy. In conclusion, the paper's results showed that Islam is a durable and important supporter of entrepreneurship given its positive and clear influence on the most central characteristics of thriving entrepreneurship, viz risk-taking propensity, self-efficacy and internal locus of control.

# Chapter 3 (Paper1):

## The impact of Islamic religiosity on Innovation propensity

## Abstract

Research concerning the field of religion and economy has commonly ignored the impact of religion on innovation. Although few studies are available, it seems that there is less agreement about the relationship between religion and innovation when examining the phenomena among Muslims. The aim of the present study is to empirically examine the relationship between Islamic religiosity and innovation propensity in the context of one of the dominant Islamic countries, Saudi Arabia. This paper hypothesizes that there is a positive relationship between Islamic religiosity and innovation propensity. Based on a quantitative method to scrutinize data obtained by questionnaires addressed to Muslim individuals, the current study will use ordinary least squares (OLS) regression to test the study hypotheses. Islamic religiosity is the independent variable and innovation is the dependent variable. The study results indicate a positive effect between Islamic religiosity and innovation propensity among Muslims.

## 3.1. Introduction:

From the time of Adam Smith's novel contribution "The Wealth of Nations" in the mid-eighteenth century and Max Weber's "The Protestant Ethic and the Spirit of Capitalism" in the early twentieth century to more recent works (Audretsch *et al*., 2013), the argument as to how religion might influence economy is still under development. One example of this literature is Gundolf and Filsner (2013) who highlighted the findings in this area using a citation analysis considering 215 articles and 7,968 references cited to discover the structure of the quotations and reveal the publications that have influenced research most profoundly. They found that a large number of economic and management behaviors have their foundations in religious principles. Furthermore, Tracey *et al*., (2014) argue in their book "Religion and Organization Theory" that the role of religion in nearly every economy, management, organization and society is obvious and of major importance. While this argument has become of growing interest recently (Mellahi and Budhwar, 2010), the main principle of this research considers the relationship between one of the important components of economic development, that is innovation (Schumpeter, 1934) and religion.

Innovation, as an economic phenomenon, has been researched intensively in the literature. Du Plessis (2007, p.32) defines innovation as "Innovation has been defined as the development and implementation of new ideas by people who engage in transactions with others over time within an institutional context". In addition, Cox (2005, p.2) stated that innovation is "The successful exploitation of new ideas". Howell and Howell *et al*., (2005) argue that the creation of new ideas and actively pursuing them is amongst many characteristics of innovator behavior. However, without pursuing these new ideas, they would likely be neglected and ''remain dormant for future development and implementation'' (Frost and Egri, 1991, p.270). Considerable of the previous literature has examined innovation and entrepreneurship and it has suggested that innovation and entrepreneurship are closely connected (Schumpeter, 2000, Zhao, 2000, McDaniel, 2000). Stewartet (2003) argued that there is a strong relationship between entrepreneurs and innovation and described innovation as the single constitutive entrepreneurial function. Drucker argued that innovation is a vital part of entrepreneurship ( Gürol and Atsan2006). In addition, Ljunggren *et al*., (2010), Hage (2006) argue that innovation is an economic phenomenon that is certainly not isolated from social and psychological factors such as

gender and age. A number of academic studies, Ostergaard *et al*., (2011) and Wood (1987), have demonstrated that gender has positive links with innovation. Furthermore, it was demonstrated recently that older employees score lower on a number of innovation-related indicators including the propensity to innovate products, research and development spending and selling new products (Timmermans and Kristinsson, 2011). It was argued by Andersson and Klepper (2013) that older employees are less likely to adopt new technology and in addition, a number of studies have demonstrated that new firms employing younger workers grow faster. Moreover, Scott (2008) argued that religion and other institutions (e.g. culture, regulation and education) in a society are the main factors that influence individuals' attitudes towards innovation. While religion plays a major role in the lives of most individuals and has a significant influence on the economy, gaining an understanding of how religion influences innovation is particularly important as this has a vital role in promoting economic development (Maradana *et al*., 2017).

Despite the variation in the way religion impacts innovation, certain patterns can be observed from the available literature. Major world religions differ in their support of innovation; some studies have shown that predominantly Western religions are more supportive of innovation, whereas Eastern religions are generally less supportive (Wang and Gan, 2008). However, Islam is one of the principle Eastern religions. An important reason for investigating the relationship between Islam and innovation propensity is that there has been considerable debate about how Islam affects economic development. Some scholars suggest that Islam is a principal factor causing the economic stagnation of worldwide Islamic countries. They argue that Islam allows a reduced amount of freedom and restricts rights of proerty (Zelekha *et al*., 2014), that it results in insufficient organisations (Kuran, 2008), that the participation of women in the workforce is minimised (Perkins, 2003) and that important traits of entrepreneurs such as innovation propensity are discouraged (Rehman and ShahbazShabbir, 2010) as well as risk-taking (Bartke and Schwarze, 2008) and the embracing of an internal locus of control (Arslan, 2001). However, some academics argue the opposite and contend that Islamic teaching deals with many economic dimensions including business ethics (Graafland *et al*., 2006), justice, freedom and problem solving (Fontaine, 2008) all of which contribute to advancing the economy. There continues to be a gap in the literature about the extent that Islamic religiosity effects economic progress and

which mechanisms are involved. There is not enough empirical evidence to demonstrate whether Islam encourages or restricts economic development (Zelekha *et al*., 2014). Thus, the resolution of this research is to examine the relationship between religion and economic growth through probing one major part of the economic process: innovation propensity.

However, although the available literature has studied the connections between innovation propensity and religion in the context of Western societies, less research has focused on the influence of Islam on innovation propensity. Investigating the links between Islamic religiosity and innovation highlights the ways in which religion affects Muslims' beliefs and behaviors. Therefore, this research examines the connections between religion and innovation propensity from an Islamic perspective to address this gap, as Tracey (2012, p.88) noticed, stating that "the existing literature focuses overwhelmingly on Western Christianity, and seldom examines other faiths or parts of the world". Although there have been few studies that focused on innovation at the individual level (West and Farr, 1989 p.17), this study focuses on the relationships from an individual level.

In order to investigate this gap, the current study will utilize institutional theory to illustrate the relationship between Islamic religiosity and Muslims' attitude toward innovation. The research will examine precisely the influence of cognitive (beliefs and education), normative (values and norms), and regulative (rules and laws) dimensions of Islam on determinants of innovation propensity. The cognitive dimension of Islam is demonstrated through personal religious beliefs that show the existence of the divine; for example, the belief that God Almighty exists or the idea that there is life after death (Cornwall *et al*., 1986; Parboteeahet *et al.,* 2008; Weaver and Agle, 2002). The normative dimension of Islam is demonstrated characteristically through religious practice, which specifies how much importance individuals devote to religion. Most Muslim individuals demonstrate their normative religious values by being involved in religious ceremonies and festivals, praying in private, and contributing financially to their mosques. Lastly, Kostova (1997, p.180) defines the regulative dimension as those 'existing laws and rules in a particular national environment, which promote certain types of behaviors and restrict others'. The regulative dimension aims to maintain in society using rules, boundaries, laws and regulations (North, 1990; Williamson, 1991). One of the most important indicators of

the regulative aspect of an Islamic country is Sharia which sets down the laws and controls and directs the behavior of all Muslim individuals.

Although literature dealing with the relationship between economics and religion exists, there are fewer studies investigate the relationship between the major world religion of Islam and innovation propensity which is an important factor that affects the economy. The examination of this relationship could advance questions such as: What is the relationship between Islam, which follows the principles of one of the largest world religions, and innovation propensity. Thus, the present research will take the opportunity to explore such issues in one of the most central Islamic countries, specifically Saudi Arabia. It addresses a gap in the knowledge by using quantitative research methods and by engaging comprehensive measures of Islamic religiosity and innovation to gain a more profound understanding of the relationship between Islam and innovation. In order to answer the above question, the study involves the design of a suitable questionnaire to collect data from Muslim individuals that live in Saudi Arabia. The questionnaire is asking the respondents about their levels of religiosity and their attitudes towards innovation. The questionnaire data will be analyzed using STATA software which is an efficient method of analysis for quantitative research. To conclude, it is helpful to understand the mechanisms of individuals 'attitudes towards innovation, particularly from the viewpoint of religious influences on Muslims' behavior and beliefs.

The examination of the relationship between Islamic religiosity and innovation propensity will be undertaken in Saudi Arabia. The choice of the country in which to undertake the study was based on a number of considerations. First, the Kingdom of Saudi Arabia (SA) is one of the most famous Islamic countries and is governed by Islamic rules in all aspects of life (Mellahi, 2007). Second, it is identified with Islam and has a special religious status in the Islamic world as the place where the religion and its sacred text, the Holy Quran, were revealed and all its inhabitants adhere to Islamic religion (Ahmed, 2002). Therefore, it can be argued that Saudi Arabia is an appropriate context to explore the relationship between Islamic religiosity and Muslims' propensity toward innovation.

The main research question is: what is the relationship between Islamic religiosity and the propensity towards innovation. Three sub-questions were developed during the

study and within this objective, the focus on the sub-objectives contributed to developing the central relevant study question. The table below (2.1) describes both the corresponding research questions and sub-objectives.

Table (3.1): Research questions and objectives.

| Research Questions | Research Objectives |
|---|---|
| Q1: How does the normative dimension of Islam impact innovation propensity? | RO1: To examine the ways in which the norms of Islam influence Muslim attitudes towards innovation. |
| Q2: How does the cognitive dimension of Islam affect innovation propensity? | RO2: To investigate how aspects of the cognitive dimension of Islam influence Muslim attitudes towards innovation. |
| Q3: How does the regulative dimension of Islam impact innovation propensity? | RO3: To explore how the regulative dimension of Islam affects Muslim attitudes towards innovation. |

This paper is organized in a methodical manner to contain seven sections. Section 1 is an introduction to the first paper which includes an overview of the study and its aims and questions to be addressed, resulting in various objectives. Furthermore, in section 2, the available literature is discussed with a focus on the gaps where issues are not addressed. In section 3, explains the reasoning behind the methodology utilized in this research. In section 4, the data analysis is discussed as well as the empirical results and how the research hypothesis was tested. Subsequently, in section 5, there is a discussion of the findings of the research which are linked to the literature review. Section 6 presents the conclusions of the study and summarizes the principle limitations, contributions and recommendations of the researcher and suggestions for future studies. The following section will critically discuss the existing literature on the relationship between religion and innovation propensity.

## 3.2. Literature Review:

### 3.2.1. Innovation and Religion:

Religion is a very complex social phenomenon that has a wide variety of effects on economic growth and the wellbeing of a population. The original argument was developed by Weber (1930, 2002) and emphasised by Parboteeah *et al*., (2003) who argued that social norms of work-ethic which includes hard work and commitment is in fact followed by several religions. Benabou *et al*., (2015) confirms this argument by stating that in the economics literature, the principal mechanism that has been proposed to illustrate the influence of religion on economy is social norms, which mainly has positive effects. Furthermore, McClearly (2008) indicated that the strong values of some religions promote useful qualities, such as a strong work ethic, and emphasis the importance of the development of the social and economic spheres. One example of the influence of social norms on economy was provided by Guiso *et al*., (2003). Guiso and his colleagues using the World Values Survey showed that religious people were likely to be more trusting of others and they are more dependable and less likely to break the law or fail to pay taxes and accept bribes. Another example of the effect of social norms on the economy is that beliefs in heavenly rewards and penalties can persuade people to act less selfishly and more cooperatively (Vindigni, 2015). This can lead to specific beliefs becoming socially self-sustaining. Thus, social attitudes associated to religiosity can be advantageous and produce improved productivity and progress. However, this conclusion is not without opponents. Weaver and Agle (2002, p.77) state that "Much empirical research in the psychology and sociology of religion indicates that religiosity does not automatically lead to ethical behavior". Hegarty and Sims (1978, 1979) confirmed that there is no relationship between a person's religious orientation and ethical behavior.

While religion supports work ethics (Weber, 1930; Benabou *et al.,* 2015), religion promotes belief in the supernatural such as belief in heaven and hell (Iannaccone, 2006). Another social phenomenon that supports belief in the supernatural and has a strong relationship with religion is innovation (Assouad and Parboteeah, 2018). The first link between religion and innovation propensity is that they tend to demonstrate faith in the supernatural. For instance, innovators frequently require faith in the supernatural idea as

well as they need to present their exceptional ideas throughout the process of successful innovation (Walter *et al*., 2011). The second link between religion and innovation is network building which is vital for an effective functioning of communities and societies (Maillat and Leco, 1992). A social network is an important part of being engaged in a religious society and the capacity to develop social capital exists which is essential to innovative workers (Maillat،1995). Moreover, religious communities constitute a primary marketplace to exchange ideas and create partnerships and associations. These elements are essential qualities necessary for effective innovation (Dakhli and De Clerq, 2004). Walter *et al*., (2011) and Maillat (1995) stated that individuals who regularly meet in their spiritual communities should develop patterns of socialization that benefit their efforts towards innovation. These links might result positively in the development creation of norms that promote acts of innovation (Dakhli and De Clerq, 2004).

To expand knowledge about the links between religion and innovation, Bénabou *et al.,* (2015) identified that there is a relationship between western and eastern religions and innovation propensity. Wang and Gan (2018) stated that both Eastern and Western religions promote attitudes toward innovation. They argue that the mechanism of motivation which plays a vital role, does not vary between the principles of different religions, specifically Western and Eastern religions and similar results are achieved. However, Lei (2016) indicates that Western religion promotes innovation propensity more effectively than Eastern religions despite the common motivation mechanism which plays an essential part in the influence of innovation propensity. Western religions additionally enhance the trust of interpersonal relationships, the accumulation of social capital and the idea of a long-standing vision demonstrated by the greater impact of western religion on innovation propensity (Wang and Gan, 2018).

Although the previous literature shows that religion has a positive relationship on innovation propensity, Benabou *et al.,* (2015), in contrast, discovered that there is a significant negative association between religion and attitude toward innovation across a number of countries as well as in the United States of America. On the same argument, Schwartz and Huismans (1995) discovered between members of a number of Western religions that religiosity is related negatively with openness to innovation and changing values. Another negative aspect of religion is that religion might encourage individuals who

work in companies to consider that they are superior and morally enhanced compared to others. These workers who feel superior due to their religion may feel less need to improve their practices and, thus, have less propensity to innovate (Staw, 1991). Furthermore, Rehman and Shabbir (2010) stated that new ideas and new methods need to be closely linked to spiritual and religious beliefs. For instance, in 2003, Barbie dolls which were innovative toys, were banned by the Saudi Arabian government for religious reasons (Shirazi, 2010). Columbia Broadcasting System (CBS) reported that dolls, with their revealing clothes and shocking postures, were found to be a threat to Islamic morality and were offensive to Islam teachings (Azam *et al*., 2011). Furthermore, in Christianity, Catholic Church and other religious institutions are educated to be against the use of birth control, as it is mentioned in the Bible teachings that this action is against God'swill (Brushaber, 1991). Kalliny and Hausman, (2007) emphasised this argument by stating that some religious groups disdain modern innovations as they find it a threat to their traditional approaches. They similarly avoid modern medical procedures as they believe that they might interfere with the will of God. Brushaber (1991) demonstrated that the innovation propensity in countries with fewer religious adherents is greater than in countries with more religious adherents.

Since the existing literature concerning the association between religion and innovation propensity is inconsistent, therefore it is useful to highlight the interface between religion and innovation propensity. Thus, the subsequent segment of this research examines this association from a Muslim point of view as Tracey (2012, p.88) stresses that "the existing literature focuses overwhelmingly on Western Christianity, and seldom examines other faiths or parts of the world."

### 3.2.2. Innovation and Islam:

In Islam, the Holy Quran is understood to comprise the precise words of Allah, as exposed through Angel Gabriel and delivered to the prophet Mohammed (pbuh). The Sunnah contains all, apart from the Quran, communicated by the prophet Mohammed (pbuh): his sayings and his actions (Ansary, 2008). However, any new idea in contradiction of the teachings of the Quran and the Hadith is called Bid'ah (Singh, 2012, p.600; Zarif *et al.,* 2013). Most Islamic scholars (Ghazali, 2010), Muhtadin and Ritonga (2018) started to

differentiate between permissible innovations and prohibited innovation that is evil or faulty and, even more, developed scales for measuring the acceptability of innovation were created. While any new innovation in Islam is suspected to be ***Bid'ah*** if it is contrary to the Holy Quran and Sunnah's teachings, however, innovation is not rejected by Islam. This is proven by Allah being the Innovator, a quality which Muslims are supposed to imitate. Mellahi and Budhwar (2010) stated that Islam is a religion fits any place and time with global impact that is historically successful. This has made Islam a mobile idea as it is easy to understand and flexible enough to meet society's changing needs.

Modern Muslim scholars have identified the need for Muslims to gain knowledge and, more specifically, on the economic area, innovation knowledge in a Muslim context. Ghazali (2010) affirms that this neglected angle of Islam is not given enough attention by many Muslim writers and academics. Few scholars have stated that few attempts are frequently made to explore innovation from an Islamic perspective and yet only some achieved a reliably scientific discussion and understanding the principles of the Islamic viewpoint on innovation (Al-Karasneh and Salah, 2010).

Although previous literature indicates that Islam supports the approach of Muslims to innovation, the argument is not without opponents. Some studies argue that Islam prevents Muslims from moving towards innovation and that it is an inflexible religion as regards the acceptance of innovations. They quote the prophet's hadith prophet Muhammad (pbuh) Hadeeth: that all innovations are misguidance and all misguidance results in hellfire (Asyari, 2007; Zarifat, 2013). However, this hadith was misunderstood as the people who did not have the opportunity to learn the interpretation of the Holy Quran interpret this hadith as a deterrent to all activities of innovation and suggesting that Muslims are discouraged to think and act innovatively whereas this hadith forbids innovation in religion, such as changing the number of daily prayers or changing fasting hours in Ramadan (Zarifat, 2013). The main factor in a misunderstanding of the Islamic interpretation of innovation is the lack of education in the interpretation of the Holy Quran which might cause them to interpret the verses of the Holy Qur'an and the prophet Mohammed (pbuh) hadith in a wrong way (Lala, 2012). Muslim scholars who have a good education and knowledge have a respectable comprehension of the Quranic central ideas and are able to understand the whole meaning and use of verses in the changing world

(Abukari, 2014). It is more likely for a Muslim who is well educated in interpretation to understand and interpret Quranic verses correctly and stand away from the wrong interpretation that might be ambiguous (Lala, 2012). As Jansen (1980) suggests, having an adequate level of education in the interpretation of the Holy Quran allows for an increased appreciation of religious writings and provides people with the skill to interpret the texts more confidently. Similarly, Iannaccone (1998) confirmed that an advanced education in the interpretation of Quranic verses and hadiths is significant for comprehending religious wisdoms and traditions. Furthermore, education provides people with essential skills to analyze religious texts as these texts are essential to their lives. Thus, it is possible to argue that highly educated Muslims are more likely to understand the meanings of religious texts as well as the Islamic legislation surrounding innovation and be involved in innovative activities (Halstead, 2004).

Another example of research opposing the argument that Islam supports Muslims' tendency to innovate is Bishara (2004) who mentioned that Islam restricts attitudes towards innovation. Moreover, Bishara added that the prevailing trends of Islamic culture, extremism, and tribalism impede Innovative behavior. In addition, Bishara (2004) emphasised that the ethical limitation of the relationship between the two genders, male and female, imposed by Islam is one of the most important constraints to innovation. Furthermore, among the opponents is Zilfi (1986) who indicates that throughout the years people believed that any innovations were undesirable in Islam. Over the centuries, the issue of innovation as sin remained alive. Islam proposed to eliminate any innovations in, for instance, clothing, behaviour, and construction. Ghazali (2010) indicates that Islam did not halt the trend towards innovation, nor did it prevent any innovation that helps and develops humanity such as innovation in architecture, engineering, science and medicine, and this is what Islamic civilization is looking for in all its ages. However, Ghazali emphasis that Islam prevented innovation that changed the system of prayer in mosques. Another example, Philips (1994), confirmed that Islam prohibited the innovation of building shrines around cemeteries because this innovation will lead to the worship of these shrines which is considered a religious innovation that is forbidden by Islam. Despite the positive effect of religion on economic development Barro and McCleary (2003) and that religion is recognized as a major influence on society and culture (Parboteeah *et al*., 2009, Ronen and

Shenkar, 2013), it is surprising that there have been few studies on how Islam may have influenced innovation propensity. Most of the research is either anecdotal (Kamrava, 2011), limited to small regions (Berkey, 1995), historical (Ghazali, 2010) or about a specific type of innovation (Azam *et al*., 2011). Therefore, this study attempts to build an inclusive knowledge concerning the connections between Islam and innovation propensity utilizing institutional theory. This study is intended to fill this gap in knowledge utilizing quantitative research methods and by measuring levels of religiosity and innovation propensity in order to find a more profound understanding of the connections between Islam and innovation propensity.

## 3.3. Conceptual framework and hypotheses development: The relationship between Islam and Innovation propensity:

### 3.3.1. Institutional theory:

Institutional theory is utilized to investigate the deeper features of social construction and describe the methods by which constructions such as norms, rules and routines are established as guidelines for the development of social behaviour. The theory examines how these foundations are created, adapted, and adopted (Scott, 2004b). Much of institutional theory was created during the early years of social sciences and insights were established by academics including Marx, Weber, Cooley, Mead, Veblen and Commons (Scott 2001). One element of the work has shown how institutional arguments which are basically about social stability relate to a "particular set of social reproductive processes" and exhibit "stable designs for chronically repeated activity sequences" (Jepperson 1991: 144-45). In order to highlight these processes, DiMaggio and Powell (1983) differentiated between "coercive, normative, and mimetic" procedures of social norms. Three elements that underlie institutional order were suggested as being the regulative, normative and cultural-cognitive factors (Scott, 1995). Regulative elements concern setting rules, monitoring activities and sanctioning actions. Normative elements add a prescriptive, evaluative and obligatory element into social life (Scott, 2008). While cultural-cognitive elements highlight the "shared conceptions that constitute the nature of social reality and the frames through which meaning is made" (Scott, 2008: 57). There is substantial variation

in the variety of institutional order they sustain and each one uses different bases of order, reasons for compliance, mechanisms, logics of action and indicators (Scott, 2008). Each element demonstrates a different rationale for being legitimate; some are legally sanctioned, some are morally authorised and others are culturally reinforced (Scott, 2008). Therefore, there is a difference between complying due to expedience, for example, to avoid punishment and complying due to a feeling of moral obligation or due to a lack of an alternative kind of behaviour. However, each element contributes to an institutionalized social order involving stable behaviour. Institutional forms are built on cultural cognitive frameworks. Scholars including political scientists and institutional economists have given most attention to regulatory elements rather than the normative and cognitive factors, although it has been noted that despite being more obvious, they can be more on the surface than cognitive and normative factors.

It is easier to manipulate regulatory systems instead of complying with them (Evans 2004, Roland, 2004). Individual institutions consist of different amalgamations of the institutional elements and they vary over time with different factors being prioritised. Research has to decide what elements exist in each particular context and whether they are reinforcing or acting against each other. There are various levels of analysis of institutional elements leading from interpersonal systems to national and world systems. Organizations consist of a number of institutional elements and certain beliefs; rules and norms are created during ongoing interaction while others derive from their environments. Most research has investigated environmental influences, examining how differing institutional structures and processes influence organisations (Scott, 2008). Despite institutional elements being symbolic, they are interesting as they are a source of cognitive schema, normative direction and rules of social behaviour. Interaction creates rules, norms and meanings which are maintained and modified by the actions of social individuals (Giddens, 1979). In an examination of religion and innovation, theory can be utilised to guide the selection of religious dimensions. Cornwall *et al.*, (1986) argued that religion works through three significant dimensions including cognitive, for example, religious beliefs, normative, for example, religious activities including attending a place of worship and regulative, for example, regulations and laws. Religious practices can be used to demonstrate the variation of people's degree of religiosity (Parboteeah *et al*., 2009). An individual's greater attention

to their beliefs would be reflected by their actions and attendance to a religious institution. This would be demonstrated by their attendance to religious services, praying and making financial contributions (Faulkner and DeJong, 1976). The cognitive element of religion relates to religious beliefs in supernatural forces and dogmas including the belief in life after death (Cornwall *et al.,* 1986). A high degree of faith would be demonstrated by a strong adherence to such a viewpoint. Being innovative also involves believing in the unknown and having faith as well as being motivated by a vision (Assouad and Parboteeah, 2018). The regulatory aspect of religion covers the rules, regulations and other principles that guide its' followers' behaviour.

Understanding the ways in which Islam can influence Muslims' attitudes and behaviors provides important knowledge of individual innovation. Figure (2.1) illustrates how institutional theory is used in this research to demonstrate Islam's effects on innovation propensity. The details of the framework are described in the following section.

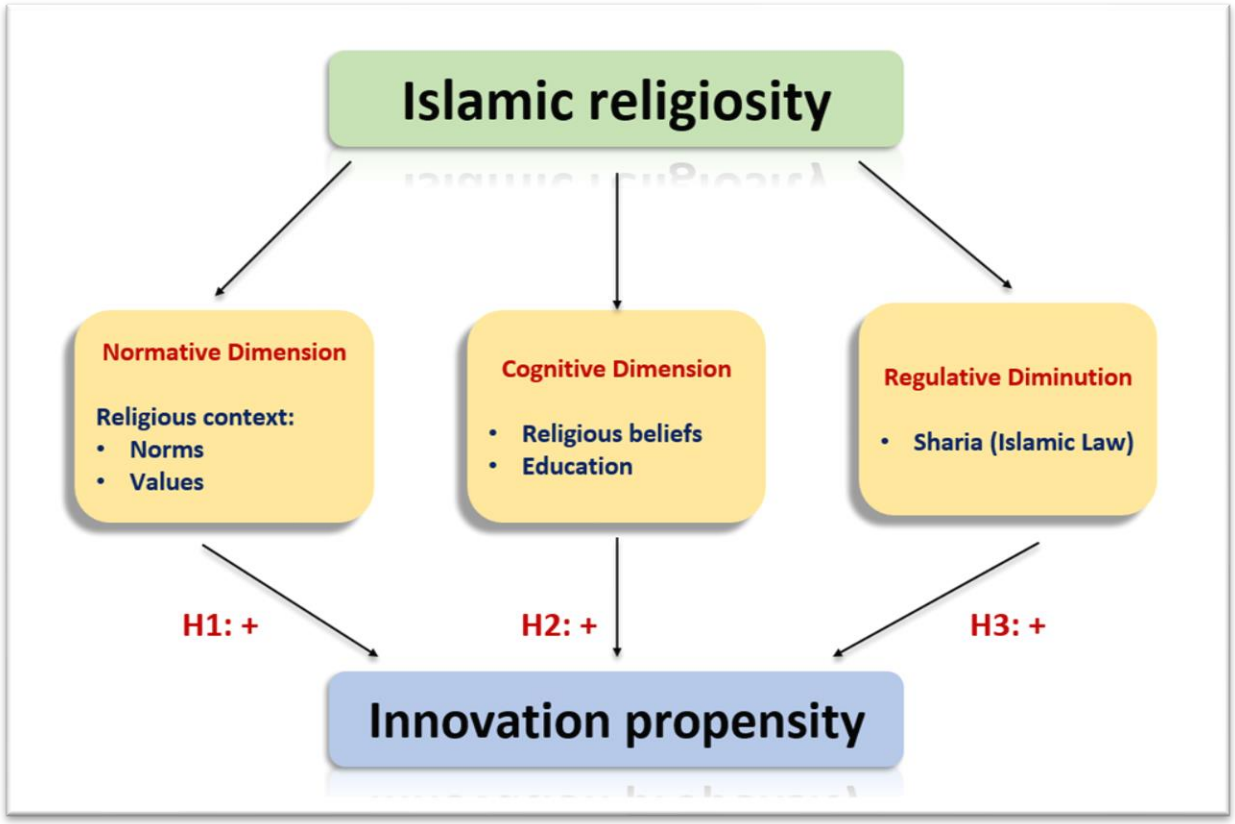


Figure 3.1: Conceptual framework and hypothesis development.

### 3.3.1.1. Normative Dimension:

The normative dimension of religious institutions is typically revealed through norms, values and religious activities that demonstrate to what extent individuals are devoted to their religion. Most religious adherents exhibit their normative religious principles by taking part in religious festivals and ceremonies (e.g. Ramadan in Islam), prayer and donating financially to their mosques and other religious identities (Kostova, 1971). Scott (1995) confirms that values and norms are considered as critical factors that form an individual attitude. For example, a number of studies show that the normative dimension of religion, manifest in internalized activities, has a positive relationship with innovation such as networking (Maillat and Leco, 1992), job responsibility (Parboteeah *et al*., 2009), both being significant for successful innovators (Lipparini and Sobrero, 1994).

From an Islamic perspective, Islam is not just a collection of religious norms, it gives guidance and evidence, norms and rules of conduct from the Holy Quran and Sunnah for people during their business, social and private lives. Moreover, Muslims' behaviors are influenced by the Holy Quran and the Sunnah (Shakona *et al.,* 2015). The Holly Quran urges innovative behavior by advising Muslims to walk on the earth and visit different areas, using all their faculties to discover the facts and to study the natural laws and use them to benefit their lives. God almighty says in Surh Al-'A'raf verse 10: ***"We give you an authority on the earth and appointed you therein provisions (for your life). Little thanks do you give"***. Al-Hilali and Khan (1996) argue that God almighty gave people authority in the world and eased their path and advised them to innovate and discover in the way of working and imagining new ways of living. Similarly, God almighty generated the world and the heavens which is one of God's talents of innovation and the successor to God almighty on earth is mankind (Whelan, 1998). In Surat Al- Baqarah, verse 30 God Almighty states: ***"And (remember) when your Lord says to the angels: "Verily, I am going to place (mankind) generations after generation on earth."*** (Al-Hilali and Khan, 1996). In the exegesis of this passage, God almighty tells the prophet Mohammed (pbuh) that there is a successor who will work on the earth and that is required people to be innovative as they are the successor to God almighty (Matali, 2012). There is further evidence from the Hadeeth; Imam Muslim (a Muslim scholar) explained that the prophet Mohammed (pbuh) said: the person who tries to make a permissive innovation in Islam is rewarded as well as person's followers until the

Day of Judgment (Al-karasneh and Saleh, 2010). Although the verses of the Holy Qur'an and Sunnah have made it unambiguous that it is possible and likely that the normative aspect of religion urges innovation, Muslims 'assimilation of these verses may differ according to their different cultures and educational level. Iannaccone (1998) argues that these religious assimilations that resulted from cultures and education make the results unexpected.

The previous literature demonstrates that the normative dimension of Islam might encourage useful innovation by Islamic values and norms. For the above reasons, the normative dimension of Islam is more likely to promote innovation propensity. Thus,

***$H_1$: There is a positive relationship between the normative dimension of Islamic religiosity and innovation propensity.***

### 3.3.1.2. Cognitive dimension:

This cognitive dimension of religion is confirmed by two principles, namely religious beliefs and education. First, the cognitive dimension is connected to the philosophical characteristic of religion demonstrated through the expectations about religious ideas, including, for example, the belief in the significance of God Almighty (Parboteeah *et al.,* 2008a; Weaver and Agle, 2002) and that God is real or the concept that there is life after death (Cornwall *et al.,* 1986). From an Islamic perspective, the strong belief in the future which doesn't stop at a particular moment is important for the development of innovation; equally, an important factor for Creativity (Ahmed and Abdalla, 1999). God Almighty says in Surh Yunus verse 14: ***"Then We made you follow after them, generations after generations in the land, that We might see how you would work!"*** (Al- Hilali and Khan, 1996). This verse is evidence that God almighty encourages people to believe and think about the future and be open to new innovations.

While innovation supports the belief in the supernatural (Assouad and Parboteeah, 2018), Islam supports the belief in the supernatural such as belief in heaven and hill (Al-Habeeb, 2003; Iannaccone, 2006). God Almighty says in SurhAal-'Imran, verse 84: ***"We believe in God and in what has been sent down to us, and what was sent down to Ibrâhim (Abraham), Ismâ'il (Ishmael), Ishâque (Isaac), Ya'qûb (Jacob) and Al-Asbât [the twelve sons of Ya'qûb (Jacob)] and what was given to Mûsa (Moses), 'Iesa (Jesus) and the***

***Prophets from their Lord. We make no distinction between one another among them and to Him (God) we have submitted (in Islâm)."*** (Al- Hilali and Khan, 1996). This verse is proven that God almighty encourages Muslims to believe in the supernatural that God has given to the prophets (Asani, 2011). The link between Islam and innovation propensity can be seen through religious Muslims who demonstrate faith in the supernatural are more innovative. For instance, innovators frequently require faith in supernatural ideas throughout the process of successful innovation (Walter *et al.,* 2011).

The second principle of the cognitive dimension is education attainment (Hargreaves, 2003). Dejong *et al.,* (1976) confirm that one of the most important cognitive actors of religion is knowledge and it is one of the commonly measured factors of religion (Cornwall *et al.,* 1986). The importance of knowledge and education in Islam is obvious from the fact the appeal to read is made at the start of the Holy Quran ***"Read"*** as shown to the prophet Mohammed (pbuh) (Alwani, 1995). God Almighty says in the Holy Quran: ***"Read! In the Name of your Lord, Who has created (all that exists), [Who] has created man from a clot (of coagulated blood), Read! And your Lord is the Most Generous, Who has taught (the writing) by the pen [the first person to write was Prophet Idrees (Enoch)], [Who] has taught man that which he knew not.(Surh Al-Alaq, verse 1-5)."*** (Al- Hilali and Khan, 1996). The value of knowledge is obvious when Allah desires the prophet Mohammed (pbuh) to pray for the gaining of knowledge in the subsequent verse of the Holy Quran***: "[Mohammed] say: My Lord! Increase me in knowledge (SurhTaha, verse 114)"*** (Parker, 2002). These verses show that everything individuals know is limited so they must find methods to improve their understanding. Günther (2006) stated that the prophet Mohammed (pbuh) personified the ideal of a teacher, by instructing his followers to practice correct religion and to witness Islamic principles in their behaviour. (Elyas and Picard, 2010). For example, the prophet Mohammed (pbuh) stimulated all Muslims to be educated and look for knowledge by saying: "Seeking knowledge is an obligation upon every Muslim." Similarly, the prophet said, "He who goes forth in searching for knowledge is in the way of Allah till he returns" (Al-Tirmidhi, 1986, p. 78).

Mumford and Gustafson (1988, p.38) suggested that educational acquirement is important for innovation and said, "educational system that supports autonomy or builds

self-esteem might increase the likelihood of innovative achievement". Equally, there is a robust association between education and innovation (Turpin *et al*., 2009).

Islamic teachings encourage Muslims to gain a wide variety of knowledge through education that might help individuals to improve their lifes. Kaur (2013) stated that the new scientific developments require Muslim academics to meet modern problems through applying suitable solutions. For example, in the area of medical education, Islam has encouraged Muslims to create new innovative educational methods that have contributed to the discovery of proper treatment of various diseases. Faruqi (2006) indicates that leading research into discovering more medical treatments are the obligation of humankind that motivates Muslim scholars (e.g.Ibnal-Haytham, Ibn SinaAlRazi and al-Farabi) to discover more medical treatment for diseases. Much of these motivations to approach advanced health practice and medical knowledge can be derived from the prophet (Pbuh) Hadeeth "There is no disease that Allah has created, except that He also has created its treatment" (Isgandarova, 2005 p.91).

To extend the argument about education and how it effects innovation pr0pensity, in Islamic countries, it is important to know that the cognitive capabilities and skills are obtained from educational institutions (Ritchie *et al.,* 2015). While these institutions have an important role in teaching innovation and Creativity, education in Islam is useful to create this knowledge (Pittaway *et al.,* 2011). Therefore, the Ministry of Education in a number of Islamic countries recognizes the significance of innovation and began including some progressive programs organised by an Islamic organization called The Research Council (TRC) with the objective to encourage innovation propensity in the public education sector (TRC, 2016). Moreover, The Ministry of Education and the Islamic Research Council have inaugurated the Academic Innovation Assistance Project that intends to give academicians and students capability in innovation.

Although the previous literature indicates that the knowledge side in Islam may suggest a positive impact on innovation, it is hard to confirm these expectations as a fact that the knowledge side contains any beliefs that may change. Kersting (2003) emphasizes that an individual might make decisions in life depending on religious ideas, however, when factors of an individual's life struggle with religious principles, it might be a challenge to resolve the two. Therefore, beliefs may change and be renewed. In addition, other

individuals may be encouraged to believe particular ideas through partners, friends or family and feel beholden to support these ideas, despite the fact that they vary from individual beliefs. For the former discussion, the cognitive dimension of Islam is more likely to promote innovation. Thus,

***$H_2$: The cognitive dimension of the Islamic religion is positively related to innovation propensity.***

### 3.3.1.3. Regulative dimension:

The regulative dimension can be demarcated as the current laws and regulations in a specific environment, which enhance specific behaviours and limit other behaviours (Scott, 2008). It attempts to protect stability and order in a community through established rules, restrictions, laws and policies (North, 1990; Williamson, 1991). As suggested by Finke (1990) and Starke and Fink (2000), the regulative feature of religion is established by government regulation of religion. An important sign of the regulative dimension of an Islamic country is Sharia which creates laws and controls the behavior of individuals.

Stenholm *et al.,* (2013) stated that the regulative dimension is the primary dimension of the institutional environment, and the major public regulations, legislations and policies of a state can support individuals either directly or indirectly in the innovation behaviours. This regulative dimension, which is connected with Islam, is favorable to innovation propensity (Suberu, 2009). One example of innovation that has been developed by Sharia in Muslim societies is Ijtihad. It can be defined as "the process as well as the mechanism by which the revealed law, in the Holy Quran and Sunnah may be interpreted, developed and kept alive in line with the intellectual, political, economic, legal, technological and moral developments of society" (Saeed and Salah, 2014 p.41). Ijtihad is an intellectual innovation which has been developed by Sharia to deal with new developments and it is considered to be an essential principle that helps to combat change (Zarifet *et al.,* 2013). Al-Baji, a traditional Muslim scholar, describes ijtihad as using the best intellectual capacity to find the correct ruling necessitating complete scholarly effort on the part of each individual legal scholar in trying to form a personal opinion about a new issue or new idea (Innovation) (Abd-Allah, 2006). Moreover, Muslim scholars argue that Ijtihad is inclined to be more flexible and less controlling to issues that are not concerning religious subjects such

as issues concerning God, metaphysics or things that are related to the central pillars of Islam (Ahmed, 2015). However, to practice Ijtihad in the religious arena requires the satisfaction of several conditions. Only people who have met strict criteria can take part and the outcome must be validated by the religion (Saeed, 1997).

The notion of Ijtihad is frequently seen as intellectual innovation and some of Muslim scholars believe that Ijtihad is the chief vehicle that drives innovation and Creativity in Islam. The intellectual and critical endeavors which Muslim scholars and scientists have participated in resulted in the progress of Islamic civilization, mostly due to the protective implementation of Ijtihad which is encouraged and authorized by Islamic law. Therefore, a number of Muslim scholars have studied Ijtihad from a variety of perspectives, particularly within its innovative role in reform and renewal (Abdullah *et al.,* 2013; Codd, 1999). Likewise, there were many hadiths that demonstrated the importance of ijtihad, and among these hadiths was the saying of the prophet Muhammad that “Allah will raise for this community at the end of every hundred years the one who will renovate its religion for it” (El Fiky, 2019.p8).

The second example of innovation created by Sharia in Muslims societies is Islamic banking. Islamic banking, in particular, and the Islamic financial system, in general, is a set of rules that prevail over cultural areas, economic, political and social features of Islamic communities, collectively referred to as Sharia. Islamic banks are commercial enterprises which largely conform to the religious principles of Islam (Kahf, 1999). They are different from Western banks in that their guiding philosophies, like the Islamic financial system, coming from the Islamic Sharia. There are two main methods that lead Islamic banking towards innovation.

First, Sharia in Islam prohibits the earning of interest, usury, gambling, trading in unlawful goods and services (El-Gamal, 2001). On the other hand, it encourages the sharing of profits and low and mediates risk as part of the financial process. The vital value of Islamic banking systems is the sharing of profit and loss (Metwally, 1997). The main factors for successful innovation in the Islamic banking system that is based on Sharia law ideals of sharing risk indirectly create incentives for risk-taking as Rose-Ackerman (1980) confirms that risk-taking is essential to innovation. Second, Islam encourages people to help each other solve their problems as the prophet Muhammad (pbuh) said, "If anyone fulfills his

brother's needs, Allah will fulfill his needs; if one relieves a Muslim of his troubles, Allah will relieve his troubles on the Day of Resurrection" (Al-madarme, 2020, p.8). This can be seen more clearly when interest-free Islamic banking was developed in the social Bank sector (Mayer, 1985). The appearance of interest-free banking encourages Muslims to take loans and start their innovative projects. Powell and Grodal (2005) affirm that easy access to financial resources is important for innovators and help them to develop their projects. The appearance of interest-free banking can be seen as a major economic innovation for a number of reasons. The initial reason is that interest-free banking allows for the arbitration of an independent financial advisor without payment or the receipt of interest which was at the Centre of the previous financial services. Another reason for considering Islamic interest-free banking as an economic innovation is that the financial methods that Islamic banks used are renewed by Islamic scholars. The Islamic scholars have comprehensively improved these unique jurists' to link them with modern economic environments and the new circumstances within which Islamic banks need to operate (Kahf and Khan, 1992).

For these above reasons, the regulative dimension of Islam is more likely to promote innovation. Thus,

***$H_3$: The regulatory dimension of the Islamic religiosity is positively related to innovation propensity.***

To conclude, religion is a complex social phenomenon and reluctant to reach affirmed conclusions. For example, there are several complexities and issues in gauging religion and spirituality that have not been solved at present, many of them have been debated in the literature (e.g., Hill, 2000; Kirkpatrick and Hood, 1990; Pargament, 1999). Studying religion is not an easy task, and the expected results from the study that investigates religion are hardly to be confirmed. Moreover, such clear results and assumptions about causal relationships are hardly ever the case in the social sciences (Slater and Edwards, 2001).

This section has analysed the current literature on religion and innovation and more specifically about the issues surrounding Islam and innovation. Evidence for how Islam encourages innovation has been shown from the Holy Quran and the Sunnah. The three dimensions of Institutional theory have been used to examine evidence of the positive

impact of Islam on innovation. Thus, the following section describes the research methodology supporting the present study, with guidance to the study approach, design and related methods of gathering information and analysis.

## 3.4. Methodology:

This chapter examines the research methodology supporting this research, with paradigmatic assumptions resulting in an approach, design and appropriate methods of data collection and analysis which will allow a more profound understanding of the subject. Following the statement of Easter by-Smith (2012), that the methodology of a study should answer certain questions about how a researcher can produce knowledge about a society and what are most suitable methods that can be used to demonstrate this information. Furthermore, the philosophical assumptions are closely connected to the methodological process. Thus, the methodology described in this chapter comprises both the philosophical framework and the methods selected to complete this research

### 3.4.1. Research philosophy and paradigms:

#### 3.4.1.1. Ontology:

The ontological factor must be established. This concerns questions about the nature of reality and the set of concepts and categories in the subject area and their properties as well as the relations between them, thus demonstrating the researcher's assumptions about how the world operates. Duberley *et al.,* (2012, p.17) define it as *"the essence of the phenomenon and the nature of its existence"*. It is necessary to define the assumptions of the researcher about the nature of reality (Easterby-Smith *et al.,* 2012). In order to examine if a phenomenon being studied exists separate from people's knowledge and perception or occurs as a result of being aware of the phenomenon, it is vital to make clear the decisions the researcher has made (Symon and Cassell, 2012). There are two principle schools of thought about social reality; the realist and the social constructionist (often known as the objectivist and subjectivist schools of thought). The first of these maintains that the world and social units exist in reality outside the social participants and are independent to the cognitive construction. However, in contrast, Subjectivism takes the position that a given social phenomenon or reality is formed as a result of an individual's perspective and is primarily concerned with both the existence of the phenomenon and the actions of the individual in society (Collis and Hussey, 20013). These challenges the opinions of the positivist, who maintains that the world is static and has its own reality. On the other hand,

reality develops in nature according to subjectivist beliefs; for them, reality is extremely diverse and is created socially. Individuals make sense of situations and develop their ideas as part of a social group, through their day-to-day interactions and by considering their own experiences (Martin and Sugarman, 1996).

This study examines the ways in which Islam influences innovation, using institutional theory and investigating individual's attitudes. Moreover, the influences of Islam on innovation exist in reality outside the social participant. Thus, the reality in the current research is objective.

### 3.4.1.2. Epistemology:

In the same way that ontological questions examine philosophy concerning reality, questions about epistemology involve asking how researchers know about reality. When knowledge is studied, the relationship between the researcher and the facts to be examined should be clarified, and critically the evidence supporting that knowledge must be defined (Guba and Lincoln, 1994). Thus, the epistemology of a study demonstrates the assumptions of the researcher about the best way of questioning the nature of the world (Easterby-Smith *et al.,* 2012). Again, the positivism method of research understands the phenomenon as discrete knowledge which can be observed and measured (Collis and Hussey, 20013). In a similar way to natural scientists, the researcher is able to sustain the philosophy that examines the subject in an objective and independent way (Lewis *et al.,* 2007). According to this viewpoint, objects have a clear meaning that is separate from the awareness and principles of the researcher (Crotty, 1998). Thus, knowledge is either true or false; for positivists it is precise, fixed and can be proven by scientific methods and characterized by numbers and statistics. Moreover, as the data or evidence already exists, the investigator must collect and organize it. It is important, however, that the researcher's own values and perceptions do not misrepresent the evidence (Collis and Hussey, 2003). This allows quantitative research to be used as it is well suited to the positivist paradigm; the information is presented in a concrete, measurable system.

Collis and Hussey (2013) believe that the positivism paradigm approach should be taken to the study of human behaviour in the same way as research in the natural sciences.

The present research is intended to examine individual behaviour in the framework of religion and the economy; more precisely, the impact of religiosity on innovation propensity among Muslim believers. Therefore, the positivist philosophy seems suitable for directing this research. Survey research may be utilized to test theories by the analysis of empirical data and various conclusions produced. Primarily, positivist research involves the use of quantitative data (Bhattacherjee, 2012).

#### 3.4.1.3. Axiology:

It is necessary to be aware of issues surrounding axiological assumptions. This involves the investigation of the values and objects that are perceived as valuable in the context of the study. Positivist researchers are separate from the subject under investigation and examine the connections between the issues being discussed; therefore, they argue that their studies are value-free (Easterby-Smith *et al.,* 2012). Thus, the present research has the philosophical position based on three central assumptions; the ontological position is objectivism, the epistemological position is positivism and the axiological is value-free considering the researcher is separated from the issues studied.

### 3.4.2. Research approach:

Research design is "the plan and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis" (Creswell, 2009, p.3). These actions involve several decisions, guided by the assumptions the researcher has outlined about the phenomenon that is being studied, as described above. In addition, it is necessary to state the methods of data collection, analysis of this data and how the results of the survey will be explained and utilized (Creswell, 2009). Leading on from this process is the discussion of the approach of the study. It is necessary not only to be aware of the philosophy of the research but in addition, how the choice of questions to be studied is selected and stated. Taylor and Bogdan (1984) argued that all research approaches have their weaknesses and strengths. Furthermore, it has been argued that valuable and weak studies are carried out using both quantitative and qualitative methods (Flick, 2002). As a result, there is no single approach that suits all studies equally; choosing a suitable approach must be based on what the research is about and which questions it is

addressing. Both quantitative and qualitative methods are instruments and they involve various abilities. Moreover, different researchers with their own preferences might use analysis of qualitative data involving language or cultural observations or statistical analysis of quantitative data, depending on the most efficient way they decide to approach the study questions (Kvale, 1996). Thus, the quantitative and qualitative methods should be linked to the chosen epistemology and as Anderson and his Colleagues (2009) argue that positivist researchers often value quantitative data whilst interpretivists prefer utilising qualitative data. Alternatively, there is mixed-methods research, combining both quantitative and qualitative methods (Anderson *et al*., 2009).

Whether to follow a qualitative or quantitative approach in research is extensively discussed by the researchers. Despite divergence over the precise development of these two methodologies, consensus exists on the implications of each course and the practical consequences that result. Quantitative methods are thought more suitable for research that aims to allocate numerical values to observations or intends to produce a multifaceted statement (Brynard and Hanekom, 1997). In addition, quantitative research utilizes a number of methods where similar groupings are planned; thus, methods are formulated to represent respondents' varying experiences and points of view in a numerical method (Creswell, 1996). Researchers are able to validate a great range of variables in detail using quantitative methods, which means fewer differences in response will be permitted. In contrast, the qualitative approach, when data from sources including interviews, observations and documents is utilized to understand and articulate social phenomena, is considered more effective (Myers, 1997). Finally, mixed methods utilize both qualitative and quantitative data to produce jointly revealing insight (Bryman, 2006; Bryman and Bell, 2007). For example, a study of the experiences of workers in a human resources system, including their actions, could justify the application of both methods, quantitative and qualitative, to allow the research objectives to be satisfactorily investigated. Although Anderson (2009) favours mixed-methods research, this type of research has several disadvantages. For example, it is time-consuming and using multiple approaches can result in problems of lack of expertise and shortage of time. Thus, mixed methods may not be preferable for research which is restricted by time factors and the availability of both expertise and resources.

Therefore, choosing quantitative research is based on a number of justifications. First, this research follows the positivism paradigm, as (Bhattacherjee, 2012) stated that the positivism paradigm is mostly used for the quantitative method. Second, the current study uses an empirical research approach which uses a quantitative method. Finally, this research tries to quantify the relationship between Islamic religiosity and innovation propensity. Therefore, the present study uses quantitative data instead of qualitative data through a questionnaire since this method obtains the best match with the philosophy behind the study and the phenomena being investigated.

### 3.4.3. Research design:

In examining the two alternative approaches to data analysis, deductive and inductive research paradigms, it is necessary to be aware of the issues which have been debated by several authors (Cavaye, 1996, Tashakkori and Teddlie 1998, Eltaweel, 2011). As Hussey and Hussey (1997 p.19) clarified, deductive research is a study in which a conceptual and theoretical structure is developed which is then tested by empirical observation; thus, particular instances are deducted from general influences. According to Bryman and Bell (2015), the deductive theory is a popular understanding of the type of relationship between theory and research, which illustrates the methods of deduction. These involve a process that moves from examining general information which is refined to produce more specific facts. This is known as a top-down procedure. Alternatively, as Hussey and Hussey (1997) observed, inductive research develops new theory by observing empirical reality, creating general inferences from particular phenomena and moves from individual circumstances to accounts of general patterns or laws. This is clearly the opposite of the deductive method; thus, it is often referred to as a bottom-up approach. See table (2.2) for a comparison of the two approaches.

Table (3.2): Comparison of deductive and inductive approaches

| Deductive approach | Inductive approach |
|---|---|
| Tests theory utilizing deduction. | Utilizes inductive methods to develop theory. |
| Explains a phenomenon by analysis of a causal relationship following certain laws. | Describes obtained data concerning subjective meaning systems and explains behaviour by understanding it. |

| | |
|---|---|
| Collects quantitative data. | Collects qualitative data. |
| Uses several controls, both physical and statistical to rigorously test hypotheses. | Frequently researches everyday settings, aiming to minimize disruption created by the research to its participants. |
| Highly structured approach to research. | Minimum amount of structure in research approach. |

(source: Soiferman, 2010)

Following on from these statements, clearly, the present research will use quantitative and objective methods to obtain the data which will be analyzed using a deductive approach to investigate the relationships between the religiosity of Islam and innovation propensity. Having developed an institutional theory, resulting in a testable hypothesis, which is that the religiosity of Islam has a positive effect on attitudes toward innovation, this will be examined using empirical observations to confirm its validity.

### 3.4.4. Data collection method:

#### 3.4.4.1. Survey:

It is necessary to state how the principle data of the research was gathered; according to the suggestions of King and Horrocks (2010). The primary data of a study could be obtained utilising semi-structured survey methods which are created either by standardised questionnaires or interviews to amass data about individuals and their preferences behaviours and ideas in a systematic way. Surveys can be split into two chief categories: questionnaires, either postal, group-administered or online, and interviews such as individual, telephone, fax or group interviews (Fowler *et al.,* 2002; Mingers, 2001; 2003).

The survey research has some important strengths in comparison to other methods. Initially, it allows access to a massive range of facts about respondents as well as some data which cannot be directly observed, including people's preferences, conduct, beliefs and self-reported behaviour. Explanatory research accurately describes an event or problem and highlights the causal relationships (Anderson, 2009). Secondly, data can be gathered remotely which is necessary when a population is greater than it is possible to observe directly; thus an entire country could be studied if relevant sampling methods are employed to ensure that different parts of the population are properly represented. Thirdly, survey research is inexpensive and might require less time and be more efficient in comparison

with alternative methods, including experimental research and individual case studies. However, it must be noted that some biases are possible, including sampling bias and non-response bias (Bhattacherjee, 2012). By examining various situations, events, beliefs and opinions in a given population, in order to test a theory, survey research establishes causal relationships (Pinsonneault and Kraemer, 1993). Bhattacherjee (2012) argues that the questionnaire is a more suitable method than interviews when data is gathered from a large number of respondents at a modest cost and in a limited time span. Thus, the present research targeted the collection of data by questionnaire from 1000 participants who are Muslim individuals living in Saudi Arabia. The questionnaire was pre-tested (pilot) with 20 Muslim individuals in Saudi Arabia to gain feedback on the clarity of the questions and the general feasibility of the study. For this study, the data was collected over a two-month period during March and April 2019 using email ids acquired from SAASI.

#### 3.4.4.2. Sample and sampling techniques:

A research population can be defined as being a complete group of individuals, occurrences or items of interest that a study intends to investigate (Sekaran and Bougie, 2016). It is, however, problematic to obtain data from the entire target population due to issues such as time and cost constraints which would make the study unfeasible. Bhattacherjee (2012) asserts that a properly chosen data subset can be understood to correctly epitomize the complete population. Therefore, a method of sampling to choose a sample that characterizes the population of the research has been utilized in this study.

Several sampling stages must be undertaken. Firstly, the target population must be defined, and then, secondly, a sampling frame should be selected and finally, choosing a sample using well-known sampling techniques (Bhattacherjee, 2012). Given that this study is investigating the influences of Islamic religiosity on innovation propensity in Muslim societies, the target population will focus on the Muslim population of Saudi Arabia. The unit of analysis is individual Muslims. The sample frame of this study includes a computerized list, contains email IDs of 15000 Saudi Muslims which was obtained from the Saudi Arabia Authority of Statistic and Information (SAASI). According to Patton (2002), quantitative research relies on probability sampling and defines probability sampling as a technique in which every unit in the population has a chance (non-zero probability) of being

selected in the sample, and this chance can be accurately determined. Probability sampling suit to this research because the present study explores Muslims in general and it is necessary to give all members of society equal opportunities in the representation of the sample. Thus, the sampling techniques will be held using two probability sampling stages. The first stage was performed using stratified sampling, where the sampling frame is divided into standardized subsections that cover Saudi Muslim males (7635) and females (7365). The second stage was systematic sampling which, in this technique, the sampling frame is arranged according to some principles and factors are chosen at certain intervals using the formula element = N/*n* where *k* is the interval, N the sample frame and *n* is the sample size (Bhattacherjee, 2012). Thus, the interval *k* = N/*n* that is k =15000/1000 that equals 15. The reason behind selecting random sampling is because sample statistics of this technique are unbiased approximations of population parameters without weighting (Bhattacherjee, 2012). It is of importance that a decision is taken about the size of the sample and for quantitative research. The size can range from 300 to be comfortably valid, 500 to obtain good validity and 1000 for excellent validity (Tabachnick *et al.,* 2001). Therefore, this research selected a sample of 500 Muslim males and 500 Muslim females.

### 3.4.5. Justification of site choice:

An investigation of the existing literature suggests that little empirical economic research has taken place in Muslim countries (Tracey, 2012, Alturki and Braswell, 2010; Gallant *et al.,* 2010) and merely a few exploratory studies have studied the situation in Saudi Arabia. Consequently, this research was carried out in the Kingdom of Saudi Arabia due to a number of reasons. Firstly, Saudi Arabia is closely linked with the religion of Islam and it has a specific religious position in the Islamic world, being the area where Islam was originally revealed and the location of two of the holiest sites at Mecca and Medina. Secondly, the legal system, government and constitution of the Kingdom of Saudi Arabia are based on the foundation of Islamic principles. The first Article of the constitution of Saudi Arabia declares: "The Kingdom of Saudi Arabia is a sovereign Arab Islamic state with Islam as its religion; God's Book [the Holy Quran] and the Sunnah of His Prophet, God's prayers and peace be upon him, are its constitution, Arabic is its language and Riyadh is its capital". Similarly, in Article 7, it states that "Government in Saudi Arabia derives power from the Holy Quran and

the Prophet's tradition" (Royal Decree NO A/90, 27th Sha'ban 1412 AH [1 March 1992]). It is generally recognized that Saudi Arabia is an extremely traditional and sacred country where a majority of the population, or 90 percent, are Arab and nearly 100 percent are Muslims (Agency, 2013). Therefore, Saudi Arabia is suitable as a place to study the influence of Islam on innovation propensity. Furthermore, as the researcher is both a citizen of Saudi Arabia and has worked with business communities and government organizations, this helps to obtain satisfactory answers from respondents (Creswell, 2013).

### 3.4.6. Variables:

This study developed suitable survey methods by means of selecting relevant issues from the literature to examine the levels of Muslim religiosity, which is the independent variable and the probability to react positively to attitudes towards innovation, which is the dependent variable in the context of Saudi Arabia. Feldman (2004, p.4) suggests that the best order of the study variables is to discuss the independent variables followed by the dependent variables. Following Feldman's advice, the section below discusses the study variables.

#### 3.4.6.1. Measures of Islamic Religiosity (IR), the independent variable:

Although the principal measurements of religion that have been described in the literature (Hill and Hood, 1999) are helpful methods of measuring religious psychology, they have largely been developed to study mainly the beliefs of Christian adherents and those of other non-Muslim faiths. McFarland (1984) argues that scales that are created to study Christianity are not suitable for research into the psychological features of Muslim beliefs and practices. In this study, it is important to define exactly what Islamic religiosity means. Islamic religiosity is considered to be a multi-dimensional concept which can be described as a combination of factors (Alsanie, 1989; Galbraith *et al.,* 2007). The first dimension is composed of Islamic beliefs which include the belief in Allah, in the prophet Mohammad, in Allah's Angels, in the Books, the Messengers, the Day of Judgment, the Afterlife and Predestination are the elements of the six pillars of Islam. The second dimension is Islamic conduct that concerns the actions and behaviours of Muslim individuals in their daily lives, for example, prayer, charity, fasting and lastly, the pilgrimage to Mecca. In addition, it is

essential that Muslims should follow Islamic principles and abstain from all forbidden acts and conduct. Moreover, Khraim (2010) stated that frequently the accessible methods of measuring Muslim religiosity are translated from the initial English versions without any amendments by non-Muslim western academics. It is necessary to use more suitable methods to determine issues affecting Muslims living in the Muslim society (Zelekha *et al.,*2014). Therefore, the Islamic religiosity measurement in this study is mainly based on a scale of religiosity including factors that measure Muslims' beliefs and behaviours (Alsanie, 1989).

To measure the dimensions of Islamic religiosity, this study used the mean score of their aggregate answers of individuals of the normative, cognitive and regulative questions. Respondents were asked to specify their religiosity beliefs and behaviors in 30 questions using five-point Likert scale. The categories were: 1 = 'Strongly disagree' or 'Never'; 2 = 'Disagree' or 'Rarely'; 3 = 'Not sure' or 'Sometimes'; 4 = 'Agree' or 'Very often' and 5 = 'Strongly agree' or 'Always'. This results in a scale that has a range of scores from 30 to 150 and a higher score signifies more Islamic religiosity. First, the normative element of religion concerns the level individuals give value to religion (Assouad and Parboteeah,2018). Myers (2000) stated that the more individuals value religions, the more likely they are to practice religion. Therefore, this study combined the individual responses for the normative component reflecting religious practices and values. For example, the normative dimension is measured with (16) items representing the mean score of the total of individuals stating that they pray, fast Ramadan and give alms. For example, I make the obligatory prayers, I declaim the Holy Qur'an, I complete the necessary fasting (Ramadan), I accomplish the supererogatory fasting, I say further things that are not true, I give away the supererogatory charity, I promote virtue and prevent vice, I obey my parents, I try to smile as much as possible, I pay visits to relatives, I care about neighbours, I fulfil my promises, I follow the Islamic code of dress, I do not abuse others, I help old people when they need it, I perform Umrah. Secondly, in this study, the cognitive dimension is measured using ten different questions which represent the score of an individual's religious beliefs (Parboteean *et al*., 2015). In the cognitive dimension, respondents answered questions about the degree to which they believe in Allah, in hell, heaven and the afterlife,.For example, I believe there is no God but Allah, I believe Mohammed (pbuh) God's messenger, I believe in God's angels, I

believe in God's books, I believe in God's messengers, I believe in afterlife, I believe in predestination, I believe in hell, I believe in heaven. Finally, regarding the regulative dimension, Audretsch *et al*., (2013, p777) confirm that Islam adds new elements to the regulatory dimensions of society, which are derived directly from the Holy Quran. In this section, respondents were asked to respond the statements such as; I obey Sharia rules in every situation. For more details, see appendix (1).

A principal component factor analysis was utilised to investigate the relationship among the responses and determine if there is a correlation between the structure of Islamic religiosity determinants. Kline, (2014, p.3) defines factor analysis as "Factor analysis consists of a number of statistical techniques the aim of which is to simplify complex sets of data. In the social sciences factor analysis is usually applied to correlations between variables". According to Kaizer rule of thumb, the number of the remaining factors is that the factors eigenvalues are greater than one (Kaizer, 1960). Therefore, the factor analysis for this study revealed the presence of three factors (see Table 2.4). This result confirms the division that used for the three diminutions of Islamic religiosity. Factor 1 showed the cognitive dimension, factor 2 the normative dimension, and factor 3 the regulative dimension. Orthogonal rotation (Varimax) with Kaizer normalization resulted in the factor loadings reported in Table (2.5). Factor loading can be defined as the correlations between variables and factors (Kline, 2014). When deciding the factor loadings for the variables to the explanatory factors Kline (1994), suggests that a factor loading above 0.6 is high, a factor loading above 0.3 is moderately high and factor loadings under 0.3 can be ignored. Thus, in each of the three factors identified in the factor analysis all factor loadings exceed 0.3. Please see Table (2.5) for more details.

### 3.4.6.2. Measures of Innovation (IN), the dependent variable:

In deciding which innovation measurement to use, it is necessary to categories the scale items which could be concentrated around the issues of innovation. The scale items (16) capture the respondents' attitudes towards new ideas, change and risk-taking (Bénabou *et al.,* 2015). The innovation questions were obtained from three sources, namely, World Value Survey (2005), Scott (1994) and Gatignon *et al.,* (2015). The first category is attitudes towards new ideas focusing on general novelty and Creativity. For example, decide which is

better: ideas that have endured for a long time or new ideas? Or It is important to do things one's own way. The second category concerns attitude towards change. Questions were asked such as: I am worried about the problems that might be caused by change against I welcome the potential that something new is being created. Finally, as Rose-Ackerman (1980) confirms that risk-taking is essential to innovation, a risk-taking attitude is measured by a question such as: I believe that adventure and taking risks important to this person to have an exciting life. In analysing and interpreting the innovation data, respondents were asked 16 questions using five-point Likert scale. The categories were: 1 = 'Strongly disagree' or 'Never'; 2 = 'Disagree' or 'Rarely'; 3 = 'Not sure' or 'Sometimes'; 4 = 'Agree' or 'Very often' and 5 = 'Strongly agree' or 'Always'. This results in a scale which has a range of scores from 16 to 80 and a higher score signifies more attitudes to innovation. For more details see the appendix (1).

In this research, a number of socio-demographic variables were controlled as these may influence Muslims' attitudes towards innovation. The relevant empirical literature suggests that age, gender, education, work experience and creativity may all affect innovation attitudes (Miller, 2004, Ferguson *et al.,* 2014, Bénabou *et al.,* 2015). Consequently, the data analysis controls for gender and entrepreneur using binary variables (0/1 values). The binary variable takes a value of 1 for respondents who indicated on the questionnaire that they were entrepreneurs and women while a value of 0 for non-entrepreneurs and men. Age and work experience were measured by continuous variable by years and education was measured as well by continuous variable using ascending coding which 1 represents no education and 7 represents postgraduate degree.

### 3.4.7. Reliability and Validity:

Reliability can be defined as the amount to which the measurement of a concept is consistent or dependable (Bhattacherjee, 2012). In other words, if the scale is used to measure the same concept many times, the findings should be similar every time unless the phenomenon itself is changing. Cronbach's alpha reliability coefficient was used to test the reliability of the scale; with a value of between 0.50 and 0.70 showing moderate reliability, whereas a value of more than 0.70 is considered to indicate high reliability (Hinton *et al.,* 2014). Thus, in the current research, the total scale was shown to have a strong internal

consistency with a Cronbach's alpha value of 0.80 for the independent variables, Islamic religiosity 0.79, normative dimension 0.86, cognitive dimension, 0.69 regulative dimension and 0.76 for the dependent variable, innovation.

Validity is an important element of the study process. Pilot testing as a validity technique aids the identification of potential problems in the study design or procedures. In addition, it safeguards the consistency of the instruments of measurement utilized to ensure that they measure the concepts under examination effectively (Miles and Huberman, 1994; Saunders *et al.,* 2003). Therefore, before the full questionnaire is distributed, an initial questionnaire was pre-tested (pilot) with 20 Muslim individuals in Saudi Arabia to gain feedback on the clarity of the questions and the general feasibility of the study.

In conclusion, the previous section described the philosophy underlying the study, which is objective and positivist, and the appropriate methodology to answer the research questions. The data collection methods were examined and the decision was made to collect quantitative data using a questionnaire to create the primary data. The strategies used included the deductive approach with probability sampling. The relevant variables were selected, the independent variables being religiosity and the dependent variables regarding innovation propensity, also utilising control variables. The reliability and the validity of the research were addressed.

## 3.5. Results:

### 3.5.1. Descriptive statistics:

Table (3.3) lists the answers to socio-demographic questions, dependent and independent variables of 640 participants to the questionnaire survey. It demonstrates that 50.16 % of the participants were men, whereas 49.84 % were women. As regards the age range of the sample, participants varied between 15 and 75 years of age, having a mean age of 35.01 and 14.38 years was the standard deviation. As regards the level of education, this was coded from 1 to 7, where 1 represents a participant with no education while 7 represents a postgraduate degree. The majority (66.56 %) of the participants had achieved bachelor's or postgraduate qualifications, whereas 33.44 % had gained an intermediate, secondary, primary or no qualification. The work experience range of the sample participants varied in years from 1 to 40 and the mean was 11.67 years with 11.60 being the standard deviation. It shows that almost (20.78%) of the respondents were entrepreneurs, while 79.22% were non-entrepreneurs

Table (3.3) illustrates the distribution of participants' creativity propensity. The respondents' creativity mean is 4.58 and a standard deviation of 0.78 Table (2.3) demonstrates the distribution of participants' innovation propensity as a dependent variable, across the sample. As mentioned above, the innovation measurement scale has a five-point Likert scale ranges of scores from 1 to 5 for each question (16 questions), and a higher score signifies more propensity to innovation. The sample's innovation distribution of participants varied between 16 and 80. The respondents' innovation mean is 3.60 and a standard deviation of 0.49. This demonstrates that most Muslims in this study were found to prefer innovation.

The results for independent variables are set out in Table (3.3), as regards Islamic religiosity, the Islamic normative dimension, the Islamic cognitive dimension, and the Islamic regulative dimension are enumerated on the Likert scale. As mentioned above, religiosity was measured by 30 questionnaire items. The Islamic religiosity distribution of the participants varied between 30 and 150. 4.51 is the mean score of Islamic religiosity and there is 0.29 standard deviation. On the normative dimension, the mean score of the

respondents was 4.16 with a slandered deviation of 0.45. On the cognitive dimension, the mean score of the respondents is 4.94 with a slandered deviation of 0.24 and 4.82 with a slandered deviation of 0.43 for the regulative dimension.

When analysing the principal component factor analysis matrix in Table (3.5), it can be seen that in factor 1 there are loadings that are higher than the other factors. The two higher loadings of factor 1 “Construct 1 Cognitive Dimension” are above 0.8269 and Construct 2 “Normative Dimension” are loaded with higher loadings of 0.6333 while Construct 3 the Regulative Dimension are loaded with higher loadings of 0.6719.

### 3.5.2. Empirical analysis:

To test the research hypotheses, we carried out a hierarchical regression analysis including six models to illustrate the connections between innovation propensity and the three dimensions of Islamic religiosity. In the initial model, the impact of innovation was shown by controlling for several variables that were thought to potentially affect the probability of innovation. In the second model, the independent variable of Islamic religiosity was added to the equation utilizing Ordinary Least Squares regression. This model examines the effect of Islamic religiosity, as Islamic religiosity is one construct on Muslims’ innovation propensity.

For the third model, similarly, we tested the effect of the first dimension of Islamic religiosity, ***normative***, on Muslims' propensity to innovation using ordinary least squares (OLS) regression. Thus, to examine the first hypothesis that Islamic individuals’ innovation propensity has a positive connection with their ***normative dimension*** of Muslim religiosity, we propose the following regression formula:

***Innovation = ƒ (Normative dimension of Islamic Religiosity + Controls) + ε.***

***Y(Innovation) = β1χ(Normative dimension) + β2(Female) + β3(Age) + β4(Education) + β5(Work experience) + β6(Entrepreneurs) + β7(Creativity) + ε.***

For the fourth model, the effect of the second dimension of Islamic religiosity, ***regulative***, on Muslims' propensity to innovation was tested using OLS regression. To examine the second hypothesis, this regression formula is proposed:

***Innovation = ƒ (Regulative dimension of Islamic Religiosity + Controls) + ε.***

***Y(Innovation) = β1χ(Regulative dimension) + β2(Female) + β3(Age) + β4(Education) + β5(Work experience) + β6(Entrepreneurs) + β7(Creativity) + ε.***

For the fifth model, OLS regression was utilized to examine the effect of the ***cognitive*** dimension of Islam on Muslims' propensity to innovation. To test the third hypothesis we propose the following regression formula:

***Innovation = ƒ (Cognitive dimension of Islamic Religiosity + Controls) + ε.***

***Y(Innovation) = β1χ(Cognitive dimension) + β2(Female) + β3(Age) + β4(Education) + β5(Work experience) + β6(Entrepreneurs) + β7(Creativity) + ε.***

For the sixth model, OLS regression was utilized to examine the effect of the three dimensions of Islam normative, cognitive and regulative on Muslims' propensity to innovation and we propose the following regression formula:

***Innovation = ƒ (Normative dimension of Islamic Religiosity + Regulative dimension of Islamic Religiosity + Cognitive dimension of Islamic Religiosity + Controls) + ε.***

***Y(Innovation) = β1χ(Normative dimension) + β2χ(Regulative dimension) + β3χ(Cognitive dimension) + β4(Female) + β5(Age) + β6(Education) + β7(Work experience) + β8(Entrepreneurs) + β9(Creativity) + ε.***

The initial model shows that the impact of innovation propensity is affected by several control variables that probably impact innovation, namely age of individual, their gender, their educational achievement, their job experience, their entrepreneurial status and their creativity. The findings, shown in table (3.6), illustrate that women showed a non-significant lower amount of innovation compared to the men. Among the control variables, age has a significant negative impact on demonstrating a propensity for innovation $p<0.01$, while work experience, entrepreneurial status and creativity show a positive significant effect on the innovation propensity with *p*-value $p<0.01$. Although the previous literature confirms that education is a main element for effecting innovation, it appears on the regression that education has no effect on innovation propensity.

In model two, the independent variable of Islam was entered as one construct in the regression equation. The findings of regression show a positive significant relationship between innovation propensity and Islamic religiosity with a *p*-value of <0.01. The control variables agreed with the initial model with the exception of gender. Being female has a significant negative effect showing a p-value of <0.1. In the third model, we use the normative dimension of Islam in the equation of regression. The findings of the regression demonstrate a positive significant relationship between innovation propensity and the normative dimension of Islamic religiosity showing a *p*-value of <0.01. The control variables were generally consistent with the second model.

Similarly, model four indicates a significant positive relationship ($p$ <0.1) between innovation and the regulative dimension of Islam. There were no differences among the control variables between this model and the previous one, model three. In the fifth model, the relationship remains significantly positive between innovation propensity and Islam throughout the cognitive dimension with ($p$ <0.1). There were no differences among the control variables between this model and the previous one with the exception of gender. Female has no significant effect on this relationship. Finally, in model six, we use the three dimensions combined of Islam into the equation of regression. The findings of the regression demonstrate only the normative dimension has a positive significant relationship with innovation propensity with a *p*-value of <0.01. There were no differences among the control variables between this model and model four. As had been hypothesised, there was strong indication suggests a positive relationship between innovation propensity and the three dimensions of Islamic religiosity, viz normative, regulative and cognitive dimensions. Table (3.6) illustrates the findings of the six models in more detail.

## 3.6. Discussion:

The results of this study show that there is a strong connection between Islam and innovation propensity which is consistent with the previous literature, such as the observations on religion and innovation made by Assouad and Parboteeah (2018). Assouad and Parboteeah argue that there is a positive association between religion and innovation. In particular, the three elements of Christianity, normative, cognitive and regulative, have a significant impact on adherents' innovation propensity. The research findings demonstrate that Islamic traditions support innovation propensity and Muslims who acquire more religiosity are likely to be innovative. However, the study findings disagree with some previous literature that has suggested that religion is inflexible and discourages innovation (Benabou *et al.,* 2015) and that Islam restrain new ideas (Brushaber, 1991).

This study indicates that the relationship between the three institutional dimensions of Islam has a significant relationship with innovation propensity. First, the normative dimension of Islamic religiosity is positively correlated with innovation propensity. Muslims who pray, recite the Holy Quran and take part in fasting and other religious activities have a considerable level of innovation. The positive impact of Islam is consistent with the previous literature. Values and norms obtained from the Holy Quran and Hadeeth encourage Muslims to be innovative. The prophet Mohammed (pbuh) said: the person who tries to make a permissive innovation in Islam is rewarded as well as person's followers until the Day of Judgment (Al-karasneh and Saleh, 2010). This Hadeeth is a basis for demonstrating the importance of permissive innovation in Islam. Second, the research demonstrates the positive connection between the cognitive element of Islam and innovation propensity. The findings show that Muslims with a high level of religious belief such as belief in Allah, belief in the future, the prophets, angels, life after death, heaven and hell have considerable innovation propensity, which with the existing literature (Ahmed and Abdalla, 1999). In Islam, the strong belief in the future, which is an important Islamic perspective, promotes innovative ideas. God Almighty says in Surh Yunus verse 14: ***"Then We made you follow after them, generations after generations in the land, that We might see how you would work!"*** (Al- Hilali and Khan, 1996). This verse demonstrates that God almighty encourages Muslims to believe and think about the future and be open to new innovations.

Furthermore, innovators frequently require faith in supernatural ideas throughout the process of successful innovation (Walter *et al.,* 2011). Al-Habeeb (2003) and Iannaccone (2006) argue that Islamic traditions support belief in the supernatural such as belief in heaven and hell. Consistent with this mainstream literature, the study results show that Muslims with considerable religiosity have a robust belief in the supernatural. Finally, the research demonstrates the positive connection between the regulative element of Islam and innovation propensity. This was evidenced by the principle of ijtihad, which was created by the Sharia and encouraged it in the hadiths of the prophet; as an example, the prophet Muhammad said ,"Allah will raise for this community at the end of every hundred years the one who will renovate its religion for it" (El Fiky, 2019.p8).

The findings show that Muslims who have a high level of commitment to Islamic law have a high level of innovation propensity. The findings reveal that Muslims who follow Islamic law are more likely to take risks resulting in innovation. This is consistent with existing literature. For example, Metwally (1997) states that Islamic law encourages the sharing of risk and profit as part of the financial process of interest-free banking in Islamic countries. Clearly, risk-taking is essential to innovative activity (Rose-Ackerman, 1980). Modern interest-free banking has been an important innovation in Islamic countries with many benefits (Mayer, 1985). However, table (2.4) showed an unexpected result; it demonstrated that there is no substantial connection between education and innovation, and likewise, education does not affect the relationship between Islam and innovation, which is contrary to previous literature. For example, Mumford and Gustafson (1988, p.38) suggested that educational acquirement is important for innovation and said: "educational system that supports autonomy or builds self-esteem might increase the likelihood of innovative achievement". Equally, there is a considerable connection between education and innovation (Turpin *et al.,* 2009). Islamic teachings encourage Muslims to gain all kinds of knowledge through education that might assist people to improve their life.

This study makes a number of contributions to the existing knowledge. Firstly, the results of this study are distinct results from existing studies that have studied the connection between innovation propensity and religion. The present study demonstrates that Islam supports innovation propensity through Qur'anic verses, prophetic Hadiths (religious texts) and Ijtehad, which were not mentioned at all in previous studies. Previous

studies indicate that religion supports innovation propensity through education, religious networks, work ethics; however, none of them mentioned the positive effect of religion on innovation propensity through religious texts, which made this study unique. Secondly, using the lens of institutional theory (Scott, 1995, 2008), the study examines how Islamic religiosity gives rise to the institutional theory that effects Muslims' innovation propensity and this study considers the three dimensions of Islam while, however, previous studies considered only one dimension (e.g. Bénabou *et al.,* 2015). Thirdly, the current study adds to the extant literature on Islam and innovation propensity by exploring this relationship empirically.

Although the findings of this research are significant, there are some limitations that future studies can contribute to. This research is incapable of examining if innovation propensity causes people to be extra religious or less religious. Future research can address these compelling issues. The selection of participants in this research were gathered from the inhabitants of one Islamic country and that reduces the generality of the results ability of the result. Future research can extend the area of this study by involving more examples of other Islamic countries or by involving more world religions such as Christianity, Judaism and Confucianism. Whereas the current research has examined the connection between Islam and innovation propensity at the individual level, forthcoming studies could investigate at the macro level, therefore promoting the robustness of the present results.

The present research implies various implications, demonstrating that economic development takes place within a country's religious environment rather than separate from it. It has been shown that economic growth is influenced by the major construct of religion. Thus, it is necessary for the administration of Saudi Arabia to undertake further investigations on the connections between religion and economic growth to obtain a more profound comprehension of this relationship. In addition, a literature review in this research has found that education has a significant correlation with innovation. Therefore, institutes of education in Saudi Arabia should make available education in innovation for all levels of students from the early stages of education up to graduation. This implication would provide all Saudi students with the best mindset for innovation.

## 3.7. Conclusion:

Since the early twentieth century until the current time, the debate on the ways religion may affect the economy continues being developed (Mellahi and Budhwar, 2010). One important aspect of economy is innovation, which has recently received an academic attention due to the fact that innovation has an important role in promoting economic development (Du Plessis, 2007). Weber and Max (2013) assert that religion supports work ethic and creates a marketplace which allows people to exchange their ideas and experiences to develop innovation in their community. Although innovation is affected by several factors including religion, there are differences between the effect of various religions on innovation. Wang and Gan (2008) indicate that western religion supports innovation more than eastern religion. However, much of the existing literature examining the connection between innovation and religion is focused on Christianity and diverse Eastern religions and there is a lack of literature that investigates the effects of Islam. Thus, it is necessary to comprehend the impact of religion on innovation propensity from an Islamic perspective.

Following a recent study, Assouad and Parboteeah (2018) explained the relationship between religion and innovation; this study uses the lance of institutional theory, which has three dimensions normative, cognitive and regulative, to illustrate the relationship between Islamic religiosity and Muslims' innovation propensity. The normative dimension of Islam relates to religious activity, norms and values come from the Holy Quran and Sunah. Verses from the Holy Quran state that Allah created the world out of nothing which is one of Allah's innovations. Allah told the prophet Mohammad (pbuh) that mankind is the successor of Allah in this world and, therefore, Muslims should be innovative. The cognitive dimension of Islam is firstly related to religious beliefs such as belief in Allah, messengers, angels, and secondly to education. Previous research presented a number of Islamic scholars who create innovation in all aspects of life such as in education, medicine and science. Moreover, current studies have demonstrated that the Ministry of Education has created a program to develop innovation in universities. The regulative dimension of Islam is Sharia law which is a set of rules and laws that control individual behaviours. This study gives an example of innovation in the Islamic banking system such as interest-free Islamic banking, Murabaha

and the sharing of risk-taking. The three hypotheses of this research are that the normative, cognitive and regulative dimensions of Islam have positive effects on Muslims' innovation propensity. The results of the regression model demonstrate that Muslims in Saudi Arabia with considerable religiosity in normative, cognitive and regulative dimensions of Islam are more likely to be innovators. This study examined individuals' Muslim behaviour empirically in Saudi Arabia, considered the most famous Islamic country. In conclusion, innovation is an economic phenomenon that is certainly not isolated from social and psychological factors such as gender.

A number of academic studies, Ostergaard *et al*., (2011), Wood (1987), have demonstrated that gender has positive links with innovation and the amount of research on this theme has almost doubled every five years (Harrison and Klein, 2007). In addition, recently, the connections between gender and innovation have been increasingly researched by a number of different disciplines (Crowden, 2003; Kingiri, 2010; Danilda and Thorslund, 2011 Johansson and Lindberg, 2011). Therefore, it is important to study how gender might affect the relationship between Islam and innovation propensity; thus, the second paper will investigate this relationship.

**Table (3.3): Socio-demographic, dependent and independent variables.**

| Variable | (N) | (*P*) | (*M*) | (*SD*) |
|---|---|---|---|---|
| **Control variables:** | | | | |
| Gender: | 640 | 100 | | |
| Female | 319 | 49.84 | | |
| Male | 321 | 50.16 | | |
| Age* | 640 | 100 | 35.01 | 14.38 |
| Education | 640 | 100 | 5.62 | 1.07 |
| Experience* | 640 | 100 | 11.67 | 11.60 |
| Entrepreneurial status | 640 | 100 | | |
| Entrepreneurs | 133 | 20.78 | | |
| Non-Entrepreneurs | 507 | 79.22 | | |
| Creativity | 640 | 100 | 4.58 | 0.78 |
| **Dependent variable:** | | | | |
| Innovation propensity | 640 | 100 | 3.60 | 0.49 |
| **Independent variable:** | | | | |
| Islamic religiosity | 640 | 100 | 4.51 | 0.29 |
| Normative dimension | 640 | 100 | 4.16 | 0.45 |
| Cognitive dimension | 640 | 100 | 4.94 | 0.24 |
| Regulative dimension | 640 | 100 | 4.82 | 0.43 |

**(N):** Observations, **(*P*):** Percent, **(*M*):** Mean, **(*SD*):** Stander Deviation
***** Years

**Table (3.4): The factors Eigenvalues.**

| Factor | Eigenvalue | Difference | Proportion | Cumulative |
|---|---|---|---|---|
| **Factor1** | **5.67138** | **2.72442** | **0.5627** | **0.5627** |
| **Factor2** | **2.94696** | **1.48725** | **0.2924** | **0.8552** |
| **Factor3** | **1.45971** | **0.61224** | **0.1448** | **1.0000** |
| Factor4 | 0.84747 | 0.44304 | 0.0841 | 1.0841 |
| Factor5 | 0.40443 | 0.02125 | 0.0401 | 1.1242 |
| Factor6 | 0.38319 | 0.04292 | 0.0380 | 1.1622 |
| Factor7 | 0.34026 | 0.09322 | 0.0338 | 1.1960 |
| Factor8 | 0.24704 | 0.00875 | 0.0245 | 1.2205 |
| Factor9 | 0.23829 | 0.07815 | 0.0236 | 1.2442 |
| Factor10 | 0.16014 | 0.01181 | 0.0159 | 1.2601 |
| Factor11 | 0.14833 | 0.02750 | 0.0147 | 1.2748 |
| Factor12 | 0.12083 | 0.04771 | 0.0120 | 1.2868 |
| Factor13 | 0.07312 | 0.06905 | 0.0073 | 1.2940 |
| Factor14 | 0.00407 | 0.00681 | 0.0004 | 1.2944 |
| Factor15 | -0.00274 | 0.04145 | -0.0003 | 1.2941 |
| Factor16 | -0.04419 | 0.00662 | -0.0044 | 1.2898 |
| Factor17 | -0.05081 | 0.03475 | -0.0050 | 1.2847 |
| Factor18 | -0.08556 | 0.00875 | -0.0085 | 1.2762 |
| Factor19 | -0.09431 | 0.00951 | -0.0094 | 1.2669 |
| Factor20 | -0.10383 | 0.02887 | -0.0103 | 1.2566 |
| Factor21 | -0.13270 | 0.03885 | -0.0132 | 1.2434 |
| Factor22 | -0.17155 | 0.03291 | -0.0170 | 1.2264 |
| Factor23 | -0.20446 | 0.00408 | -0.0203 | 1.2061 |
| Factor24 | -0.20854 | 0.01969 | -0.0207 | 1.1854 |
| Factor25 | -0.22823 | 0.04776 | -0.0226 | 1.1628 |
| Factor26 | -0.27599 | 0.02228 | -0.0274 | 1.1354 |
| Factor27 | -0.29827 | 0.03645 | -0.0296 | 1.1058 |
| Factor28 | -0.33472 | 0.02363 | -0.0332 | 1.0726 |
| Factor29 | -0.35835 | 0.01460 | -0.0356 | 1.0370 |
| Factor30 | -0.37295 | . | -0.0370 | 1.0000 |

**Table (3.5): Factor analysis.**

| Variable | Construct 1<br>Cognitive Dimension | Construct 2<br>Normative Dimension | Construct 3<br>Regulative Dimension | Uniqueness |
|---|---|---|---|---|
| IR1 | | 0.3360 | | 0.7881 |
| IR2 | | 0.4982 | | 0.7421 |
| IR3 | 0.3781 | | | 0.8281 |
| IR4 | | 0.4305 | | 0.7983 |
| IR5 | | | 0.3127 | 0.8574 |
| IR6 | | 0.4328 | | 0.8046 |
| IR7 | | 0.4699 | | 0.7709 |
| IR8 | | 0.5404 | | 0.6745 |
| IR9 | | 0.5228 | | 0.7143 |
| IR10 | | 0.5386 | | 0.7093 |
| IR11 | | 0.6333 | | 0.5927 |
| IR12 | | 0.4856 | | 0.7457 |
| IR13 | | 0.4808 | | 0.7473 |
| IR14 | | 0.3222 | | 0.8696 |
| IR15 | | 0.4535 | | 0.7625 |
| IR16 | | 0.3909 | | 0.8303 |
| IR17 | | | 0.5764 | 0.6674 |
| IR18 | | | 0.6719 | 0.5195 |
| IR19 | | | 0.3778 | 0.8349 |
| IR20 | | | 0.6207 | 0.5908 |
| IR21 | 0.4562 | | | 0.7380 |
| IR22 | 0.4631 | | | 0.7833 |
| IR23 | 0.8467 | | | 0.2790 |
| IR24 | 0.9258 | | | 0.1339 |
| IR25 | 0.6145 | | | 0.6163 |
| IR26 | 0.8269 | | | 0.3056 |
| IR27 | 0.7917 | | | 0.3483 |
| IR28 | 0.4276 | | | 0.7656 |
| IR29 | 0.5572 | | | 0.6880 |
| IR30 | 0.7627 | | | 0.4156 |
| Cronbach's alpha | 0.8656 | 0.7911 | 0.6954 | - |

* IR represents Islamic Religiosity questions

**Table (3.6): The relationship between Innovation and Islamic religiosity dimensions (Normative, Cognitive and Regulative dimensions).**

| Variables | Model (1) | Model (2) | Model (3) | Model (4) | Model (5) | Model (6) |
|---|---|---|---|---|---|---|
| **Total Islamic religiosity** | | 0.566*** | | | | |
| | | (0.0614) | | | | |
| **Normative Dimension** | | | 0.395*** | | | 0.397*** |
| | | | (0.0390) | | | (0.0404) |
| **Regulative Dimension** | | | | 0.0697* | | 0.00839 |
| | | | | (0.0417) | | (0.0398) |
| **Cognitive Dimension** | | | | | 0.134* | -0.0276 |
| | | | | | (0.0753) | (0.0728) |
| **Female** | -0.0700 | -0.0765* | -0.0756* | -0.0761* | -0.0669 | -0.0770* |
| | (0.0454) | (0.0426) | (0.0421) | (0.0454) | (0.0453) | (0.0424) |
| **Age** | -0.0107*** | -0.0123*** | -0.0129*** | -0.0108*** | -0.0106*** | -0.0129*** |
| | (0.00269) | (0.00254) | (0.00251) | (0.00269) | (0.00269) | (0.00251) |
| **Education** | 0.0300 | 0.0238 | 0.0252 | 0.0291 | 0.0289 | 0.0253 |
| | (0.0183) | (0.0172) | (0.0170) | (0.0183) | (0.0182) | (0.0170) |
| **Experience** | 0.0126*** | 0.0117*** | 0.0116*** | 0.0125*** | 0.0125*** | 0.0116*** |
| | (0.00323) | (0.00304) | (0.00300) | (0.00323) | (0.00323) | (0.00301) |
| **Entrepreneurs** | 0.165*** | 0.139*** | 0.119*** | 0.167*** | 0.170*** | 0.117*** |
| | (0.0478) | (0.0450) | (0.0446) | (0.0477) | (0.0478) | (0.0448) |
| **Creativity** | 0.188*** | 0.153*** | 0.157*** | 0.184*** | 0.183*** | 0.157*** |
| | (0.0235) | (0.0224) | (0.0220) | (0.0236) | (0.0236) | (0.0222) |
| **Constant** | 2.803*** | 0.520* | 1.427*** | 2.496*** | 2.164*** | 1.514*** |
| | (0.159) | (0.289) | (0.200) | (0.242) | (0.392) | (0.386) |
| **Observations** | 640 | 640 | 640 | 640 | 640 | 640 |
| **R-squared** | 0.147 | 0.248 | 0.266 | 0.151 | 0.151 | 0.266 |

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

# Chapter 4 (Paper2):

## Gender and the relationship between Islamic religiosity and Innovation propensity

## Abstract

In our previous work, using the lens of institutional theory, this association was examined from an Islamic perspective. We found that Islamic religiosity has a positive impact on Muslim's innovation propensity on the three institution theory dimensions, normative, cognitive and regulative. The goal of this research is to expand this effort by examining how gender might influence this relationship. Using data collected from the Kingdom of Saudi Arabia, a sample of 640 Muslim men and women has been used to examine the study hypothesis. Ordinary least squares (OLS) regression statistical method has been used to predict the study relationship. The findings demonstrate that the positive impact of Islam on innovation propensity is significantly greater for men compared to women. Limitations and directions for future research will be discussed.

## 4.1. Introduction

Previous research in economy (Ayanian *et al*., 2015) and sociology (Miller, 2000) has investigated the connections between economic development and the beliefs and values of followers of several religions. These arguments were initially developed by Weber (1930, 2002) and supported by Parboteeah *et al.,* (2003). They emphasised that the protestant work ethic, including hard effort, commitment, honesty and patience, is really obeyed by several different religions. While innovation is increasingly considered to be an essential method of enhancing economic development and creating prosperous regions and nations (Wong *et al.,* 2005), limited economic studies have investigated the effect of religion on innovation propensity (Benabo, 2015).

Although the available literature suggests that religion benefits both genders with regard to innovation, some scholars have highlighted variations between male and female in their religiosity and differences in their attitudes toward innovation. For example, scholars suggested that women seem to acquire more religious beliefs than men (Stark, 2002; Roth and Kroll, 2007). The debate notes that the variation between genders in religiosity attributed to differences in socialisation between males and females (Collett and Lizardo, 2009) and their differing social position (Baker and Whitehead, 2016). On the other hand, previous research has confirmed that gender has a central part in the creation of innovation (Whittinton and Smith, 2005). This literature concludes that women are more averse to innovation than their counterparts both in social (Danilda and Thorslund, 2011) and economic (Eckel and Grossman, 2002) areas. The reasons behind the differences resulting in greater innovation by men compared to women include the imbalance between family duties and work (Still and Timms, 2000), limited networks of women compared to men (Renzulli *et al.,* 2000), low access to education (Ighomereho *et al.,* 2013), low access to financial recourses (Nwoye, 2011) and women are more risk-averse than men (Filippin and Crosetto, 2016).

Furthermore, a number of previous studies have highlighted additional challenges that are faced by Muslim women in particular with regards to innovation. One example of this argument is that Muslim women by Sharia have low financial responsibility comparing to Muslim men, as Tylecoat (1994) asserted that taking financial responsibility is a key

characteristic of innovation. Other challenges include the system of male guardianship by which the woman's father, brother, husband or son has the authority to make important decisions on her behalf. Guardianship reduces the levels of Muslim women's independency and freedom required for all basics of the creative and innovation process (Fenwick, 2003). A third challenge faces Muslim women is choosing the field of study in the education system. In some Muslim countries, Muslim women have limited choice in the type of subjects of study. Consequently, they might lose the opportunity of acquiring features that are required for innovation (Stevenson *et al.,* 2001) and limit several jobs that they are able to do (Cordsman, 2003). For example, teaching and clerical jobs are being an extension of their domestic roles rather than more participating in innovative activities. Boddy (1982) argues that the reasons for challenges faced by Muslim women are the religious prohibitions forbidding women to mix with men in all life environments (Boddy, 1982). However, while the literature has discussed this argument from different religions, it still needs to be asked how gender variations may affect the connections between Islam and innovation propensity.

Therefore, the main reason for studying this topic is to fulfill an apparent gap in the knowledge of the impact of gender on the connection between Islam and innovation propensity and provide a comprehensive understanding of this phenomenon utilising quantitative research methods. This study will explain and test the impact of gender on the relationship between Islamic religiosity and innovation propensity through the lens of institutional theory, including the normative, cognitive and regulatory aspects (Scott, 2008). The examination of this relationship raises questions including: (1) What effect does Islam have on the innovation propensity of Muslim women? (2) How does Islam influence the attitude of Muslim men towards innovation? (3) What is the variance between the attitudes of Muslim females and males on the relationship between Islam and innovation propensity?

The structure of this paper will be divided into seven sections. Section 1 introduces the second paper which includes a summary of the research and its aims and the questions to be examined, resulting in several objectives. Following on from section 1, section 2 discusses the available literature focusing on the literature gap where more information is required. In section 3, gender and the connection between Islam and innovation propensity is reviewed using the framework of institutional theory. Section 4 explains the reasoning

behind the methodology that is utilized in this study. This is followed by section 5 which will discuss the data analysis and the empirical findings showing the ways in which the study hypothesis was examined. Subsequently, in section 6, the research findings will be discussed and linked to the previous literature. Finally, section 7 presents the conclusions of the research and clarifies the main limitations of the study and the recommendations of future areas of study. The proceeding section critically discusses the existing literature on gender and the relationship between religion and innovation, and more specifically the influence of Islam on attitudes of Muslim women and men towards innovation.

## 4.2. Literature review

### 4.2.1. Religion and gender

A number of academic scholars acknowledge that socio-economic development is influenced by both gender and religion. Although a large amount of empirical studies exist on the subject of gender and religion, which are useful to examine and to inform economical analyses of this subject, the practical implementations of these factors often neglect to consider these important factors (Carroll, 1983). For example, there is an interesting body of work investigating the role of gender and Christianity in Africa and Asia (Robbins, 2004) and in the USA (Gerber, 2011) via theorises the processes of moral reasoning and looks through a critical lens at masculinity. An additional example, recent studies of Islam and gender in North Africa and the Middle East by authors such as Mahmood (2005), Deeb (2006), Schielke (2009, 2010), Hafez (2011), Ahmed (2011) and Schulz (2012) investigate how Islam can create new types of gendered agency. These contributions open new descriptions of the links between religion and gender in everyday life in the modern world (Avishai *et al.*, 2015).

Social scientists who study religion commonly accept that females are more religious than males (Voas *et al.,* 2013). Copious surveys, over more than one century, have frequently discovered the same phenomenon (Argyle and Beit-Hallahm, 1997; Walter and Davie, 1998; Roth and Kroll, 2007). Voas *et al*., (2013), for example, utilized European Social Survey data to study the differences between the religiosity of women and men. Voas and his colleague found that women are, to a great extent, willing to identify with a particular religion more frequently than men and consider themselves believers and take part in both communal and private religious activities. Similarly, Stark (2002) confirms that men being less religious than women can be seen as a generalisation that is true around the world as well as through history. Collet and Lizardo (2009) found a similar gap between genders concerning religiosity resulting in evidence that socialisation must have some effect on this differentiation. They propose that there are several possible reasons for women's religious beliefs being stronger and involving more overt religious practices than men.

The most widely accepted explanation for the gender gap is, first, provided by psychological theories which suggest that women are likely to have stronger psychological attributes including passiveness, submissiveness and obedience compared to men from the

same social group (De Vaus and McAllister, 1987). In addition, women are naturally more positive towards religion than men; they feel more guilt and find religion relieves their guilt (Gray, 1971; Suziedelis and Potvin, 1981). It has been proposed that women identify God as a father; therefore, religion is more attractive to them than for men (Argyle and Beit-Hallahmi, 1975). The second possible explanation utilizes socialisation theory to argue that women's childhood experiences predispose them to value religion and involve themselves in religious activities (De Vaus and McAllister, 1987). The socialization of women particularly emphasises the resolution of conflicts, gentleness, nurturance, compliance and the type of expression that fits with religious values. In contrast, male socialisation involves more active values, self-images, and roles that are less connected with aspects of religious practice (Mol, 1985). In recent times, a third explanation for the stronger religiosity of women has been suggested. This highlights the influence of their structural location in their community. The structural location argument has three parts. First, it suggests that women's childcare role creates an increased commitment to religion, and second, lower rates of participation in work may have an effect. Third, women's attitudes toward work and family commitments may be given a different value compared to those of men (De Vaus and McAllister, 1987). Fourth, since women may not work outside their homes, they may have more time to take part in religious activities (Martin, 1967; Luckmann, 1967; Iannaccone, 1990; Azzi and Ehrenberg, 1975).

Although the idea that females have higher levels of religiosity than males is well documented in the literature, some authors, however, warn that there is inadequate empirical support to state the females are fundamentally more religious than males and more research is required (Miller and Hoffmann, 1995; Baker and Whitehead, 2016). In addition, Sullins (2006) supports the idea that females are often more religious than males, but the author is less certain that the phenomenon is universal. For example, in two major world religions, Islam and Judaism, men seem to be more religious and more spiritually active than women (Argyle and Beit-Hallahmi and, 2013; Roth and Kroll, 2007). Lazerwitz (1961) stated that although Christian females visit church more frequently compared to males, Jewish males go to the synagogue more often than women and report a greater trust in an afterlife compared to Jewish females. Likewise, Muslim men report more membership of the Mosques and greater attendance than Muslim women (Sullins, 2006). However, some

institutional barriers may prevent the involvement of women in religious activities, particularly as women report higher levels of religiosity on other measures than men. For example, in Islam, the organization, norms, beliefs and rituals of religion and culture in Muslim countries have a gender differentiating effect on the levels of participation between men and women. Moreover, many religious faiths distinguish between the religious duties of males and females, making more demands upon males to complete religious obligations including prayer and religious research. Conventional Judaism and Islam give fewer strenuous religious requirements to females than to males sometimes, especially because of the conventional distribution of principal homemaking and looking after children as female responsibilities. For instance, presence at religious worship might be reduced for Muslim and Jewish females than males (Loewenthal *et al.,* 2002). Jewish and Muslim females do not have to pray with other people, unlike males, therefore even very religious women are not forced to visit a place of worship. Muslim females are not allowed to visit a mosque in the days of their menstruation; therefore, the devout female has to be present at a religious place less frequently than a male. If females have responsibilities for their families, they might have less responsibility to pray and take part in religious research. Therefore, when measuring religious activity, Muslim and Jewish females might seem to be less "religious" compared to Muslim and Jewish males (Sullins, 2006). In addition, there is a considerable connectionbetween religion and innovation for both men and women. Assouad and Parboteeah (2018) suggest that a positive correlation exists between religion and innovation in either gender; thus, increases in religiosity are linked to increases in innovative activities. Several studies have demonstrated that religion has a positive connection with innovative activities including networking (Maillat and Leco, 1992) and work duties (Parboteeah *et al.,* 2009), which are vital for successful innovators (Lipparini and Sobrero, 1994).

### 4.2.2. Innovation and gender

Innovation is a principal instrument of economic competition and development, and, therefore, the creation of innovation is considered as an important subject of interest for economists (Baumol, 2010). Ljunggren *et al.,* (2010), Hage (2006) argue that innovation is an economic phenomenon that is certainly not isolated from social and psychological factors such as gender. A number of academic studies, Ostergaard *et al*., (2011), Wood (1987), have demonstrated that gender has positive links with innovation and the amount of research on

this theme has almost doubled every five years (Harrison and Klein, 2007). In addition, recently, the connections between gender and innovation have been increasingly researched by a number of different disciplines (Crowden, 2003; Kingiri, 2010; Johansson and Lindberg, 2011; Danilda and Thorslund, 2011).

It was shown that there are fewer female innovators than males and that predominantly male occupations tend to be more innovative compared to those dominated by women. Confirmation of this argument was found by a number of studies that discovered several differences between male and female attitudes towards innovation (Harrison and Klein, 2007, Wood 1987, Ostergaard *et al*., 2011, Marvel and Lee 2011). For example, Whittington and Smith (2005) emphasised that gender plays a major role in producing innovation as men create more patents compared to women. Another example was performed by Wood, 1987 "meta-analytic review of gender differences in group performance" showed that groups of women had fewer members when compared to groups of men who could answer arithmetic problems and could produce fewer creative results than their counterparts.

The existing research has highlighted several reasons for the differences between genders in innovation. First, women tend to attribute their work motivation to the creation of enough autonomy and flexibility to facilitate the priorities of their families (Fasci and Valdez, 1998; Still and Timms, 2000). Women usually use their activities to integrate their family and personal goals into those of their work or business. This might deter or limit women from experimenting and innovating because this would put the welfare of their families in jeopardy (Marvel and Lee, 2011). On the other hand, male goals are often focused outside the family. They direct their efforts toward the challenges of commerce and the creation of wealth (Bailyn, 1993). Research has suggested that men have greater financial motivations, whereas women often try to balance their work with family demands (Buttner, 1993; De Martino and Barbato, 2003; Fischer *et al.*, 1993). Male financial motivations allow them to develop their knowledge and encourage them to involve in innovative activates (Lin, 2007).

Second, Cohen and Levinthal (1990) confirmed that collaboration between various networks should greatly enhance innovation due to the variety and amount of knowledge

that can be shared. While there is strong positive interaction between networks and innovation (Salomon, 1998), gender differences among men and women exist in network tie composition. The composition of female networks was shown to comprise significantly fewer wealthy, powerful and less high-status members comparing to men (McGuire, 2000). In addition, female networks often consist of friends and family members which are different from the networks of men (Renzulli *et al.*, 2000). Female networks are frequently made up of people who already know each other and, in contrast, men's networks are largely more diverse and are made up of a variety of people who are not previously connected to each other (Ridgeway and Smith-Lovin, 1999).

Third, gender differences in innovation occur because of uneven admittance to financial funding. Ighomereho *et al.,* (2013) emphasised that access to finance is a distinct problem for female innovation. This study showed that women often use their own savings, loans from friends and relations or cooperatives and their principal sources of finance due to the negative attitude of banks and financial organisations. Likewise, the research was undertaken by Eriki and Okafor (2003) about discrimination by gender in micro-credit funding discovered that the Agricultural and Cooperative Bank discriminated against women in the disbursement of loans, which led them to suggest a cultural change in the methods of loan administration. However, the research into innovation has not considered the views of women about how easy they find access to the financial resources they require to be innovative nor studied empirically whether this access could be a major reason why male and female contributions to innovation differ.

The fourth reason involves the variation in education between men and women. It has been argued that education is an extremely powerful instrument to promote innovation (Ighomereho *et al.,* 2013). Sanditov and Verspagen (2011) argued that education might be a cause of gender variations in innovation. Individuals of both genders who are permitted to develop their potential fully through education are more likely to be creative and more likely to be involved in risky activities (Danilda and Thorslund, 2011). Moreover, education offers people the required skill and information to be thoughtful, original, ingenious, imaginative and innovative. Women worldwide still tend to have less likely to access education compared to men. They are often less experienced and assertive when they lack

education and training courses. This may result in a shortage of gaining the knowledge and skills required to spur innovative activities.

The fifth explanation for the lower levels of women's innovation was researched by Mudaliar and Mathur (2015), demonstrating that women generated many innovative ideas but they were less likely to be implemented by the organization. Poutanen and Kovlainen (2013) showed the women lack collegial support in putting into practice their ideas. Furthermore, research into organisational studies suggested that women are less likely to be perceived as innovators. As a result, their ideas are not given the same consideration as those of men and, thus, their ideas are less likely to be implemented (Cooper, 2012). This evidence demonstrates that it is not women who are lacking in the capacity to innovate but the difference in the way that their innovative ideas are treated by organisations.

Sixth, while innovation involves the enthusiasm to take risks (Tan, 2001), the risk motivation to innovate is varies between the two genders. It is argued that there is a strong link between innovation and risk-taking; and taking risks frequently results in more successful innovation. The innovation literature supports the idea that innovators are associated with risk-taking behaviour and taking risks increases innovation propensity (Cox, 1976; Howell and Higgins, 1990a). The adoption of innovation can be a risky decision that involves introducing a new service, produce or procedure (Taback and Barr, 1998). Generally, women identify risk more powerfully in other aspects of their lives; thus, they are expected to be less involved than men in risky activities (Miller and Hoffman, 1995). Harris *et al.,* (2006) confirm that women are less enthusiastic compared to men to be involved in risk-taking in numerous areas of life, such as physical activities and health and financial speculation (Eckel and Grossman, 2002) as well as making choices in the workplace (O'Connor and Fisher, 1999). Furthermore, from an economic perspective, using an investment game as a way to gauge the amount of risk-taking, Charness and Gneezy (2012) found that women make smaller-sized investments and are less comfortable making risky investments. Therefore, it can be argued that women can be seen as having less propensity to involve in innovative activities than men.

Despite the profound effects of religion and gender on economic prosperity and the considerable influence of religion on innovation (Benabo, 2015; Chan-Serafin *et al*., 2013,

Assouad and Parboteeah 2018), to the limit of our knowledge, this tripartite connections between religion, innovation and gender have not been explored. The previous research has focused on the general effect of religion on attitudes toward innovation while chiefly neglecting the clear role of alternative cultural and social factors including gender. Moreover, most of the previous literature explaining the links between religion and innovation propensity fails to supply a whole description of the ways individual features such as gender impact this association. Consequently, it opens questions concerning whether religion or religiosity influences gender innovation or the enthusiasm of women and men to become involved in innovative activity.

### 4.2.3. The role of women in the public sphere according to Islam

In the Kingdom of Saudi Arabia, there is a basic model for Muslim women to follow according to the laws of Islamic law. There are also some roles that society, customs and traditions may impose on her, which is the role of the Saudi woman as a mother or wife (Francis *et al.,* 2006). Yamani (2000, p. 96) stated that "although interpretations of 'correct' Islamic behaviour influence all sections of society, local customs, norms, and tribal traditions actually dictate women's roles and are enforced through familial structure". Littrel and Bertsch (2013) points out that the existing regulations in Saudi Arabia reinforce discrimination against women, and that religious regulations restrict the freedom of Saudi women. Despite this, the Kingdom of Saudi Arabia has been keen in the past thirty years to present an ideal image of the Saudi woman (De, 2006). The Kingdom has been keen to present a model of Saudi women who are committed to the teachings of Islam and have higher education and deep knowledge, as recommended by the Islamic religion. As education is one of the most important pillars of the Islamic community it has an impact on the state (Yaman, 2005). Among the effects and importance of education, Saudi women have been able to play a role in education, as most Saudi women work in teaching. And the role of women in the Kingdom of Saudi Arabia has become not limited to being a mother or wife and expanded to making important decisions and looking for new job opportunities (Mustafa and Troudi, 2019). Many Saudi women have been able to reach high positions in the state, which were previously only reserved for men. An example of this is the appointment of 30 Saudi women to the Shura Council in 2013. Despite this, Saudi women

face some challenges when they practice some economic activities such as innovation and entrepreneurship

Therefore, this study attempts to create a comprehensive understanding of the connections between gender, innovation and religion from an Islamic perspective. This research is intended to fulfill this gap in the knowledge so as to discover a more complete comprehension of the links between the religion Islam, gender and innovation. The following section focuses on the examination of how does Islam influence Muslim women and men's attitudes towards innovation.

### 4.2.4. Support mechanisms and restrictions for Saudi women innovators and entrepreneurs

The Saudi government has paid attention to the role of active women in society and has made efforts to encourage innovation and entrepreneurship among Saudi women (Fallatah, 2012). The government has established the King Abdulaziz Charitable Society for Women. One of the tasks of this association is to finance women's projects that are owned by Saudi women with limited income and are divorced or widowed (AMCL, 2010). In addition, the government was keen to establish the Centennial Fund, which provides financial support to young Saudi women (Al-Tit and Euchi, 2019). The fund aims to provide financial aid to young Saudi women so that they can achieve their entrepreneurial ambitions. There is also some support from private institutions such as the Abdul Latif Jameel Foundation (Alijohani, 2008). This organization works to provide financial support and innovation and entrepreneurship training for women in the Kingdom of Saudi Arabia (AMCL, 2010; Gavin, 2010). The Kingdom of Saudi Arabia has made clear progress in female entrepreneurship, as Vision 3030 aims to raise the participation rate of Saudi women in the Saudi market from 20% to 30% (GEM, 2020). Among the efforts made by the Saudi government to support Saudi women innovators is Honour and Motivation, which encourages these innovators to more creativity and innovation. The Kingdom also paid attention to the International Women's Day and invited all the Kingdom's women to participate in the achievements. It held seminars that focus on the needs of innovative women and discuss ways in which innovation can reach rapid development (Janz, 2019).

Despite these great efforts made by the Kingdom to support innovative women and entrepreneurs, there are many obstacles that hinder their progress. One of the most important obstacles that women innovators and entrepreneurs face is access to government services, which often require the presence of a male relative. When Saudi women intend to start their businesses, their access to government services is indirect, which wastes their time and effort (Danish and Smith, 2012). Alturki and Braswell (2010) confirm that only 38% of Saudi women innovators and entrepreneurs have registered their businesses themselves. There was also a discrepancy in the results in the cities of Riyadh and Jeddah, as 50% of the women in Jeddah recorded their work themselves, while in Riyadh only 1/3$^{rd}$ recorded and 1/5th in the Eastern Region. The reason for this discrepancy may be the social nature of Jeddah, as Jeddah is one of the most open cities in the Kingdom of Saudi Arabia (Al-Hathloul and Mughal, 1991). Furthermore,

Saudi businesswomen often face more complex restrictions and regulations than men Zeidan and Bahrami (2011) mentioned that some rules and restrictions are for women only, while men enjoy a wide range of facilities. The challenges faced by Saudi women may frustrate them and thus hinder their progress in the field of innovation and entrepreneurship. Women business owners, when they want to finance their projects, resort to their personal savings, or they may use loans from family or friends (Carter and Cannon, 1992). Carter and Cannon, (1992) suggest that there is often discrimination between genders in funding, especially by the people responsible for the funding due to bias issues. Therefore, the difficulties that Saudi women faced to collect funding may hinder their progress, because the problems in collecting financing may be a deterrent to women (Andersson *et al.,* 2007). Moreover, the prevailing culture in the Kingdom of Saudi Arabia may discourage Saudi women from pursuing innovative and entrepreneurial work. The values and customs inherent in Saudi Arabia prevent the mixing of the genders in the work environment (Baughn *et al.,* 2006). They also restrict women's freedom of travel and movement. Fenwick (2003) stresses that entrepreneurial activities require an acceptable amount of freedom, independence and speed of decision-making. Thus, Saudi norms and values can be a major reason for the lack of Saudi women's participation in entrepreneurial activities such as innovation (AMCL, 2010). Nevertheless, THamid and Sa'ari (2011) pointed out that the Qur'anic values encourage women to work and engage in economic activities

and entrepreneurship, which is the prevailing Islamic culture from the era of the Prophet Muhammad. Hamid believes that some of the teachings of Islam, such as the emphasis on wearing the veil, may be a key factor in the success of women entrepreneurs and innovators, as wearing the veil is a protection for them. Reeves (2010) stressed that maintaining the safety and security of female entrepreneurs is important in expanding and continuing their entrepreneurial activities.

## 4.3. The conceptual framework and hypothesis development:

### 4.3.1. Gender and the relationship between religion and innovation, an Islamic perspective:

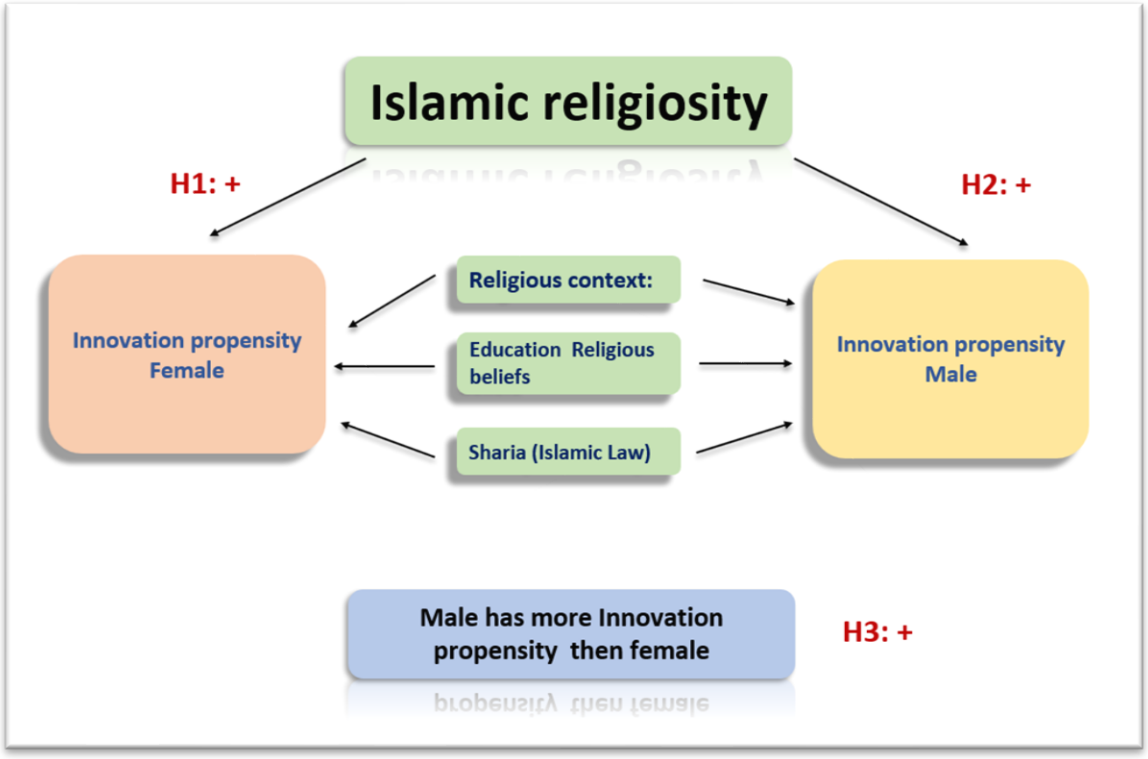


Figure (4.1): Conceptual framework and hypotheses development.

The above review of related literature has revealed that there is a considerable amount of work that corroborates the reality of a connection between innovation propensity and gender. However, the goal of this segment is to expand the existing research by the investigation of a hypothetical effect of gender in the relationship between religion and innovation in the context of an Islamic society. This study initially asks the following questions: (1) To what extent does Islam effect the innovation propensity of Muslim women? (2) How does Islam influence Muslim men's attitudes towards innovation? (3) Which differences are there between male and female Muslim attitudes towards the relationship between Islam and innovation propensity? In order to respond to the questions, it is important to build a comprehension of the differences and similarities between women and men as specified in Islam. Moreover, it is fruitful to emphasise that Islam is a wide-ranging religion (Tlaiss, 2013), which means that the principles of Islam do

not merely apply to worship of Allah, but in addition, the ways in which they should believe and behave throughout their lives in all activities, both spiritual and more practical ones. This study investigates the links between gender, Islam and innovation through the lens of institutional theory, examining the normative, cognitive and regulative aspects (Scott, 2008) to create a clear and profound understanding of this relationship.

### 4.3.1.1. Institutional theory:

#### 4.3.1.1.1. Normative dimension:

As mentioned in the previous literature, the normative dimension of Islam includes religious activity, norms and values which are derived from the Quran and the Sunnah. These elements are considered as important factors which together form an individual Muslim's behaviour (Abdrabboh, 1985). In fact, Islam states that both genders are equal in belief and self-respect and in worshipping of Allah (Yamani and Allen, 1996). The Holy Quran declares: ***"And I (God) created not the jinns and humans except they should worship Me (Alone)"*** [Adh-Dhariyat, 51:56]. In this verse, both men and women are referred to as 'humans', which confirms the genders are equal in the worship of Allah Almighty. Thus, it is assumed that both men and women are equally religious. Another verse of the Holy Quran expresses that males and females are equal in many respects when being punished or rewarded for either their positive or negative actions: ***"Verily, the Muslims men and women, the believers men and women, the men and women who are obedient (to God), the men and women who are truthful, the men and women who are humble, the men and women who give Sadaqat (i.e. Zakat, and alms, etc.), the men and women who observe Saum (fast), the men and women who guard their chastity and the men and the women who remember God much with their heart and tongues or praying extra prayers, God has prepared for them forgiveness and a great reward (i.e. Paradise)."*** [Al-Ahzab, 33:35] (Lamce, 2013).

On the other hand, while males and females are considered alike in the worship of God Almighty, they are encouraged equally by Islam to prosper innovation. Islam promotes men and women to be equally innovative can be seen in the Hadith of the prophet Mohammed (pbuh) where he said: a person who attempts to create a valuable innovation in

Islam is rewarded (Al-karasneh and Saleh, 2010). This establishes that the word "person" is merely the singular form of 'people' in which both women and men are equally valued when the importance of innovation in Islam is discussed. For example, the prophet Muhammad (pbuh) said: “there is no disease that Allah has created, except that He has created its treatment” (Isgandarova, 2005, p.91). This Hadith clearly encourages all Muslim men and women to seek the use of preventative and curative medicines and to improve medical practices that are obliged by Allah Almighty.

It can be seen that the normative aspect of Islam treats both men and women equally as regards worship and allows both of them to develop their innovation propensity. For example, Fatima Al-Fihri who was an innovative muslim woman; she was the first person to create a university (Fejzic, 2020). Furthermore, Maryam invented the astrolabe which displays how the sky appears in a specific place (Forsberg, 2013). However, obstacles exist that challenge Islamic women's innovation to a different extent compared to Islamic men. These restrictions might not from Islam as much as they are related to the culture and society of Islamic countries (Elamin and Omair, 2010; Hamdan, 2005). Despite the fact that Islam plays a crucial role in its followers' individual and working lives (Tlaiss, 2013, 2014a), the influences of socio-cultural norms and traditions on Muslims, particularly women, cannot be ignored. Alselaimi and Lord (2012) contend that although Islam allows women's work outside their homes, conservative people within Islamic social culture prevent genders mixing and promote the segregation of workplaces in order to forbid Muslim women from being influenced by the different lifestyles, values and priorities of their counterparts in the West. Following this argument, a growing number of researchers (Elamin and Omair, 2010; Hamdan, 2005) suggest that Islam is not actually responsible for the blocks confronted by Muslim females in Islamic countries; rather, the misunderstanding of the differences between Islam and social culture is to be blamed. These limitations might contribute to fewer Muslim women in the workforce and reduce their economic and innovative participation (Human Development Report, 2015). These socio-cultural traditions and values have strong effects on the organizational field; social prohibition of gender equalities is common in Islamic organizations. For instance, although women represent over 50 percent of teachers, they are seen as incapable of being in a managerial or decision-making role due to their gender alone (Alselaimi and Lord, 2012). The careers of women in Islamic countries

suffer because of the negative attitudes of male, patriarchal and community culture, creating numerous obstacles and complications to women's progress in employment. Madsen (2010) states that the challenges are connected to workplace culture and comprise discrimination, lack of training and development, employer bias and unhelpful perceptions of women's professional abilities and priorities. In addition, there are the challenges connected to issues outside the workplace which stem from wide-ranging societal factors which include work/family role conflicts, cultural barriers which hesitate to accept women in powerful roles and shortage of family support (Katttara, 2005; Tlaiss, 2014a, b; Al-Asfour *et al*., 2017).

In Islamic society, it is generally accepted by women that their responsibilities are seen as being subsidiary to those of men as power belong in the male sphere (Stowasser, 1996). Although most interpreters accept that within the Qur'an there are considerable physical and emotional differences between the two genders, however, it does not imply that this means men have dominance or benefit in law (Badawi, 1971, pp.17-18). Furthermore, Badawi explains the Qur'an (Sura 2:228) in this manner: "And they (women) have rights similar to those (of men) over them, and men are a degree above them" (Ahmad, 2003). In his commentary, Badawi comments that the Qur'an is referring to ordinary differences between genders which allow the more vulnerable females to be given protection without having implications about superiority. Although, frequently the Qur'an is understood as demonstrating that males should have the duty to provide for their family, men do not have unconditional authority over women (Vidyasagar and Rea, 2004). In addition, it does not imply that women are incapable of providing for themselves (Naseef, 1999). These traditions have been criticized, for example, by Al-Ghazali (1990) who argued that some customs in Islamic societies restrain women's mobility. Such traditions are often blamed on the religion itself, whereas on closer examination, they are not connected to Islamic religious ideas. He emphasized that Islam gives people a significant sense of balance between the two sexes. However, any differences are associated with the nature of humankind and various roles are assigned to males and females by society. Al- Ghazali maintained that many traditions are established by humans rather than God and it is these rules which delay women's development, keeping them in jahiliya, which is translated as ignorance (Sidani, Y., 2005). Al-Ghazali accused Islamic societies of being preoccupied with

keeping women in detention centres consisting of ignorance and creating psychological defeatism. Furthermore, he argued that in many Arab cultures, women are forbidden to have a political role or even a strong role in their community, in schools or in social affairs (WIMR, 2017). Following this, Al-Gazali (1989) emphasised that due to social and cultural expectations, women have experienced a barrier to participating in economical and innovative activities being constrained to working in domestic roles. Thus, modern female intellectuals tend to reject religious traditions which have been incorrectly blamed for limiting their aspirations and progress. Accordingly, he suggested that there should be a revolution in the way these issues are discussed to allow a modification in those traditions which are inaccurately credited to Islam (Watt, 2020). The school of thought connected to Al-Ghazali additionally considered the idea of women wearing a veil, following his assertion that God commanded women to cover their heads with a scarf, which is true but does not prevent these women from participating in both economic life or creating innovations (Sidani, Y., 2005). It was indicated that the prevalence of covering women's faces which is widespread in some Muslim societies, is essentially connected to traditional cultural norms rather than to the prohibitions of Islam (Yamani and Allen, 1996).

Tambunan (2009), Roomi and Parrott (2013) and Kantor (2002) suggest that there is increasing evidence that cultural values and norms can act as a constraint for female innovators in developing countries (Kantor, 2002). In Islamic countries, for example, women are subject to cultural norms and practices that increase their limitations (Roomi, 2012, Roomi and Parrott, 2008) and contribute to a reduction in women's innovation and prevent them from developing themselves (Ilhaamie *et al*, 2014). In the developing countries of South Asia in both Muslim and Hindu societies, Roomi (2012) and Kantor (2002) found that women are not encouraged to work outside the home by their families and communities leading to a limitation of their knowledge, their mobility and their access to markets and, therefore, limits their innovation. Leonard and Sensiper (1998) emphasise that if norms limit knowledge, this limitation prevents innovation since knowledge is a vital asset for all activities and most particularly for innovation.

Moreover, the norms that are developed in a male-dominated society religion might be used as a means to promote the interests of men over women. Mahmud (2011) highlights that in the context of developing countries, there are structural inequalities that

females experience because both the family and the community are male-dominated and they do not support women venturing outside their homes. Roomi and Parrot (2008) noted that although the Quran does not prevent female work outside the family home, in many Muslim societies, it is normal for them to remain secluded. This is confirmed by Ahmad (2011), whose study argued that women in Islamic countries are not encouraged to go to public places as their place is seen as being in the privacy of their homes which limits their economic, political and social opportunities. Therefore, Muslim women cannot create and strengthen their networks which are considered as an important factor for innovation (Hansen *et al.,* 2005). Leenders and Dolfsma (2016) emphasised that innovation is a team sport where interaction with other individuals or organisations inspires the inventor. Previous literature emphasises that women's networks are important for innovation; thus, unless the conditions in societies promote women networks, women will be less likely to be involved in innovation (Wuchty *et al.,* 2007).

Although the Holy Qur'an encourages Muslims, both men and women, to engage in economic activities and entrepreneurship, the culture of society in the Kingdom of Saudi Arabia might discourage women to participate in entrepreneurial activities such as innovation. Saudi customs and values prevent the mixing of women and men at work, and they also prevent and restrict women's travel (Baughn *et al.,* 2006). Innovation and Entrepreneurship require complete freedom, independence and speed of decision-making (Fenwick, 2003) . Therefore, it is believed that laws and social norms are a key factor for the lack of Saudi women's participation in economic activities such as innovation (AMCL, 2010). Nevertheless, Vargas-Hernandez *et al*., (2010) stressed that the norms and values derived from the Qur'an and the Sunnah of the Prophet confirm that entrepreneurship is part of the Islamic culture. THamid and Sa'ari (2011) confirmed that, values and norms of the Qur'an encourage Saudi women to become entrepreneurs, and he believes that the norms that obligate women to wear the veil are a protection for them. Reeves (2010) believes that the safety and security of women entrepreneurs is important to their success and the expansion of their activities. This reveals how Quranic values are contributing factors in protecting women entrepreneurs and their successes (Fallatah, 2012).

#### 4.3.1.1.2. Regulative dimension

The previous section is an explanation of gender and the relationship between Islam and innovation through the first diminution of institutional theory (Normative Dimension). In order to clearly comprehend the relationship more profoundly, this section uses the second diminution of institutional theory, the regulative dimension. Finke (1990) and Starke and Fink (2000) suggest that the regulative dimension of religion is demonstrated by the laws concerning religion in a country. In Islamic nations, Sharia is a significant sign of the regulative dimension as it both creates the laws and controls individual behaviour. However, although Sharia guarantees human rights for both men and women, equality of responsibilities between the genders is not the same (Dastebala *et al.*, 2014). For instance, in Islam, Muslim academics highlight that males and females have dissimilar fiscal rights and responsibilities (Kazemi, 2000). When a man and a woman are both related in the same way to a deceased person, the woman would only share half of the inheritance compared to the share which the man is entitled. This is directly instructed by the Quran: ***"God commands you as regards your children's (inheritance); to the male, a portion equal to that of two females"*** [An-Nisa', 4:7]. Such a variation between males and females in Islam exists because males have a fiscal responsibility to maintain their families. Gbadamosi (2012) noted that the variation between male and female is clarified in the verse of the Holy Quran which says that ***"the father of the child shall bear the cost of the mother's food and clothing on a reasonable basis"*** [Al-Baqarah, 1:233]. As stated by Tafsir Ibn Kathir (a comprehensive and complete explanation of the Holy Quran), the parents have different responsibilities with regards their children; fathers, depending on their financial circumstances, should look after their wives and children by providing their needs including drink, food, shelter and clothing. Sharia holds Muslim men responsible for earning enough money for the sustenance (Rizq) of their families which necessitates their involvement in economic activities. Khalifa (2001) asserts that it is imperative that all Muslim men should seek rizq from God Almighty which is the direct cause of greater participation in economical and innovative activities compared to women as this makes their family lives sustainable. Foellmi and Zweimuller (2006); Galindo and Mendez-Picazo, (2013); Stone *et al.,* (2007) found that a positive relationship exists between income and innovation which is encouraging economic activity. Antikainen (2010) suggests that the main factors which

motivate individuals to innovate are financial responsibility, monetary rewards, care of the family and necessities. Moreover, Tylecote (1994) confirms that the key features of innovation are financial responsibility and commitment. Therefore, in Islam, arguably, men are often more highly motivated to innovation than women as they are financially responsible for their families to a greater extent than Muslim women.

Another factor which limits Muslim women's innovation is the lower amount of access they have to government services compared to men (Alturki and Braswell, 2010). Lusch and Nambusan (2015) asserted that to facilitate innovation processes it is necessary to have easy access to various resources and services as well as investing time and money. Forinstance, at King Abdulaziz City for Science and Technology (KACST) and the Saudi patent office, which are government innovation services, women's access is often indirect as they need to use a male relative to deal with these services (Shin *et al*., 2011). This is due to that Islam prohibits women from interacting with men who are not their relatives. However, although a royal decree in 2003 required the creation of women's sections in government departments to overcome this problem, this implementation of the decree lacked sufficient authority (Ahmad, 2011). Consequently, women are lagging behind in innovation compared to men who have full access to services and facilities for innovation.

Alturki and Braswell (2010) stressed that there are a small number of women who registered their businesses themselves, most of the women depend on their husbands, fathers, or brothers. Statistics showed that only 38% of women business owners were able to register their companies themselves. In addition, there is a discrepancy in the percentages between cities, where the city of Jeddah had the highest percentage. In addition, there are many complex laws that are barriers to Saudi female entrepreneurs. Zeidan and Bahrami (2011) stressed that these laws are often only specific to women, while men enjoy a high level of facilities. Female entrepreneurs resort to financing their own projects from their own savings, or they may borrow from friends and family due to the difficulties they face in accessing financing (Carter and Cannon, 2007). Carter emphasized that gender discrimination in financing exists in most societies for reasons of bias, and this bias is often issued by persons responsible for financing. Thus, the challenges that Saudi women entrepreneurs face in order to obtain financial support may be an obstacle to the

development of women's entrepreneurship and innovation, as the problems of funding are considered a deterrent and directing factor for women (Carter and Cannon, 2007).

To further understand this challenge, Esposito and DeLong (2001) explain how some principles established by Islam restrict women in particular, the 'male guardianship system' by which the father, brother, son or husband of a woman makes critical decisions on behalf of the woman. This means that women can only travel with permission from a male relative (Ross, 2008). The reason for this restriction is because the prophet Mohammad (pbuh) said, "No man must be alone with a woman except in the presence of her Mahram (relevant)". In this Hadith, Mahram means male relative (Battour *et al.*, 2010 p 461). The result of this Hadith is that access to services required for building innovation can be hindered as well as training for innovation (Baki, 2004). In addition, Aslam (2015) stated that these restrictions might lead to a limitation of both the autonomy of Muslim women as well as their freedom to innovate. Fenwick (2003) confirmed that the energy for innovation requires freedom and independence. Moreover, Heunks (1998) emphasised that creativity and innovation require individuals to share personal backgrounds including a high amount of freedom and independence. Therefore, while Muslim females are not permitted to travel without a male relative and lack independence and freedom which encourage innovation therefore Muslim women lack some of the qualities that produce a successful innovator. In conclusion, it is clear that the challenges and restraints that might delay Muslim women's ability to succeed in innovation compared to Muslim men derive from culture and society more than being from Islam (Vidyasagar and Rea, 2004; Al-Asfour , 2017 ; Sidani, 2005).

#### 4.3.1.1.3. Cognitive dimension

In order to study this relationship even further, this research uses the third dimension of institutional theory, viz. the cognitive dimension. According to Scott (2008), the cognitive dimension covers the cognitive constructions and social understanding shared by the inhabitants of a particular country or region. The cognitive side of an institution consists of communal ideas that shape reality (Garrison *et al.,* 1999, Boyatzis *et al.,* 2002, Aikenhead and Jegede, 1999) indicates that one of the important aspects of the cognitive dimension is education. Thus, this study investigates gender and the links between Islam and innovation through education, which is a central part of the cognitive dimension.

From an Islamic point of view, the Islamic research that has been published in Arabic makes many contributions to education and knowledge. The principal foundations of Islam, including the Holy Quran and the Sunnah, have many sections that encourage both genders men and women to seek knowledge and emphasise the importance of education (Esposito, 2003). In fact, the Islamic teachings referred to by these texts encourage Muslim women and men not only to gain religious understanding as well as to discover all other types of life knowledge that might improve the quality of humans. Kaur (2013) asserts that Muslim scholars in all times ought to create appropriate Islamic solutions to survive the trials of the contemporary world. The importance of education for Muslims is demonstrated by the first word of the Holy Quran: ***"Read! In the Name of your Lord, Who has created (all that exists), [Who] Has created man from a clot (of coagulated bllod0, Read! And your Lord is the Most Generous, Who has taught (the writing) by the pen [the first person to write was Prophet Idrees (Enoch), [Who] Has taught man that which he knew not."*** [Al-Alaq, 96:1-5] (Arzy *et al*, 2005). This former verse addresses both men and women alike. God Almighty clarifies the importance of knowledge and education when He demands the prophet Mohammed to pray for the discovery of knowledge in the Quran: ***"[Mohammed] say My Lord! Increase me in knowledge"*** [Ta-Ha 20:114] (Rice, 1999). Moreover, Mohammed encourages all Muslims both genders to seek for knowledge stating, "Seeking knowledge is an obligation on every Muslim." (Rahman and Muktar, 2014, p.19). These verses and Hadith show that human knowledge of the world is limited and, therefore, humankind must increase their knowledge. Thus, education and the gaining of knowledge are essential parts of Muslim's outlook on life (Halstead, 2004).

It is apparent that Islam creates the foundation for education and encourages both Muslim males and females to increase their knowledge and gain new skills. These new skills help them to think clearly, to understand the difference between right and wrong and to have the ability to analyse and make decisions, which are all useful skills for innovation. Mumford and Gustafson (1988, p.38) argued that acquiring an education is necessary for innovation as "an educational system that supports autonomy or builds self-esteem might increase the likelihood of innovative achievement." Ubius and Alas (2012), in a study on the impact of commercial social responsibility on innovation, showed that there is a significant positive connection between innovation and education. Similarly, Tabata and Johnsunrud

(2008) conclude that there is a bidirectional increase in education linked with increases in innovation.

Although Islam has promoted education for women and men, the education systems in Muslim countries have imposed certain restrictions which limit the extent of women's orientation towards innovation. The first restriction concerns the different treatment of men and women by the Islamic education system due to the different expectations of their roles in society. A differential tracking system directs men and women into different courses with the women's subjects studied being more limited than those of men (Hamdan, 2005). Moreover, the subjects available to study for women in universities have different curricula to those that are available to men (AlMunajjed, 1997). For example, men learn about male activities while women learn about nurturing roles like those of housewives and mothers. Baki (2004) confirmed that Muslim women have limited entry into certain fields of study which might encourage innovation. For instance, Entrepreneurship, Engineering and Pharmacy courses that teach the characteristics and requirements of innovation exclude women (Stevenson *et al*., 2001). Aldosary and Nahiduzzaman (2010) asserted that these fields are reserved for men who are in addition permitted to use the best laboratory and research facilities.

The second restriction that limits Muslim women's innovation is that the education system reduces their access to certain jobs that encourage people to be innovative. According to recent research, most Muslim women are training for teaching and administrative work which limits their access to the labour market which, therefore, limits innovative potential (Cordesman, 2003). The reason for being teachers and administrative workers seems to be that these occupations are similar to the domestic roles of women and use the stereotypical qualities of caring, service to others and nurturing. On the other hand, these types of jobs are in addition religiously suitable as they maintain the segregation of different genders when women work together in separate work environments (Baki, 2004). The reason behind that is Islam prohibited men from interacting with women directly; the prophet Muhammad (pbuh) said, "Avoid (entering a place) in which are women (uncovered or simply to mix with them in seclusion)" (Athman, 2015, p.36).

For the former discussion, we can argue that Muslim men receive a wide range of education and training which gives them more opportunities for innovation and production comparing to Muslim women (Cordesman, 2003). Thus, this study assumes that the effect of Islam on innovation propensity is significantly greater for Muslim men compared to Muslim women, leading to the following hypotheses:

***H1a***: ***The effect of Islamic religiosity on innovation propensity is positive among Muslim women.***

***H1b: The effect of Islamic religiosity on innovation propensity is positive among Muslim men.***

***H2: The positive effect of Islamic religiosity on innovation propensity is greater for Muslim men compared to Muslim women.***

## 4.4. Methodology:

This section concerns the research methodology behind the present study, which contains definitive assumptions creating a particular approach, suitable data collection methods, a clear design and an appropriate analysis enabling an enhanced understanding of the area under discussion. It was argued by Easterby-Smith (2012) that research methodology should answer a particular set of questions to demonstrate how researchers are able to create an understanding of a phenomenon in society and which methods are preferable to illustrate this knowledge. Following on from this, the philosophical assumptions of a study are strongly related to the process of the methodology. Therefore, the methodology that is explained in this section contains firstly, the philosophical framework of the study and secondly, the methods which have been selected to answer the research questions.

### 3.4.1 Research philosophy and paradigms:

#### 4.4.1.1. Ontology:

Initially, the ontological factor, which concerns questions about reality and the subject's concepts and categories, has to be established as well as how they relate to each other, thus showing the investigator's assumptions regarding how the world works. This is defined by Duberley *et al.,* (2012, p.17) as "the essence of the phenomenon and the nature of its existence". The researcher's assumptions about what reality is like must be clear, as shown by Easterby–Smith *et al*., (2012), because it must be emphasized that the phenomenon being studied really exists, rather than being something people perceive or know about when their attention is drawn to it. Thus, the decisions that the researcher has made need to be clarified (Symon and Cassell, 2012). The points of view about social reality are the social constructionist, or subjectivist and the realist or objectivist. The first of these suggests that a given social phenomenon is actually formed by an individual's perspective and concerns both the actions of the individual in society and the existence of the phenomenon itself (Collis and Hussey, 2013). In contrast, the realist school argues that the world and social units exist apart from the human participants and separate from cognitive constructions. The positivist maintains that the world is fixed and has a reality of its own, whereas according to the subjectivists, reality develops in nature and is more diverse, being

created socially. People tend to make sense of situations as part of a social group, developing ideas and considering their experiences through their day-to-day interactions (Martin and Sugarman, 1996).

This research investigates the impact of gender on the connection between Islamic religiosity and innovation propensity. Moreover, the influence of gender on the links between Islamic religiosity and attitudes towards innovation exists in reality outside the social participant. Therefore, in the current research, the approach is objective.

#### 4.4.1.2. Epistemology:

Questions about epistemology are similar to the ontological examination of reality; the researcher needs to demonstrate how they know about reality. During the study of knowledge, it is necessary to clarify the relationship between the facts that are to be examined and the researcher and it is particularly important to define the evidence that is supporting the knowledge (Guba and Lincoln, 1994). Moreover, the epistemology of a study shows which assumptions the researcher makes when questioning the nature of society (Easterby-Smith *et al*., 2012). Once again, the positivist school of research considers that a social phenomenon is a discrete knowledge and it can be quantified as well as observed (Collis and Hussey, 2013). Like natural scientists, a research philosophy allows an examination of the subject that is both independent and objective (Lewis *et al*., 2007). This perspective believes that objects have a clear meaning which exists apart from the researcher's understanding and principles (Crotty, 1998). Therefore, for positivists, knowledge is either true or false and, in addition, it is precise, fixed and can be described using precise numbers, statistical analysis and scientific methods. As the evidence or data is already in existence, the work of the researcher is to collect it and then organize and present it, although it is vital that the values and perceptions of the researcher do not falsely represent the evidence (Collis and Hussey, 2003). Thus, it is possible to use quantitative research which is suitable for the positivist paradigm, presenting the data in a tangible, measurable system.

Collis and Hussey (2013) suggest that the positivism paradigm approach is useful when studying human behaviour in a similar way to natural science research. The present research is intended to examine individual behaviour within the framework of religion and

innovation, more precisely, the impact of gender on the relationship between Islamic religiosity and innovation propensity. Thus, positivist philosophy is regarded as being appropriate for completing this survey. The theories of the study will be tested using survey research, analyzing the empirical data in order to produce a range of conclusions. As noted by Bhattacherjee (2012), positivist research primarily employs concrete, quantitative data to demonstrate its deductions.

#### 4.4.1.3. Axiology:

Following on from the above discussion, it is important to be aware of the issues concerning axiological assumptions. In the context of a study, certain values and objects are perceived as being particularly valuable. Given that positivist researchers are separate from the subject being explored, rather than examining the links between the issues under discussion, it is argued that the resulting studies are value-free (Easterby-Smith *et al.*, 2012). Consequently, the philosophical position of the current research is based on three basic assumptions; the ontological position is objectivism, the epistemological stance is positivism and the axiological is value-free due to the separation of the researcher from the issues which are being examined.

### 4.4.2 Research approach:

Research design is seen as "the plan and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis" (Cresswell, 2009, p3). Several decisions must be made, using the researcher's assumptions outlined above concerning the phenomenon that is being investigated. Additionally, it is important to describe the methods of data collection, the analysis of this data and discuss how the survey results will be utilized and explained (Creswell, 2009). Following this process is a clarification of the study's approach. It is vital to not only be aware of the philosophy related to the research but in addition to clarify how the questions to be studied are selected and phrased. It was argued by Taylor and Bogdan (1984) that different research methods have their own strengths and weaknesses. In addition, both valuable and weak studies are arguably carried out using both quantitative and qualitative methods (Flick, 2002). Therefore, there is no unique approach that is suited equally to all studies; rather, it is important to choose a suitable approach based on the specific research and the particular

questions which are being addressed. Given that both qualitative and quantitative methods are instruments, they require varying abilities. Each researcher has particular preferences as regards the analysis of qualitative data, which involves cultural observations or language or the statistical analysis of quantitative data and much depends on the decisions they take regarding how to approach the research questions (Kvale, 1996). Therefore, it is important that the chosen epistemology is related closely to the quantitative or qualitative methods that are selected. Anderson *et al*., (2009) argue that positivist researchers may prefer quantitative data while interpretivists tend to prefer qualitative data. One alternative approach is to use mixed-methods technique which utilizes a mixture of quantitative and qualitative study methods (Anderson *et al*., 2009).

Researchers frequently discuss whether it is preferable to follow a quantitative or a qualitative approach and despite disagreement about the development of the two methodologies, there is consensus about the implications of each method and their practical consequences. It is thought that quantitative methods are more suitable for studies that aim to assign numerical values to observations or to create a mulitifaceted account (Brynard and Hanekom, 1997). Moreover, quantitative research applies a number of methods to plan various groupings; thus, it is possible to represent the respondent's different experiences and views utilizing a numerical method (Creswell, 1996). By this process, researchers can validate a large range of variables in some detail and quantitative methods mean that fewer differences in response can be obtained. However, the qualitative method which uses data from sources such as observations, interviews and documents is able to understand social phenomena and describe them in a more nuanced way (Myers, 1997). Finally, it is possible to use mixed methods, both quantitative and qualitative to produce an insight that may reveal more information (Bryman, 2006; Bryman and Bell, 2007). Research into the experiences of workers in human resources that looks at their actions as well as ideas could be carried out using both methods, quantitative and qualitative, to thoroughly investigate the objectives of the research. Although this mixed-methods approach is favoured by some researchers, for example, Anderson (2009), the use of multiple approaches may result in problems including a shortage of time and lack of suitably qualified staff. If research is limited by time factors and the availability of expertise and resources this method is not preferable.

This demonstrates that choosing quantitative research has to be based on a number of factors. First of all, this study utilizes a positivism paradigm because Bhattacherjee (2012) states that this is most appropriate for quantitative methods. Secondly, this study aims to quantify the impact of gender on the connectibetween Islamic religiosity and innovation propensity. Thus, the current study utilizes quantitative data rather than qualitative data obtained from a questionnaire since this method matches the philosophy underpinning the study best as well as the phenomena which are under investigation.

### 4.4.3 Research design:

There are two alternative methods of data analysis, namely, deductive and inductive research paradigms and the issues surrounding the choice of approach have been debated by several authors (Cavaye, 1996, Tashakkori and Teddlie, 1998, Eltawheel, 2011). Firstly, deductive research, as clarified by Hussey and Hussey (1997, p19), is research in which a conceptual and theoretical structure must be developed. This is then tested utilizing empirical observation by which particular instances are deduced from general occurrences. Bryman and Bell (2015) argued that deductive theory is an accepted process used to understand the relationships between theory and research. The methods involve a procedure that moves from examining general information and refining it to construct specific facts, which is known as a top-down procedure. The second kind of research, inductive reasoning, develops new theories by observation of empirical reality and then generating inferences from more specific phenomena, thus moving from individual situations to descriptions of general patterns or laws. Clearly, this is the opposite of the deductive method and it is frequently described as being a bottom-up approach.

Subsequently, the present research will use quantitative and objective methods to gather the data which will then be analysed using a deductive approach to examine the impact of gender on the connection between Islam and innovation propensity as this is most appropriate. An institutional theory will thus be developed, resulting in a testable hypothesis; the positive effect of Islamic religiosity on innovation propensity is significantly greater for men compared to women.

### 4.4.4 Data collection method:

#### 4.4.4.1. Survey:

The main method of collecting data for this survey follows the suggestions of King and Horrocks (2010) who deem it necessary to clarify how the main body of data was gathered. The central data of a study can be acquired using semi-structured survey methods produced by either interviews or standardized questionnaires to assemble data about individuals, their ideas, behaviours and preferences in a clear, systematic way. There are two principal varieties of surveys; interviews, including individual, group, telephone and by fax (Fowler *et al*., 2002; Mingers, 2001; 2003).

A study using survey methods has a number of assets in comparison with alternative approaches. Firstly, it accesses a large range of facts about the respondents, including some data that is not directly observed, including an insight into individual preferences, beliefs, conduct and self-reported behaviour. The use of explanatory data can accurately describe a problem or event and additionally, it can put a spotlight on the causal relationships that are occurring (Anderson, 2009). Secondly, it is possible to obtain the data remotely, which is useful when the population to be described is too large to be observed directly; an entire country can be studied as long as the relevant sampling methods are followed to ensure that the various sections of the populations are represented properly. Thirdly, survey research is cheaper and maybe less time-consuming and give increased efficiency when compared to alternative methods, including experimental research and individual case studies. Nevertheless, it is vital to note that it is possible for bias to enter into the research, as well as non-response bias and sampling bias (Bhatterjee, 2012). By investigating diverse situations, beliefs, opinions and events in a particular population and developing a theory, survey research discovers causal relationships (Pinsonneault and Kraemer, 1993). As argued by Bhatterjee (2012), a questionnaire is preferable to interviews as data can be gathered from many respondents more cheaply and quickly than other methods. Therefore, the present research used a questionnaire to collect data from 1000 participants who are Muslim individuals living in Saudi Arabia. A pilot study was carried out, with 20 individuals, in Saudi Arabia, to ensure the viability of the research and gain feedback on the clarity of

the questions. The research data was collected during March and April 2019 using email ids acquired from SAASI.

### 4.4.4.2. Sample and sampling techniques:

It is possible to define a research population as being a whole group of individuals, items of interest or occurrences that an individual study proposes to investigate (Sekaran and Bougie, 2016). However, it is impossible to acquire data from the entire target population as cost constraints and time issues would make the research unfeasible. Bhatterjee (2012) suggests that a precisely collected subset of data can be seen as representing an entire population. Therefore, it is necessary to use a suitable sampling method that will accurately represent the population that the study is interested in, as has been carried out in the present research.

Moreover, it is important to follow several sampling stages, firstly choosing the required population, secondly, selecting a sampling frame and finally selecting a sample, utilizing common sampling techniques (Bhatterjee, 2012). The present research is investigating the effects that gender has on the connection between Islamic religiosity and innovation propensity; therefore, the focus will be on the Muslim population of Saudi Arabia. The unit of analysis is an individual Muslim and the sample frame of the study consists of a computerized list that contains the email IDs of 15,000 Saudi Muslims, obtained from the Saudi Arabia Authority of Statistics and Information (SAASI). According to Patton (2002), quantitative studies depend on probability sampling which is a technique by which each unit of the population has an opportunity, or non-zero probability, of being chosen for the sample and the chance can be demonstrated precisely. It is felt that this technique is suitable for the present research as Muslims, in general, are being investigated and it is important to represent all different members of the society in the sample. For this reason, the sampling techniques will utilize two probability sampling stages. Firstly, stratified sampling was undertaken, where the sampling frame is divided into homogenous subgroups that consist of Saudi Muslim males (7635) and females (7365). Secondly, systematic sampling is carried out in which the sampling frame is organized depending on certain criteria and at regular intervals, factors are chosen utilizing the formula $k$ element = N/$n$ where $k$ is the interval, N is the sample frame and $n$ is the sample size (Bhattercherjee,

2012). Therefore, the interval *k* =N/*n* that is k = 15000/1000 that equals 15. The reason for selecting random sampling is that these statistical sampling techniques are unbiased estimates of the population parameters and do not require weighting (Bhattercherjee, 2012). It is vital that a decision is taken regarding the sample size for quantitative research. This can range from 300 to be comfortably valid, through 500 to give good validity or as much as 1000 for exceptional validity (Tabachnick *et al*., 2001). In the case of the present research, it was considered that a sample size of 500 Muslim males and 500 Muslim females was appropriate.

### 4.4.5 Variables:

#### 4.4.5.1. Measures of Islamic Religiosity, (IR) the independent variable:

Hill and Hood (1999) suggest that although the principle measurements of religion described in existing literature are useful to measure religious psychology, they were principally developed to study the beliefs of Christians and the followers of various other non-Muslim faiths. Furthermore, Mc Farland (1984) suggests that these scales may be suitable to study Christianity, but they and not fit for purpose in examinations into the psychological features of Muslim beliefs and activities. For the present study, it was deemed important to clarify exactly what Islamic religiosity means. Islamic religiosity can be seen as a multi-dimensional concept that can be explained in a combination of ways (Alsanie, 198; Galbraith *et al*., 2007). The first dimension consists of Islamic beliefs which include the belief in Allah, in prophet Mohammad, in Allah's Angels, in the Books, in the Messengers, the Day of Judgement, the Afterlife and Predestination which are elements of the six pillars of Islam. The second dimension is Islamic conduct which covers the actions and behaviours of individual Muslims while they are living their daily existence, for example, prayer, chastity, fasting and, importantly, the pilgrimage to Mecca. Furthermore, Muslims should follow Islamic principles and abstain from all kinds of forbidden acts and conduct. Krain (2010) stated that often the methods of assessing Muslim religiosity are translated from English studies into religion without amendments from western Muslim academics. Now it is important to use more suitable methods to examine the issues which affect Muslims living in Muslim societies (Zelekha *et al*., 2014). Therefore, in this study, the Islamic religiosity

measurement is mainly founded on a scale of religiosity based on the factors which will more accurately measure Muslim beliefs and behaviours (Alsanie, 1989).

With the intention of measuring the various dimensions of Islamic religiosity accurately, the present research examined the mean score of the aggregate answers of individuals' answers to the normative, regulative and cognitive questions. In the survey, respondents were asked to specify their religious Activities and beliefs in 30 questions using five points Likert scale. The study uses the following categories: 1 = "strongly disagree" or "Never, 2 = "Disagree" or "Rarely", 3 = "Not sure" or "Sometimes", 4 = "Agree" or "Very Often" and 5 = "Strongly agree" or "Always". This results in a scale giving a range of scores from 30 to 150 and a higher score means that the respondent is demonstrating more Islamic religiosity. The first dimension, the normative aspect of religion denotes the amount that people value their religion (Assouad and Parboteeah, 2018). In 2000, Myers suggested that the greater value that people place on religion is related directly to them being more or less likely to practice religion. Therefore, in this study, the individual responses to the normative component, which reflects religious practices and values, are combined. Thus, the normative dimension is actually measured using sixteen items which represent the score of the group of individuals who state that they pray, fast for Ramadan and give to charity. For example, I make the obligatory prayers, I declaim the Qur'an, I complete the required fasting, I accomplish the extra fasting, I say to other people things that are untrue, I donate the supererogatory charity, I promote virtue and prevent vice, I obey my parents, I try to smile as much as possible, I pay visits to relatives, I care about neighbours, I fulfil my promises ,I follow the Islamic code of dress, I do not abuse others, I help old people when they need it, I perform Umrah. Secondly, in this study, the cognitive dimension is measured using ten different questions which represent the score of an individual's religious beliefs (Parboteean *et al.,* 2015). In the cognitive dimension, respondents answered questions about the degree to which they believe in Allah, in hell, heaven and the afterlife. For example, I believe there is no God but Allah, I believe Mohammed (pbuh) God's Messenger, I believe in God's angels, I believe in God's books, I believe in God's messengers, I believe in afterlife, I believe in predestination, I believe in hell, I believe in heaven. Finally, regarding the regulative dimension, Audretsch *et al.,* (2013, p777) confirm that Islam adds new elements to the regulatory dimensions of society, which are derived directly from the Holy

Quran. In this section, respondents were asked to respond the statements such as; I accept usury, I attempt to bribe if necessary, I obey Sharia rules in every situation. More details of this are in appendix (1).

### 4.4.5.2. Measures of Innovation propensity (IN) the dependent variable:

When deciding which measurement of innovation is appropriate, it is necessary to categorize the scale items which are grouped within the issues of innovation propensity. There are sixteen scale items that demonstrate the attitudes of the respondents towards such factors as change, risk-taking and new ideas (Benabou *et al*., 2015). The primary category covers attitudes towards new ideas, including novelty and creativity. An example of this is 'decide which is better: ideas that have endured for a long time or new ideas?' and another is 'It is important to do things one's own way'. The second category covers attitudes towards change. Questions asked include:' I am worried about the problems that might be caused by change' or 'I welcome the potential that something new is being created'. Lastly, as Rose-Ackerman (1980) confirms, as risk-taking is essential to innovation propensity, risk-taking attitude is measured by questions including: 'I believe that adventure and taking risks is important to this person to have an exciting life'. In analyzing and interpreting the innovation propensity data, respondents were asked 16 questions on the Likert scale. The categories were: 1 ='Strongly disagree'; 2 = 'Disagree'; 3 = 'Not sure'; 4 = 'Agree' and 5 = 'Strongly agree' or 'Always'. This creates a scale that has a range of scores from 16 to 80 and a higher score signifies more attitudes to innovation. For more details, see the appendix (1).

It was also noted in this research that a number of socio-demographic variables need to be controlled as these factors may influence the attitudes of Muslims towards innovation. The related existing empirical literature proposes that factors including age, gender, education, creativity and work experience all have the potential to affect attitudes towards innovation (Miller, 2004, Ferguson *et al*., 2014, Benabou *et al*., 2015). Therefore, the data analysis must control for gender and Entrepreneur using binary variables (0/1 values). Educational attainment is controlled utilising continuous variable. Age is measured in years and the data concerning work experience utilising continuous variable. For more details, see appendix 1.

### 4.4.5.3. Reliability and Validity

One definition of reliability is the amount to which the measurement of a particular concept is dependable or consistent (Bhattacherjee, 2012). Therefore, if a certain scale is used to measure a concept numerous time, the findings ought to be similar every time unless the phenomenon under observation is changing. Cronbach's alpha reliability coefficient is generally used in research to test the reliability of the scale; a value between 0.50 and 0.70 indicates reasonable reliability and a value of 0.70 plus is thought to show high reliability (Hinton *et al*., 2014). In the current research, the overall scale was shown to have strong internal consistency with an alpha value of 0.80 for Islamic religiosity, 0.79 for normative dimension, 0.86 for the cognitive dimension, 0.69 for the regulative dimension and 0.76 for innovation propensity.

Moreover, the validity of a study is extremely important; therefore, pilot testing is used to identify any possible problems in the procedures or design of the research. This also has the advantage of safeguarding the instruments of measurement that are being employed to ensure that the concepts under examination and effectively measured (Miles and Huberman, 1994; Saunders *et al*., 2003). Therefore, before the final questionnaire was circulated, an initial questionnaire was pilot tested using 20 Muslim individuals from Saudi Arabia in order to check the clarity of the questions and acquire feedback on the general feasibility of the study.

In conclusion, this section has described the philosophical beliefs underlying the study, which are positivist and objective. In addition, the most appropriate methodology to examine the research questions has been selected. The various data collection methods available have been discussed and the decision was made to use a questionnaire to collect quantitative data. The strategies to be utilized in this study include the deductive approach which applies probability sampling to examine the primary data. The relevant variables which have been selected; the independent variable will be religiosity and the dependent variables are concerning innovation propensity. In addition, a control variable will be used. This section has additionally discussed how checks are made to guarantee the reliability and validity of the study.

## 4.5. Results:

### 4.5.1. Descriptive statistics:

Tables (4.1), related to female respondents and for male respondents, set out the answers to the socio-demographic questions which were given by 319 female respondents and 321 male respondents. Age was measured by years and ranged between 15 and 75 years. Tables (4.1) demonstrate that the age mean distribution of the female subsamples around 27 years and 43 years in the meal subsample. With regards to work experience, it was measured using a continuous variable of years while the range was started from 1 to 40 years. The data shows that the mean score of the female subsample is 5.34 with SD (6.82), whilst 17.97 with SD (11.69) for the male subsample. In terms of educational background, the mean score is 5.36 for the female subsample and 5.88 for the male subsample. This data indicates that the two sub-samples respondents have a higher level of education. It shows that almost (9.09%) of the women respondents were Entrepreneurs, while 90.91% were non-entrepreneurs while (32.40%) of the men respondents were entrepreneurs, while 67.60% were non-entrepreneurs.

Moreover, table (4.1) illustrates the distribution of women participants' creativity propensity. Women respondents' creativity mean is 4.54 while the respondents' creativity mean is 4.62. In addition, the same table shows the distribution of the respondent's attitudes towards innovation for females and for males. The innovation measurement scale has a range of scores from 16 to 80, and the higher scores suggest a greater attitude towards innovation. The overall mean innovation score of the sub-sample is 3.53 for female respondents and 3.66 for males with a standard deviation of 0.52for females and 0.45 for males.

The questions to measure religiosity, illustrated by table (4.1) is enumerated on a Likert scale. As discussed above, religiosity was measured using the mean score on 30 questions range of scores from 30 to 150. The data shows that there is a strong level of Islamic religiosity for both sub-subsample, women and men. The overall mean religiosity score of the sample was 4.47for female respondents and 4.55for males with a standard deviation of 0.32 for females and 0.24for males. The mean of the normative dimension of Islam score of the sample was 4.09 for female respondents and 4.23 for males. In addition,

the mean of Cognitive dimension of Islam score of the sample was 4.93 for female respondents and 4.95 for males. The mean of the regulative dimension of Islam score of the sample was 4.84 for female respondents and 4.79 for males.

### 4.5.2. Empirical analysis:

To test the study hypotheses that gender influences the relationship between innovation propensity and Islam as one construct, two ordinary least squares (OLS) regression models were estimated. The two regression models were built to control for personal socio-demographic variables including their age, level of education, amount of work experience, entrepreneurial status and creativity, which is understood from the literature to be linked with innovation as well as with religiosity. OLS regression was followed by a *t*-test to compare the significant differences between the two sub-samples, male and female, using predicted mean values. These are described in turn in the subsequent subsection.

The binary variable gender is given a value of 1 for participants who specified in the survey that they were female and a value of 0 for males. The study hypotheses concern the impact of gender in the connection between innovation propensity and Islam. More precisely, it states that both female, ***H1a,*** and male, ***H1b,*** Islamic religiosity have a positive effect on their innovation propensity. ***H2*** the positive effect of Islam on innovation propensity is significantly greater for Muslim males comparing to their counterpart Muslim females. In other words, Muslim men will be more likely to obtain innovation propensity compared to Muslim women. To test ***H1a*** and ***H1b***, we expressed the subsequent two regression equations for the female and male subsamples:

***Female subsample: Innovation propensity = ƒ (Islamic religiosity + Controls) + Ɛ.***

***Y(Innovation) = Ɓ1χ(Female Islamic religiosity) + Ɓ2(Age) + Ɓ3(Education) + Ɓ4(Work experience) + Ɓ5(Entrepreneurs) + Ɓ6(Creativity) Ɛ.***

***Male subsample: Innovation propensity = ƒ (Islamic religiosity + Controls) + Ɛ.***

***Y(Innovation) = Ɓ1χ(Male Islamic religiosity) + Ɓ2(Age) + Ɓ3(Education) + Ɓ4(Work experience) + Ɓ5(Entrepreneurs) + Ɓ6(Creativity) Ɛ.***

Table (4.2) illustrates that positive significant relationships between innovation propensity and Islamic religiosity exist in the data for female respondents (see model 2 table 4.2) as well as male respondents (see model 8 table 4.2). However, it confirms that the relationship between innovation propensity and Islam does show a difference between the females' and males' sub-sample. Muslim males have a significant higher propensity towards innovation than Muslim females (see *t*-test table 4.3).

Table (4.2) illustrate the findings in depth, demonstrating that for Muslim females (model 2 table 4.2), the Islamic religiosity variable is positively significant with innovation propensity at the level of p< 0.01, with (0.457) coefficient confirming the first hypothesis ***H1a***. Age is negatively significant with *p*-value 0.01, work experience; entrepreneurs and creativity are positively significant with $p < 0.05$, $p < 0.1$ and $p < 0.01$ in the females' model respectively.

Furthermore, similar to model 2 table 4.2 the results for Muslim male respondents (model 8 table 4.2) show that the relationship between innovation propensity and Islamic religiosity is significantly positive with *p*-vale greater than 0.01, with (0.793) coefficient confirming the second hypothesis ***H1b***. However, as has been hypothesized, Muslim males have a significant (0.793) higher propensity towards innovation than Muslim females (0. 457). All the control variables in model (8) are statistically significant with negative *p*-value <0.05 for age, positive *p*-value < 0.1 for education, positive *p*-value < 0.05 for experience and entrepreneurs and finally positive *p*-value < 0.01 for creativity. *T*-test with mean values was calculated to analyse the differences between females' and males' sub-samples within the gender categories. Male participants were shown to have a greater relationship compared to females with ($p < 0.01$). Table (4.3) gives the details of the results for the *t*-tests. The significance for the female and male sub-samples in this study as well as the *t*-test outcomes indicate that gender is an important factor in understanding the relationship between Islam and the propensity towards innovation, specifically in the Islamic framework in Saudi Arabia. The empirical analysis of both OLS and *t*-test confirm the study hypotheses (***H1a, H1b and H2***) that Muslim males as well as females have a positive relationship with innovation propensity, and Muslim males attain more innovation propensity than Muslim females.

## 4.6. Discussion

The findings of this research illustrate that Saudi Muslim males have a higher level of religiosity than women. Which is consistent with the previous literature, including Sullins (2006) who supports the idea; although women were often more religious than men in his study, it was suggested that this phenomenon is not universal. In both of the two major world religions, Islam and Judaism, men appear to practice their religion more and be more spiritual than women (Argyle and Beit-Hallahmi, 2013). Alternatively, this argument opposes the research which used European Social Survey data to examine the differences between the religiosity of men and women. Voas (2013) discovered that females are largely more likely compared to males to be eager to be recognized as belonging to a particular religion, define themselves as believers and join in both private and public religious activities. Similarly, Stark (2002) argued that perceived low levels of males' religiosity compared to females is in fact an over generalisation which can be demonstrated both throughout the world and through history.

The results of this study demonstrate that there is a positive influence of gender on innovation propensity. This confirms the research by Ostergaard *et al*., (2011) and Wood (1987) who emphasised that gender has positive correlations with innovation propensity. Moreover, Whittington and Smith (2005) found that gender plays an essential role in producing innovation. The results also confirm that there are fewer female innovators compared to males, as well as suggesting that male-dominated occupations are likely to be more innovative, whereas those dominated by women are less innovative. In addition, these results are consistent with the "meta-analytic review of gender differences in group performance" undertaken by Wood (1987). This demonstrated that among groups of women there were fewer who could correctly solve arithmetical problems and create innovative solutions than their male counterparts. Moreover, Fasci and Valdez, 1998 and Still and Timms, 2000 confirmed that women are more likely to integrate their work or business into their family and personal aims. Therefore, women may be deterred from experimentation and innovation due to protecting their families from threats, while on the other hand, male goals are frequently focused outside the family (Marvel and Lee, 2011). Furthermore, the results of this study might support the findings of Roomi (2012) and Kantor (2002) who found that women are unlikely to be supported by their families to find

work outside their homes which leads to more limited knowledge, mobility and marketing contacts which adds further limits to innovation propensity.

The findings of this research indicate that women have less innovation compared to men which are consistent with the study of Espoito and DeLong (2001) which explained the principles created by Islam continue to limit women, specifically, the male guardianship system by which the father, son, brother or husband of a woman makes important decisions on her behalf which limits women's innovation propensity. Although Islam encourages both males and females to be well educated, the systems of education in Muslim countries restrict certain activities which limit the extent of women's attitudes towards innovation (Hamdam, 2005).

The results of this study show that Muslim men who demonstrate high levels of religiosity have high levels of innovation propensity compared to less religious men which is consistent with previous literature which studied religion and innovation, including Assouad and Parbouteeah (2018) who argued that a positive correlation exists between innovation and religion for different genders. The findings illustrated that Islamic traditions encourage positive attitudes towards innovation and Muslim women and men who have more religiosity have greater levels of innovation propensity. In addition, there is a logical explanation for how Muslim women who have high levels of religiosity can have higher innovation propensity than less religious women. Highly religious women will read the Qur'an every day because God has commanded the Messenger to read the Qur'an; God said, "recite the Qur'ân (aloud) in a slow, (pleasant tone and) style " (Surah Al-Muzzammil:4). Moreover, they will reflect on the verses of the Qur'an and the hadiths of the Messenger. Muslim women will read the verse in the Qur'an that said, "Help you one another in Al-Birr and At-Taqwa (virtue, righteousness and piety)"; Surah Al-Ma'idah:2). In addition, they read what Prophet Muhammad said: "The believers in their mutual kindness, compassion and sympathy are just like one body. When one of the limbs suffers, the whole body responds to it with wakefulness and fever" (Milla and Abdallah, 2015. p3) thus, Muslim women will build good relationships and networks, inspired by their reading, which is important for innovation (Sitkin and Weingart, 1995). Furthermore, prophet Mohammed (pbuh) said: a person who attempts to create a valuable innovation in Islam is rewarded (Al-karasneh and Saleh, 2010). Therefore, receiving the reward will encourage Muslim women

to innovate, as the reward will remove their guilt which they feel more than men and they find religion relieves their guilt (Gray, 1971; Suziedelis and Potvin, 1981) additionally because God said, ***" The good deeds remove sin "*** (Surah Hud:114. A number of studies demonstrate that religion influences innovative activities like networking positively (Maillat and Leco, 1992), and work obligation (Parboteean *et al*., 2009), both of which are central to the activities of successful innovators (Lipparini and Sobrero, 1994). However, the previous study result disagrees with some existing literature that suggests that religion is inflexible and discourages innovation propensity (Benabou *et al*., 2015) and that Islam limits the development of new ideas (Brushaber, 1991).

A surprising and unexpected result, as table (3.2) shows, was that it appeared that education has no effect on women's innovation propensity, and likewise education has no effect on the relationship between Islamic religiosity and innovation propensity, which is inconsistent with previous literature, for example, Mumford and Gustafson (1988, p.38) suggested that educational acquirement is important for innovation propensity and said "educational system that supports autonomy or builds self-esteem might increase the likelihood of innovative achievement". Equally, a significant connection exists between education and innovation (Turpin *et al.,* 2009).

The present study makes a number of contributions to the understanding of the relationship between gender, innovation and religiosity. Firstly, this study is distinguished in that it is one of the rare studies that have studied the effect of gender on the relationship between Islam and innovation propensity. Most of the previous studies show the differences between women and men in their religion and in their innovation, while this study has shown the differences between men and women in their innovation propensity in the context of the Islamic religion which makes the present study unique. This paper contributes to the few studies that have examined this triple relationship in by exploring this relationship in a religious context such as Saudi Arabia. Religious contexts generate new concepts and narratives of gender in the context of innovation and entrepreneurship. These visions can be applied in other religious contexts, which are similar to the culture and history of the Kingdom of Saudi Arabia. Secondly, using the dimensions of institutional theory (Scott, 1995, 2008), the effect of gender on the relationship between Islamic religiosity and innovation propensity is examined. This research considers the three

dimensions of Islam, whereas previous studies only examined one dimension (e.g. Benabou et al., 2015). Thirdly, the present research contributes to the existing literature on Islam, gender and innovation propensity by exploring this relationship empirically. Fourth, this paper contributed to confirming the results of some very valuable research that indicates that men are more religious than women making the results of this paper unique (Lazerwitz 1961). Most of the results of previous studies confirm that women are more religious than men (Walter and Davie, 1998; Roth and Kroll, 2007). Some scientists caution against making this phenomenon global, it lacks empirical support. Finally, this paper added new knowledge to the academic literature, as it found that other factors such as social customs are a reason for delaying women's innovation compared to men rather than Islam. Most of the previous studies mentioned other reasons for these differences, such as the lack of balance between home and work, the lack of networks, and the dislike of taking risks, while they ignored the reason related to the culture of the country. Moreover, this paper added new information to the literature related to gender differences in innovation, as it found that some religious regulation, such as financial responsibility, are a cause for these differences, and it was not mentioned as a reason these variances in the previous literature.

Although the research findings are significant to other specifications and empirical methods, there are several limitations which could be addressed by further research in the future. The participants of the survey were selected from the population of one nation, the Kingdom of Saudi Arabia, which reduces the generality of the results. Future research could extend the coverage of this study by examining more examples of Islamic countries. Moreover, it would be possible to increase the scope of this study to investigate the impact of gender on the links between innovation propensity and religiosity amid followers of Western religions, including Judaism and Christianity or Eastern religions including Buddhism as well as Hinduism.

The current research entails various implications, illustrating that education has an important correlation with innovation propensity and creates a difference in outcome is women have a different education compared to men. Therefore, educational institutions in the Kingdom of Saudi Arabia need to make education for innovation available for every level of women students from early years education up to graduate level. This implication would provide all Saudi female students with the best skills for innovation propensity. This study

showed that there exist various limitations which hinder Muslim women from accessing government services because they require a male relative to interact with male employees of the service and thus limit their innovative activity. Therefore, it is necessary to establish sections for women in government service buildings to provide for their needs.

## 4.7. Conclusion:

Previous literature discovered that women are often more expected compared to men to be keen to identify with a specific religion, describe themselves as believers and join in both private and public religious activities (Voas *et al.*, 2013). In addition, the idea of men being less religious than women is actually a generalization which is true historically and around the world (Stark, 2002). However, the idea that women are frequently more religious is not necessarily a universal phenomenon. It can be seen that in some of the major world religions, Islam and Judaism, men appear to be more religious and spiritually active than women (Schnabel, 2018; Sullins, 2006). In fact, previous literature has shown that the differences between men and women are due to several reasons. One of the central reasons was socialization. As well as differences in religion between genders, there are variations in their attitudes towards innovation. It was observed that fewer female innovators exist compared to males; additionally, primarily male occupations appear to be more innovative than those dominated by women. The existing research highlighted diverse reasons for the gender differences in innovation. This includes women often integrate their activity with their personal and family aims into those of their work.

Furthermore, the composition of female networks includes less wealthy, powerful, high-status members compared to those of male networks (McGuire, 2000). Another reason for gender differences in innovation is the unequal access to finance for women compared to men when attempting to innovate. Moreover, women remain much less likely than men to have access to wide-ranging education and training which limits women's innovation due to shortages of skills and knowledge required. Therefore, to generate a deeper knowledge, this research investigates the relationship between gender, Islamic religiosity and innovation propensity using the lens of institutional theory, including normative, cognitive and regulative aspects to demonstrate a clear, reflective understanding of these connections. Previous literature had suggested that although the normative aspect of Islam deals with males and females equally as regards worship and encourages both equally to increase their innovation propensity, limitations exist which challenge Muslim women's innovation compared to that of men (Yamani and Allen, 1996). In Islamic countries, women are not generally encouraged to work outside their house which results in a limitation of their knowledge, their mobility and their access to markets and, therefore, their innovation

propensity is limited. Thus, Muslim females are unable to create networks which are important factors for innovation propensity. Furthermore, as regards the regulative aspects of Islam, women have different financial rights and responsibilities which lead to a reduction in their ability to innovate, compared to men who have a higher level of financial responsibility compared to women. Moreover, the 'male guardianship system' by which the father, brother, son or husband of a woman makes critical decisions on behalf of the woman limits women's innovation propensity due to the lack of independence and freedom and ability to travel alone which are limiting to innovative activities. Although the cognitive dimension of Islam supports education for both genders, in certain Muslim countries, the education systems create certain limitations which reduce the opportunities for women to innovate. The results of this study were consistent with the hypotheses as it was demonstrated that Islam has a positive effect on innovation propensity in both Muslim women and men. However, men have high levels of innovation propensity when compared to women. Ultimately, previous studies such as Bénabou *et al.,* (2015) demonstrated that one vital aspect of a nation's economy is innovation and a considerable amount of academic attention has been given to this since innovation has a central role in encouraging entrepreneurship and thus economic development. Entrepreneurship is an extremely useful instrument that has been shown to help promote economic growth in developing countries and create new businesses (ACS, 2006). Audretsch and Thurik (2001) contend that entrepreneurial activities significantly reduce unemployment levels. Therefore, it is important to study this economic phenomenon to obtain a wide-ranging understanding of how Islam influences vital entrepreneurial characteristics. The following paper (P3) investigated the relationship between Islam and three important characteristics of entrepreneurship (risk-taking propensity, self-efficacy and internal locus of control).

**Table (4.1): Socio-demographic statistics**

| Variable | Female | | | | Male | | | |
|---|---|---|---|---|---|---|---|---|
| | **(N)** | **(*P*)** | **(*M*)** | ***(SD)*** | **(N)** | **(*P*)** | **(*M*)** | ***(SD)*** |
| **Control variables:** | | | | | | | | |
| Age* | 319 | 100 | 26.97 | 10.09 | 321 | 100 | 43.00 | 13.53 |
| Education | 319 | 100 | 5.36 | 1.09 | 321 | 100 | 5.88 | 0.98 |
| Experience* | 319 | 100 | 5.34 | 6.82 | 321 | 100 | 17.97 | 11.69 |
| Entrepreneurial status | 319 | 100 | | | 321 | 100 | | |
| Entrepreneurs | 29 | 9.09 | | | 104 | 32.40 | | |
| Non-Entrepreneurs | 290 | 90.91 | | | 217 | 67.60 | | |
| Creativity | 319 | 100 | 4.54 | 0.86 | 321 | 100 | 4.62 | 0.68 |
| **Dependent variable:** | | | | | | | | |
| Innovation propensity | 319 | 100 | 3.53 | 0.52 | 321 | 100 | 3.66 | 0.45 |
| **Independent variable:** | | | | | | | | |
| Islamic religiosity | 319 | 100 | 4.47 | 0.32 | 321 | 100 | 4.55 | 0.24 |
| Normative dimension | 319 | 100 | 4.09 | 0.50 | 321 | 100 | 4.23 | 0.38 |
| Cognitive dimension | 319 | 100 | 4.93 | 0.28 | 321 | 100 | 4.95 | 0.18 |
| Regulative dimension | 319 | 100 | 4.84 | 0.42 | 321 | 100 | 4.79 | 0.45 |

**N):** Observations, **(*P*):** Percent, **(*M*):** Mean, **(*SD*):** Stander Deviation
***** Years

**Table (4.2): The effect of gender on the relationship between Innovation propensity and Islamic religiosity.**

| Variables | Female | | | | | | Male | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Model (1) | Model (2) | Model (3) | Model (4) | Model (5) | Model (6) | Model (7) | Model (8) | Model (9) | Model (10) | Model (11) | Model (12) |
| **Total Islamic religiosity** | | 0.457*** | | | | | | 0.793*** | | | | |
| | | (0.0839) | | | | | | (0.0920) | | | | |
| **Normative Dimension** | | | 0.328*** | | | 0.334*** | | | 0.539*** | | | 0.541*** |
| | | | (0.0551) | | | (0.0588) | | | (0.0561) | | | (0.0569) |
| **Regulative Dimension** | | | | 0.0503 | | -0.0440 | | | | 0.0830 | | 0.0463 |
| | | | | (0.0657) | | (0.0649) | | | | (0.0534) | | (0.0481) |
| **Cognitive Dimension** | | | | | 0.167* | 0.0198 | | | | | 0.0624 | -0.114 |
| | | | | | (0.0969) | (0.0973) | | | | | (0.129) | (0.116) |
| **Age** | -0.0119*** | -0.0145*** | -0.0159*** | -0.0118*** | -0.0115*** | -0.0159*** | -0.00895** | -0.00846** | -0.00753** | -0.00925** | -0.00901** | -0.00759** |
| | (0.00386) | (0.00373) | (0.00373) | (0.00387) | (0.00386) | (0.00376) | (0.00376) | (0.00339) | (0.00332) | (0.00376) | (0.00377) | (0.00333) |
| **Education** | 0.0122 | 0.0102 | 0.0150 | 0.0117 | 0.00855 | 0.0152 | 0.0541** | 0.0440* | 0.0417* | 0.0528** | 0.0545** | 0.0402* |
| | (0.0267) | (0.0256) | (0.0253) | (0.0267) | (0.0267) | (0.0255) | (0.0252) | (0.0228) | (0.0222) | (0.0252) | (0.0253) | (0.0223) |
| **Experience** | 0.0134** | 0.0123** | 0.0121** | 0.0134** | 0.0132** | 0.0120** | 0.0107** | 0.00770** | 0.00647* | 0.0108** | 0.0108** | 0.00639* |
| | (0.00555) | (0.00531) | (0.00527) | (0.00555) | (0.00553) | (0.00528) | (0.00420) | (0.00380) | (0.00373) | (0.00419) | (0.00421) | (0.00373) |
| **Entrepreneurs** | 0.166* | 0.154* | 0.134 | 0.160 | 0.186* | 0.141 | 0.160*** | 0.112** | 0.0839* | 0.167*** | 0.160*** | 0.0864* |
| | (0.0973) | (0.0932) | (0.0925) | (0.0976) | (0.0977) | (0.0940) | (0.0525) | (0.0477) | (0.0469) | (0.0526) | (0.0526) | (0.0472) |
| **Creativity** | 0.176*** | 0.144*** | 0.141*** | 0.174*** | 0.172*** | 0.142*** | 0.209*** | 0.168*** | 0.188*** | 0.202*** | 0.205*** | 0.190*** |
| | (0.0321) | (0.0313) | (0.0310) | (0.0322) | (0.0321) | (0.0311) | (0.0352) | (0.0320) | (0.0311) | (0.0354) | (0.0360) | (0.0318) |
| **Constant** | 2.910*** | 1.097*** | 1.826*** | 2.678*** | 2.113*** | 1.915*** | 2.521*** | -0.790* | 0.451 | 2.174*** | 2.228*** | 0.785 |
| | (0.204) | (0.386) | (0.266) | (0.366) | (0.505) | (0.525) | (0.231) | (0.437) | (0.296) | (0.321) | (0.649) | (0.595) |
| **Observations** | 319 | 319 | 319 | 319 | 319 | 319 | 321 | 321 | 321 | 321 | 321 | 321 |
| **R-squared** | 0.125 | 0.201 | 0.214 | 0.127 | 0.133 | 0.216 | 0.150 | 0.312 | 0.343 | 0.156 | 0.150 | 0.346 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

**Table (4.3): Two-sample t test with equal variances**

| Group | Obs | Mean | Std. Err. | Std. Dev. | [95% Conf. Interval] | |
|---|---|---|---|---|---|---|
| Male | 321 | 3.667118 | .0118513 | .2123342 | 3.643802 | 3.690435 |
| Female | 319 | 3.539812 | .0146765 | .2621304 | 3.510937 | 3.568687 |
| combined | 640 | 3.603664 | .0097493 | .2466396 | 3.584520 | 3.622809 |
| diff | | .1273065 | .0188518 | | .0902873 | .1643256 |

diff = mean (Male) – mean (Female) t = 6.7530
Ho: diff = 0 degrees of freedom = 638

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr (T < t) = 1.0000 Pr (|T| > |t|) = 0.0000 Pr (T > t) = 0.0000

# Chapter 5 (Paper3):

## Entrepreneurial characteristics among Muslims in Saudi Arabia

## Abstract:

A notable amount of literature has recognized a link between innovation, which is one of the most important entrepreneurial characteristics, and religion. In our previous work, using the lens of institutional theory, this association was examined from an Islamic perspective. We found that Islamic religiosity has a positive effect on Muslim female and male innovation propensity on the three institution theory dimensions, normative, cognitive and regulative. The goal of this research is to examine and identify the relationship between Islam and three well-known entrepreneurial characteristics, risk-taking propensity, self-efficacy and internal locus of control. Using data collected from the Kingdom of Saudi Arabia, a sample of 640 Muslims has been used. The results of this paper showed the positive effect of Islam on all three entrepreneurial characteristics that were studied in this research.

## 5.1. Introduction:

Entrepreneurship creates increased employment and contributes considerably to economic growth (Schumpeter, 1947; Sitoula, 2015). Furthermore, entrepreneurship can overcome poverty, improve employment opportunities and promote community empowerment (Nasiru *et al.,* 2015). Research has shown that increased levels of entrepreneurship might allow a country to combat the challenges of development including unemployment and low levels of growth, by improving work opportunities through innovation (Koe *et al.,* 2014, Lee and Huang, 2018, Zvarikova and Kacerauskas, 2017).

Considerable of the previous literature has examined innovation and entrepreneurship and it has suggested that innovation and entrepreneurship are closely connected (Schumpeter, 2000; Zhao, 2000; McDaniel, 2000). Bénabou *et al.,* (2015) demonstrated that one vital aspect of a nation's economy is innovation and much academic attention has been given to this since innovation has a central role in encouraging entrepreneurship and thus economic development. Stewartet, (2003) argued that there is a strong relationship between entrepreneurs and innovation and described innovation as the single constitutive entrepreneurial function. Drucker (2014) argued that innovation is a vital part of entrepreneurship. Previous literature has described other entrepreneurial characteristics besides an innovation that determines successful entrepreneurship (Ndubisi and Iftikhar, 2012, 2010, Sahut and Peris, 2014, Tyszka and Macko, 2011).

Recently, research has identified factors that make an individual become an entrepreneur using various angles and theoretical foundations, including anthropological, social-psychological and economic. Schumpeter's, for example, observation proposes that along with an entrepreneurial environment, the formation of new enterprises depends on the availability of potential entrepreneurs or people who have suitable personalities and are in the right circumstances to form a new enterprise (Schumpeter, 2000). McClelland (1961) initiated a sequence of entrepreneurship research that examined culture and entrepreneurial potential. Although there were some elements that prompt entrepreneurship, interest continued in discovering why some individuals are motivated to start a new venture while other individuals do not (Ahmed, 1985). For example, notable empirical studies propose that values and attitudes distinguish entrepreneurs from the

general population. Furthermore, a number of academics have suggested that certain personal characteristics define the entrepreneur and motivate entrepreneurial behavior (Mueller and Thomas, 2001). Hisrich (1990) argued that an entrepreneur displays initiative and thinks creatively and organises economic and social systems to utilize resources and situations practically and accepts risk and failure.

McClelland (1961) describes a collection of defining characteristics that can be used to explain entrepreneurial behaviour, including moderate risk-taking propensity, preference for energetic activity, and taking individual accountability for successes or failure. Begley and Wagener (2010) showed that entrepreneurs (founders) recorded considerably higher compared to small enterprise managers (non-founders) in the requirement for attainment, risk-taking propensity, and acceptance of ambiguity. This study examined the psychological characteristics of entrepreneurship. It demonstrated that entrepreneurs are people with exclusive values, opinions and requirements, which distinguish them from non-entrepreneurs. Primary determinants of behaviour include an individual's beliefs, values, attitudes and drives (Koh, 1996). Murugesan (2010) proposed that individuals who demonstrate the same characteristics as entrepreneurs are more likely to perform entrepreneurial acts compared to individuals who do not possess such characteristics. Furthermore, Yusof and Jain (2007) indicate that entrepreneurs' psychological characteristics include a complete commitment to their cause, the requirement of total control, view what is right from a utilitarian standpoint, accept uncertainty and enjoy a challenge.

Othman (2005) reported that numerous studies of entrepreneurial characteristics have been undertaken over the years. Thus, to analyse the entrepreneurial process Ferreira, *et al.,* (2012) utilised a model that includes internal locus of control and risk-taking propensity as "determinants of entrepreneurial intention. Abdelrahim (2007) described innovativeness, self-efficiency and control as being essential entrepreneurial attitudes. Bruyat and Julien (2001) argued that a focus on the surrounding environment is required to gain an understanding of entrepreneurial characteristics.

However, although the available literature has studied the relationship between entrepreneurs and psychological characteristics, less research has focused on how religion

can shape this relationship. Therefore, this research examines the effects of Islam on three entrepreneurial characteristics; risk-taking propensity, self-efficacy and internal locus of control, and investigates how can Islam shape the variation between entrepreneurs and non-entrepreneurs in these characteristics amongst Saudis. In addition, the goal of this research is to provide comprehensive knowledge of the relationship between Islam and entrepreneurial characteristics**.** The main study question is what is the relationship between Islam and entrepreneurial characteristics in Saudi Arabia. Four sub-questions were developed during the study: (1) what is the relationship between Islam and risk-taking? (2) How can Islam impact self-efficacy? (3) How can Islam effect internal locus of control? and (4) what are the variances between entrepreneurs and non-entrepreneurs in these characteristics amongst Saudis. In fact, the reason for choosing this topic is to encourage the entrepreneurial characteristics of people in the Kingdom of Saudi Arabia and investigate how Islam shapes these entrepreneurial characteristics. As has been cited heavily in the literature that entrepreneurship is one of the important factors that help drive the economy. The data of this study was collected from Saudi Arabia and according to Bruyat and Julien (2001), a focus on the surrounding environment is required to gain an understanding of entrepreneurial characteristics. Thus, a clear description of entrepreneurship in the Kingdom of Saudi Arabia is given. (please see section 4.2.2).

This paper is organized in a methodical manner to contain seven sections. Section 1, is an introduction to the third paper which includes an overview of the study and its aims and questions to be addressed, resulting in various objectives. Furthermore, in section 2, the available literature is discussed with a focus on the gaps where issues are not addressed. This is followed by section 3, which explains the methodology utilized in this research. In section 4, the data analysis is discussed as well as the empirical results and how the research hypotheses were tested. Subsequently, in section 5, there is a discussion of the findings of the research, which are linked to the literature review. Finally, section 6 presents the conclusions of the study and summarizes the principal limitations, contributions and recommendations of the researcher and suggestions for future studies. The following section will critically discuss the existing literature on the relationship between entrepreneurs and three psychological characteristics, risk-taking, self-efficacy and internal

locus of control, followed by exploring how Islam might affect these entrepreneurial characteristics.

## 5.2. Literature review:

### 5.2.1. Entrepreneurship:

Entrepreneurship and entrepreneur are discussed by academics in various disciplines, including economics, psychology, sociology, business and management (Hébert and Link, 1989). Entrepreneurship is considered as a multi-dimensional and interdisciplinary phenomenon (Dopfer *et al.,* 2004). The literature on entrepreneurship has identified a broad range of entrepreneurship determinants. The economic studies, for example, have focused on the impact of the entrepreneurship on economy (Acs and Szerb, 2007), where sociological research has concentrated on the shared background of entrepreneurs and the role of culture (Hofstede *et al.,* 2004) including social values (Tlaiss, 2015), and religious beliefs (Dana, 2021) that influence individual behaviour in a society. Morrison (1998, pp.27-49) suggested that "entrepreneurship, in essence, involves the process of creating value by bringing together a unique package of resources to create or exploit a market opportunity". Schumpeter (2000) argued that innovation is the essence of entrepreneurship. The importance of entrepreneurship, as both the formation of value and the utilization of markets are documented. Hébert and Link (1989, p.47) reviewed the entrepreneurship literature and proposed the following definition of entrepreneurs: "The entrepreneur is someone who specializes in taking responsibility for and making judgmental decisions that affect the location, form, and the use of goods, resources, or institution.". Recently, the field of entrepreneurship had already been created and a significant scientific community communicates their research on the subject through various meetings and scientific periodicals (Bull and Willard, 1993a). Academic courses in entrepreneurship now exist for undergraduates and graduates in many business schools. Courses studying entrepreneurship are currently offered by many universities, and endowments are widely available to teach this vital subject to future representatives of business (Streeter and Hovis, 2002.).

Furthermore, Lumpkin *et al.,* (2013) argue that entrepreneurship is a person who takes risks or an inventive venture into a new enterprise or someone who recovers an existing business. This definition highlights some main themes and activities of entrepreneurs who act in forthcoming decisions such as innovation, risk-taking, uncertainty and some other entrepreneurial behaviours. Wang (2008) affirms that Entrepreneurial

Orientation theory (EO) has received considerable attention, theoretically and empirically, in entrepreneurship research. Lumpkin and Dess (1996 p: 136) stated that "Five dimensions-autonomy, innovativeness, risk-taking, proactiveness, and competitive aggressiveness have been useful for characterizing and distinguishing key entrepreneurial processes, that is, a firm's Entrepreneurial Orientation (EO).

On the other hand, a different view of entrepreneurship examines the behaviour of individuals, which it is an important aspect of this phenomenon (Jones and Coviello, 2005). Entrepreneurial behaviour occurs in various organizational contexts, including small to medium-sized businesses as well as large companies, in a spectrum that ranges from new start-ups to reputable, traditional businesses, in addition to non-profit organizations or even government agencies (Gartner and Reynolds, 2010). Behaviour of entrepreneurs is commonly connected to the Schumpeterian idea of entrepreneurs which has two principal factors describing entrepreneurial behaviour. Firstly, there is the capacity to either distinguish an opportunity or the capability to generate an innovative opportunity (Alvarez et al., 2010). Secondly, there is an component to entrepreneurial behaviour which includes either exploiting or commercialising this opportunity. When combined, these basic entrepreneurial behaviours can be utilized to discover or create a new opportunity. The behavioural school of thought concerning entrepreneurship promotes an understanding of the opportunities that exist and illustrates how those opportunities are pursued (Audretsch, 2012). Furthermore, the more recent observations of entrepreneurship have concentrated on the cognitive prodedure that individuals follow in order to reach a decision. Sarasvanthy *et al.,* (2003), p. 142) observed that “An entrepreneurial opportunity consists of a set of ideas, beliefs and actions that enable the creation of future goods and services in the absence of current markets for them”. Moreover, to answer the questions concerning why some entrepreneurs operate differently from others, some academics have investigated the differences between individuals (Stevenson and Jarillo, 2007). It was observed by Krueger (2003, p. 105) that “The heart of entrepreneurship is an orientation toward seeing opportunities,” which resulted in the question, “What is the nature of entrepreneurial thinking and What cognitive phenomena are associated with seeing and acting on opportunities?”. Following on from this, Shane and Eckhardt (2003, p. 187) presented the individual opportunity and explained that “We discussed the process of opportunity

discovery and explained why some actors are more likely to discover a given opportunity than others." The differences they discovered included a preference for autonomy and independence, the inclination to accept risk, access to resources such as financial capital, a well-educated workforce and pragmatic abilities (Audretsch, 2012).

Nevertheless, Sexton (1988, p. 4) asked a question that remains important: "Is the field of entrepreneurship growing, or just getting bigger?". There continues to be a difficulty with the definition of "entrepreneur" and additionally with creating a definition that gives an idea of the boundaries of the entrepreneurial arena (Knopik, 2006). Gardner (1990, p.16) asked, "Is entrepreneurship just a buzzword, or does it have particular characteristics that can be identified and studied?". It was suggested by Bygrave and Hofer (1992, p.15) that "Good science has to begin with good definitions". The foundations of the predominant view of the entrepreneur were laid down by Cantillon, Turgot, Say and Schumpeter, who recognised that although entrepreneurship is extremely important for modern economies and number of researchers world have examined it, there was no clear agreement about how to define the objects of research (Knopik, 2006).

Previous literature has investigated entrepreneurship and showing that this phenomenon is much more multifaceted than was first considered in the past. Therefore, ongoing theories have been established in order to produce improved tools to utilise in practical research, thereby advancing our knowledge and generate even more valuable empirical studies. A definition that creates a constructivist stance which is able to understand or even forecast the failure or success of an entrepreneurial undertaking improves the comprehension of which environmental conditions encourage the activities of entrepreneurs (Bruyat, 2001). Therefore, the processing of the data for this study, which was collected from Saudi Arabia, requires a clear understanding of entrepreneurship in the Kingdom.

### 5.2.2. Entrepreneurship from an Islamic perspective:

The Qur'an and Sunnah are the main foundations of Islam. The Qur'an consists of God's words and the Sunnah is Prophet Mohammed's (pbuh) deeds, sayings and tacit approvals. When Muslims are unable to find direct guidance from the Qur'an, they use secondary sources, known as Ijma (Consensus) from religious scholars and Qiya's (Analogy)

with the intention to create analogies to a decision that has been previously accepted by religious scholars thus constituting the secondary sources of Sharia. These pillars and sources of Islam shape all aspects of Muslim's lives, from spiritual affairs to materialistic one.

Islam is a lifestyle rather than merely being a religion (Kamrudin, 2020, Tlaiss, 2015). Similar to other religions, Islam maintains the sanctity of life and Islamic principles acknowledge self-dignity in that it declares all people are entitled to practice their own beliefs in the society that they live in. Thus, Islam allows individuals to have property, trade, augment their prosperity and become involved in whichever economic activities are not forbidden by Sharia. God Almighty in the Holy Qur'an says in Surah Al-Taubah, "***And say (O Muhammad) "Do deeds! God will see your deeds and (so will) His Messenger and the believers."*** [Al-Taubah 9:105] and in Surah Al-Ankkabut, ***"… so [Muslims] seek your provision from God."*** [Al-Ankabut 29-17]. Furthermore, in Surah AL-Jumu'ah: ***"Then when the [Jumu'ah] Salat (prayer) is finished, you may disperse through the land and seek the Bounty of God"*** [Al-Jumu'ah 62: 10]. In the Islamic world, businesses seeking to make a living (Rizq) are seen as being a vital part of life. In these verses, Muslims are advised by God Almighty to participate in economic activities and gain a living through employment or self-employment. Numerous empirical researchers have emphasised that Islam supports entrepreneurial developments ( Audretsch *et al.,* 2013, Tlaiss, 2013; Gümüsay, 2014; Hassan and Hippler III, 2014). In addition, Sharia gives Islamic people abundant business ethics, while their values encourage economic growth. Thus, the literature concludes that the firm foundations of Islam support the involvement of Muslims in both entrepreneurship and a wide range of economic activities (Beekun and Badawi, 2005).

However, this argument is not without opponents. Kuran (2012) claims that the elements underpinning the comparative economic underachievement of Muslim nations might include inefficient institutions and a shortage of entrepreneurial qualities. Hassan and Hippler (2014) argue that Muslim entrepreneurs are obliged through religious principles to refrain from taking part in specific economic activities, including usury and gambling. Western entrepreneurs might decide to relinquish particular enterprise opportunities because of religious beliefs. However, these restrictions are from choice and are generally less limiting compared to those of Islam.

Using a positive example from one of the Islamic countries, Saudi Arabia, which is one of the most important countries that implies Islamic principles in all aspects of life (Bowen, 2014), has made steps to decentralise the economy and as a result of this implementation the entrepreneurial spirit has begun to take shape within the Kingdom. Entrepreneurship In Saudi Arabia is considered as one of the main elements contributing to the stable and swift development of its economy (Akinwale and George, 2020). Furthermore, entrepreneurship mainly contributes to appropriate utilisation of resources, creation of an advanced independent society, and the establishment of employment chances in the country (Hamod, 2010). Historically, entrepreneurship was seldom undertaken in Saudi Arabia because of the unfavourable climate and the shortage of entrepreneurial ability of the inhabitants (Yusuf and Albanawi, 2016). The Global Entrepreneurship Mentoring report of 2020 demonstrated that considerable progress has been achieved by the country. There is now a national framework for entrepreneurship in Saudi Arabia called Vision 2030 and the aim is to join the top 20 of 54 countries which is similar to Germany and the United Kingdom; the country is aiming to become an economy that supports entrepreneurship (GEM, 2020). The aims of Saudi Vision 2030 focus on developing the contribution of small and medium-sized companies, increasing them from 20% to 35% of the economy and lowering the level of unemployment (Alamoudi and Bagaaifar, 2017). To accomplish the aims of extensive economic development, SME specialist Monsha'at was created in 2016 to inspire fledgling entrepreneurs to start up their own enterprises by gaining access to individual funding. However, the amount of development of entrepreneurship in Saudi Arabia continues to be limited (Ceptureanu and Ceptureanu, 2015; Mehtap *et al.,* 2017).

Fallatah (2020) argues that the legal regulations and processes for creating an enterprise in Saudi Arabia are inadequate and the efficiency of present laws fails to provide satisfactory defense of entrepreneurs' rights. Furthermore, oil rents allowed entrepreneurial activities in Saudi Arabia to be limited, thus preventing the country from evolving a productive and sustainable business sector generating national income (Ansari, 2017). Kayed and Hassan (2011) argued that oil wealth prevented the development of entrepreneurial qualities among many potential Saudi entrepreneurs, which prevented the emergence of new enterprises. Moreover, Hassan and Hippler (2014) argue that Muslim entrepreneurs are obliged through religious principles to refrain from involvement in

specific economic activities, including speculation, gambling and usury. It is possible for Western entrepreneurs to sacrifice specific business chances because of religious laws but such restrictions are through choice and may be less obstructive compared to Islamic laws. Therefore, it has become necessary to study the impact of Islam on the entrepreneurial characteristics of entrepreneurs, considering that Islam is the religion that is central to all parts of life in the Kingdom of Saudi Arabia.

Nevertheless, studies into entrepreneurship investigate the connections between an individual and the formation of a new value happening through a continuous process within a specific environment which has characteristics that can be described (York and Venkataraman 2010). It is important that the individual, the project, the environment and the relationship between these elements is observed in order to understand the entrepreneurship phenomena. It can be understandable that entrepreneurs are not like machines responding to a situation automatically but are a human capable of developing new skills, creating different ideas and manipulating the local environment (Bruyat and Julien, 2001). Several psychological aspects which are essential in defining the success of entrepreneurs have been highlighted by previous literature (Vereshchagina and Hopenhayn 2009; Mueller and Thomas, 2001; Markman and Balkin, 2005). Therefore, the following section will shed some light on the previous literature that examined the most important entrepreneurial characteristics of entrepreneurs.

### 5.2.3. Perspectives to entrepreneurship and Entrepreneurs

Entrepreneurship has become a much more visible phenomenon than it has been over the past hundred years. It has many perspectives and more comprehensive and expanded concepts (Gartner and Shane 1995). The results of current studies indicate that entrepreneurship is a purposeful concept and a career life for many individuals, as approximately 1 out of every 25 people attempts to start their own projects or companies. Therefore, entrepreneurship affects not only individuals but also the growth and prosperity of societies (Reynolds and White 1997, p. 7). Thornton **(**1999, p**.**19) stated that " Along with the increase in entrepreneurship has come growth in the number of endowed chairs in business schools; positions in research institutions, foundations, professional organizations; and journals in the field of entrepreneurship". This indicates that society and governments have become fully aware of the importance of entrepreneurship at the level of individuals

and at the level of society as well as on the economic level of the country. Bull & Willard (1993) argue that despite these growths in the field of entrepreneurship that the world is witnessing at this time, researchers in this field indicated that there is no consensus among entrepreneurship scholars on a special and distinct definition of entrepreneurship. They criticized the absence of an identity that distinguishes and defines entrepreneurship, an identity that can define entrepreneurship based on social sciences with all its theories (Bull & Willard 1993). Many studies have emphasized the importance of social sciences as well as social psychology for the development and prosperity of entrepreneurship) Turkina, and Thai 2015; Bandura 1997, 1986)

The methodologies of social psychology are considered convenient for the study of entrepreneurship and its characteristics as the nature of entrepreneurship tends to be a social phenomenon (Fredin, 2017). The reason entrepreneurship is a social phenomenon is that it arises in a society and interacts with the surrounding circumstances and is influenced by its owners**.** Entrepreneurship often starts with the realization of chance which can be classified as a social perceptual act then the interactions with others are organized and crown the end with a successful project based on the foundations and principles of the project owner (Shaver 2010). Hence, the strong relationship between society and individuals appears where individuals realize the opportunity and the society organizes the appropriate entrepreneurial environment (Turkina and Thai, 2015)**.** The relationship between society and the individual in the context of entrepreneurship is clearly evident through the concept of psychological and social entrepreneurship motives. Turkina and Thai (2015) argue that there are two types of entrepreneurial motives, which are psychological and social motives**.** The first type deals with theories of self-efficacy at individual level (Bandura 1997, 1986), while the second one is concerned with the theory of social legitimacy at the level of society**.** Self-efficacy can be defined as the individual's belief and absolute confidence that he is able to complete a specific task to the fullest (Sherer *et al.,* 1982). Pursuant to the theory of self-efficacy, individuals perform in a society according to their sense of what they can do and achieve**.** They also act according to what they think of the possible consequences; as Bandura noted “there are many attractive activities, which, if done well, guarantee cherished outcomes, but they are not pursued by persons who doubt they can do what is needed to succeed” (Bandura 1986, p. 231). Ajzen (1996, 1991) stressed the

importance of the desire for entrepreneurship, as he believes that if the desire is not present in the person, entrepreneurship will be difficult to carry out even if the entrepreneurial project is possible. Regarding the theory of social legitimacy, it provides a deeper insight than the entrepreneurial desire, through the general influence of institutions and social culture appropriate to the entrepreneurial activities. Scott (1995) emphasizes that the knowledge structures and values of society determine the institutional environment that guides and liberates the economic practices in a particular country. Thus, psychological and social factors define economic activities and their reward, as well as classifies risks and circumstances under which entrepreneurs can enjoy social and economic legitimacy (North 1990). Previous studies have proven that social and cognitive factors have an effective role in the success and expansion of the entrepreneur. Moreover, they are the main reason for creating entrepreneurs's wealth which then creates the wealth of their societies (Baron, 2000). In addition, psychological factors have a distinct role in influencing the success of the entrepreneur. The successful entrepreneur always thinks differently from others and shows absolute confidence in his implementation of innovative or entrepreneurial ideas (Izquierdo and Buelens 2011).

In the words of Schumpeter, "An entrepreneur is a person who is willing and able to convert a new idea and invention into a successful innovation" (Shastri and Sinha, 2010. P 30). Continuing on from this, Anderson (2015) referred to the assertion of Schumpeter that the entrepreneur accomplishes the innovations that allow the liberal system to persevere by continuing beyond its contradictions. Bruyatand (2001) proposed that an entrepreneur can be described as being a person who takes risks and therefore can justifiably earn any profits from the resulting activity. Alternatively, Pelletier (1990) suggests that entrepreneurs can be categorised apart from other risk-taking capitalists as they both organise people and product creation in order to create value.

Currently, there are two main trends that oppose each other within the scientific sphere concerning entrepreneurship (Baumol, 1993). Initially, there is the area resulting from the research of Turgot and Say, which sees the entrepreneur as being the individual who generates and advances a new endeavour. The alternative viewpoint follows Cantillon and Schumpeter who contend that an entrepreneur is a special individual who innovates and alters the economy in new, exciting ways.

Schumpeter did not claim to have created the final definition of the word 'entrepreneur'; however, he defines it in such a way as to allow him to approach the issues theoretically in order to reveal the ways in which the capitalist system is able to continue despite its contradictions using a creation/destruction dynamic (McDaniel, 2005). He utilised a functionalist approach towards his investigation of the entrepreneur, demonstrating that entrepreneurs are people who reform the system of production, continuing as entrepreneurs only as long as this function is their primary one (Bruyat and Julien, 2001)

Furthermore, a crucial role has been undertaken by entrepreneurs in guaranteeing the success of small to medium enterprises. Entrepreneurs have original characteristics which are referred to as demographic, individual and personal traits, orientations and entrepreneurial readiness. Previous studies have discovered that demographic factors including gender, age, educational background and previous work experience have an important impact on the aims and efforts of entrepreneurs (Vereshchagina and Hopenhayn 2009; Mueller and Thomas, 2001; Markman and Balkin 2005).

Hessels *et al.,* (2008) showed that people aged from 25 to 44 years tended to be most active entrepreneurially. A study in India undertaken by Kautonen, (2008) suggested that successful entrepreneurs were usually younger than the general population. People over the age of 25 were more successful than those who were younger. It was demonstrated by Minniti and Arenius (2003) that women were less likely to found new commercial enterprises than men. Correspondingly, a study showed that people with previous experience in entrepreneurship had significantly greater ambitions than those who lacked that experience. However, people who had previously been employed by the government were less likely to succeed in creating their own small businesses (Indarti, 2004). Islam *et al.,* (2011) found that innovative small firms and discovered that the leaders of successful companies had frequently been brought up by entrepreneurial family to have a wide-ranging experience of business and to have experienced starting new ventures previously.

According to Vereshchagina and Hopenhayn (2009), Mueller and Thomas (2001), Markman and Balkin (2005), a range of personal qualities are connected to successful entrepreneurs, including innovativeness, risk-taking, self-efficacy and internal locus of control and chosen since they have been frequently mentioned in various studies into entrepreneurship. Moreover, these characteristics can represent the entrepreneurial

behaviour of individuals (Gürol and Atsan, 2006). The research of Stewart and Roth (2001) found that when measures of risk propensity were utilized, a variance between entrepreneurs and non-entrepreneurs was discovered. Moreover, Markman and Balkin (2005) found that entrepreneurs scored considerably higher for self-efficacy, apparent control over misfortune and apparent responsibility for the result of misfortune compared to non-entrepreneurs. Koh (1996) demonstrated higher rates of internal locus of control for entrepreneurs compared to non-entrepreneurs.

Gürol and Atsan (2006) noted that although previous literature showed that entrepreneurs could be distinguished from other individuals by personality characteristics such as risk-taking and locus of control, their study found no differences. Furthermore, Chen and Crick (1998) discovered that existing studies into the psychology of entrepreneurs showed that personality characteristics, including locus of control, could not differentiate between entrepreneurs and managers. However, given that these two variables are only a small part of the personality characteristics which may show the difference between entrepreneurs and managers, the study was not a complete test of potential personality factors. However, the overall findings of study into entrepreneurial features are still questionable as research both supports and refutes the relationship between characteristics. It is thought that methodological, conceptual and definitional complexities are the reasons behind these deviations (Stewart *et al.,* 1998). Thus, it is still possible to investigate the relationship between entrepreneurs and some psychological characteristics.

### 5.2.4. Risk-Taking and Entrepreneurs:

Some psychological factors that are important in defining the success of entrepreneurs have been highlighted by previous literature (Vereshchagina and Hopenhayn 2009; Mueller and Thomas, 2001; Markman and Balkin 2005). In particular, the propensity for risk-taking has been examined frequently in entrepreneurial research (Stewart and Roth, 2001). Much of the previous literature illustrates the strong links between entrepreneurs and risk-taking propensity. Risk-taking can be described as coping with uncertainty and having an amount of enthusiasm to deal with it (Tubbs and Flum, 2006). In his Third New International Dictionary, Webster (1961) stated that an entrepreneur is "the organizer of an economic venture, especially one who organizes, owns, manages, and assumes the risk of a business" (Holtzhausen and Naidoo, 2016 p. 94). Similarly, Funk and Wagnair's Standard

Dictionary (1958) defines an entrepreneur as "one who undertakes to start and conduct an enterprise or business, assuming full control and risks (Voll, 2008 p.12). Moreover, the research of Stewart and Roth (2001) found that when measures of risk propensity were utilized, entrepreneurs differed from non-entrepreneurs. In addition, other research established the theory that entrepreneurs feel more confident towards risk than non-entrepreneurs (Lago and Branco, 2018; Gürol and Atsan, 2006). Macko and Tyszka (2009) argue that, although entrepreneurs take more risks than other individuals, it is exclusively in risky situations that are skill-related rather than in those which are chance-related. The propensity of entrepreneurs to take risks could also be connected to the perception of risks. During the estimation of the risks in a situation, the individual who is making decisions creates certain beliefs concerning possible outcomes. The perception of the amount of risk in a particular situation will be founded on previous experience. Brockhaus (1980) argued that risk-taking and entrepreneurs are linked because in becoming an entrepreneur, a person risks their health and psychic well-being, their family relations, career opportunities and their financial well-being. It is possible that the personal financial responsibilities which an entrepreneur makes to a failing initiative can result in major personal losses, which may lower her/his future living standards.

Furthermore, Liles (1974) argued that as it is likely that the entrepreneur will have dedicated himself personally to the venture, its failure seems like a personal failure that may have huge consequences emotionally. Given that both the emotional and the financial consequences of a failed venture can be overwhelming, Liles argued that a potential entrepreneur is recommended to cautiously analyse the risks specifically connected to his venture. Other studies utilised comparable measures of risk propensity and discovered a difference between entrepreneurs and non-entrepreneurs. Some examples of this argument are the studies of Begley and Boyd (1987), Carland *et al.,* (1995) and by Stewart *et al.,* (1999), which all utilised Jackson's questionnaire, and which agreed with the theory that entrepreneurs take more risks compared to non-entrepreneurs. Vereshchagina and Hopenhayn (2009) demonstrated that several arguments have been suggested to explain why individuals become entrepreneurs and they all depend on the notion that entrepreneurs have a particular selection of preferences, including tolerance of risk and an

optimistic outlook. Particularly wealthy entrepreneurs were found to invest in less risky ventures, whereas entrepreneurs who are less wealthy decide to take more risks.

However, the Kogan-Wallach survey was utilised to quantify the risk-taking of three groups including newly promoted managers, recently hired managers and entrepreneurs and no differences were found between the groups (Macko and Tyszka, 2009). In addition, Richard (1989) applied Jackson's survey which consists of ten true or false statements concerning various areas of risk including financial, ethical and social, he discovered no differences between non-entrepreneurs and entrepreneurs as regards risk-taking. Therefore, the research arguments mentioned above are not conclusive on this whether entrepreneurs take more risks compared to non-entrepreneurs or vice versa.

### 5.2.5. Internal locus of control and entrepreneurs:

In the field of psychology, there has been a considerable tradition of studies into perceived control and how it relates to human behaviour (Strickland, 1989). Rotter (1966) defined internal locus of control as a person's perception of events depending on that individual's own actions or characteristics. On the other hand, external locus of control is an individual's feeling about a result being completely separate from that individual's activities, for example, being due to chance, luck, other powerful people or fate (Salamzadeh, 2014). Rotter (1966) who developed a "locus of control" construct, arguing that a person understands the consequences of an occurrence as existing either beyond his or her control or understanding or within it (Ogunmakin and Akomolafe, 2013). According to Rotter (1966), an "internal" individual believes that ability, skills or effort can influence outcomes, whereas "external" individuals feel that elements beyond their control influence outcomes.

Notable literature has shown a positive connection of Internal Locus of Control to becoming an entrepreneur (Khan *et al.,* 2014, Asanteand, 2019, Gürol and Atsan, 2006). It was suggested by Brockhaus and Horwitz (1986) that it is possible to distinguish successful entrepreneurs from those who are unsuccessful using locus of control. Normally, it is thought that entrepreneurs have a preference for taking complete control of a situation rather than relying on external factors. Furthermore, there is agreement that an entrepreneur is an individual who is self-motivated and initiates and builds a venture depending on themselves instead of other people to define and implement their aims.

Various personal qualities, including self-reliance, initiative, self-confidence control and resourcefulness, have been mentioned as being closely related to entrepreneurial behaviour and values (Mueller and Thomas, 2001). Asanteand (2019) demonstrated that the association between an internal locus of control positioning and entrepreneurial behaviour has considerable validity.

A notable body of research argues that internal locus of control is a characteristic of entrepreneurs. For example, Ho and Koh (1992) found in a study about the differences in psychological characteristics between non-entrepreneurial and entrepreneurial motivated graduates that internal locus of control is an entrepreneurial attribute. Xiang (2007) found that entrepreneurs are initiators and are responsible for their own well-being rather than depending on other people. Additionally, if an individual lacks a belief that business outcomes can be affected by personal exertion, then they are unlikely to take the risk of being exposed to the major penalties connected with failure (Mueller, 2002). A study of 282 undergraduate business students at a public university in Saudi Arabia confirmed that internal locus of control influences entrepreneurial intentions (Naushad and Malik, 2018). Another study demonstrates that social workers who were entrepreneurial revealed considerable internal locus of control compared to most people (Mishra, 2015). Brockhaus and Horowitz (1986) in their study found that prospective entrepreneurs would be expected to have an internal locus of control rather than an external one.

Moreover, an internal locus of control can be considered a prerequisite for a new venture initiation process. Krueger and Carsrud (2000) believed that propensity to act is a vital part of the process of initiating a new enterprise. The propensity to act on a new opportunity may be influenced by an individual's perception of control. Krueger contend that a person who believes an entrepreneurial chance is equally feasible and beneficial might not start an original project except if they are psychologically predisposed to act on their decision. Therefore, an internal locus of control outlook makes it more likely that a potential entrepreneur will complete their plans (Mueller and Thomas, 2001).

In contrast, although numerous empirical studies demonstrate the Differences between entrepreneurs and non-entrepreneurs in internal locus of control, there were mixed results shown by researchers (Ahmed 1985; Brockhaus 1980). For example, Chen and Crick (1998) found that some studies on entrepreneur psychology indicated that some

personality characteristics including locus of control could not differentiate between entrepreneurs and managers. Brockhaus and Nord (1979) found that despite previous literature showing that personality characteristics including risk-taking and locus of control distinguishing entrepreneurs from other people, their study showed no differences.

It is possible to explain the inconclusive results by noting that Rotter's measure is multi-dimensional and some of its dimensions are less credible predictors of entrepreneurial behaviour than others (Mueller, 2001). Nonetheless, empirical research utilizing multi-dimensional measures of locus of control have tended to agree that entrepreneurs are more internal than non-entrepreneurs (Ahmed 1985). The study of Bonnett and Furnham (1991) utilized an economic locus of control scale with three-dimensions, utilising internal, external and chance factors and showed that a group of student entrepreneurs were more internal compared to a control group (Wright and Rotten, 2000).

### 5.2.6. Self-efficacy and entrepreneurs:

An individual's belief that they can fulfill roles and accomplish tasks is referred to as self-efficacy and it is closely related to motivation, goals and expectations (Bandura, 2001). One major feature of self-efficacy is its level of specificity. Self-efficacy similarly can be general and refer to confidence about all and any responsibilities (Sherer *et al.,* 1982). Alternatively, Sherer, at the narrowest level, refers self-efficacy to an individual belief in successfully completing a single, specific task. Hayward *et al.,* (2006) defined overconfidence as happening when people overestimate the accuracy of their forecasts or, more generally, when they are excessively confident about their beliefs, abilities and knowledge. In addition, self-efficacy has an effect on the amount of stress an individual experiences when dealing with difficult circumstances and the level of achievement gained by individuals. Self-efficacy impacts an individual's amount of effort, courses of action and response to failure and influences whether an individual's thinking is positive or negative (Bandura, 1999; Wood and Bandura, 1989).

Individuals who have a high propensity for overconfidence about their entrepreneurial capacity are likely to have greater levels of self-efficacy than others regardless of actual ability. Izquierdo and Buelens (2011) argued that self-efficacy is one of the main requisites of a possible entrepreneur. Cassar and Friedman (2009) suggested that

given the entrepreneurial arena is characterized by risk-taking and uncertainty where personal beliefs are more prevalent in the decision-making process; people believe that entrepreneurs have greater self-efficacy compared to non-entrepreneurs. People who believe they are effective in accomplishing entrepreneurial tasks and roles have a greater likelihood of entering the entrepreneurial climate compared to individuals who do not (Chen and Crick, 1998). Gist and Mitchell (1992) suggested that entrepreneurs who make discoveries that lead to patents require high self-efficacy as such an undertaking is inhibited by funding, time constraints, technological obstacles and uncertain outcomes. In addition, innovations are being challenged and even contested before they eventually gain patent position making strong self-belief essential (Markman and Balkin, 2005). Activities are often based on what individuals believe they can achieve than on what is factually true; thus, self-efficacy is a good forecaster of entrepreneurial achievement. Individuals with high levels of self-efficacy are more likely to connect challenging conditions with gains including community recognition, income and psychological fulfilment (Lebusa, 2011). Moreover, entrepreneurs who work in a challenging environment and face financial and technological problems and legal liabilities and uncertainties have a high level of self-efficacy. In contrast, Inventors occupied as employees have a more secure working environment (Chen *et al.,* 1998). Furthermore, research shows that individuals with high self-efficacy perform better in difficult situations (Bandura, 1997). Self-efficacy is related to achievement and action intentionality and can be utilized to investigate the persistence and effectiveness of entrepreneurs and their decisions about how to behave (Bird, 1988; Boyd and Vozikis, 1994).

An important constituent of the intentional models is the principle of entrepreneurial self-efficacy, which is about the positivity of an individual's belief in their capacity to successfully take on the tasks and role of an entrepreneur (Boyd and Vozikis, 1994, Schere *et al.,* 1989). Entrepreneurial self-efficacy was described as “an important explanatory variable in determining both the strength of entrepreneurial intentions and the likelihood that those intentions will result in entrepreneurial actions” (Prasetio, 2016, p. 3). Brockhaus (1980) argued that since entrepreneurs have a strong belief in their capacity to achieve their enterprise aims, they expect a small chance of failure. Alternatively, individuals with low levels of self-efficacy expect failures like bankruptcy, psychological stress and disgrace.

Furthermore, Chen *et al.,* (1998) requested that entrepreneurs and managers describe their self-assurance in carrying out a number of tasks required to run a business and found that for a number of the tasks entrepreneurs had a greater feeling of self-efficacy compared to non-entrepreneurs. In addition, Macko and Tyska (2009) demonstrated that entrepreneurs exhibited a greater level of self-efficacy compared to non-entrepreneurs. Another study compared Irish entrepreneurs and Irish managers and found that the mean total self-efficacy score of entrepreneurs was significantly higher than the manager's score (Keane *et al.,* 2018). A study of Saudi undergraduates confirmed that self-efficacy and various psychological variables were important in enhancing entrepreneurial intention (Naushad and Malik, 2018). The psychological variables were not sufficient to create entrepreneurial intention unless they were combined with self-efficacy. Basaffar and Basaffar (2018) utilised Kreuger and Brazeal's Model of Entrepreneurial Potential to examine Saudi entrepreneur's perceived self-efficacy. Basaffar and Basaffar found that all of the entrepreneurs interviewed in the study demonstrated perceived self-efficacy.

The effort in considerable of the research in entrepreneurship focuses on personal characteristics which distinguish entrepreneurs from other people (Low and MacMillan, 1998). Examples include risk-taking propensity, internal locus of control and self-efficacy, have been identified and investigated as potential traits linked with entrepreneurial behaviour (Boyd and Vozikis, 1994). Most of these investigations have assumed that entrepreneurs exhibit unique characteristics that can be isolated and examined (Gürol and Atsan, 2006). However, some studies have suggested that these factors are not unique to entrepreneurs but are common to other successful individuals (Masese, 2004; Ogunsade 2017; Nandram and Samsom, 2007). Consequently, this study shed some light on this continues argument by examining the influence of religion on such characteristics.

## 5.3. Conceptual framework and hypotheses development:

Several studies have discussed the relationship between psychological characteristics and entrepreneurs, including Ahmed (1985), Lebusa (2011), Mishra (2015), Keane (2018). Nevertheless, there is a lack of research that studies the influence of religion on entrepreneurial characteristics including risk-taking, self-efficacy and internal locus of control. Therefore, this research examines the links between the religion Islam and number of entrepreneurial characteristics and how can Islam shape the variation between entrepreneurs and non-entrepreneurs in these entrepreneurial characteristics. The following section explores links between Islam and the characteristics of entrepreneurship to establish a clear and profound understanding of this relationship. The figure below shows the framework of this study.

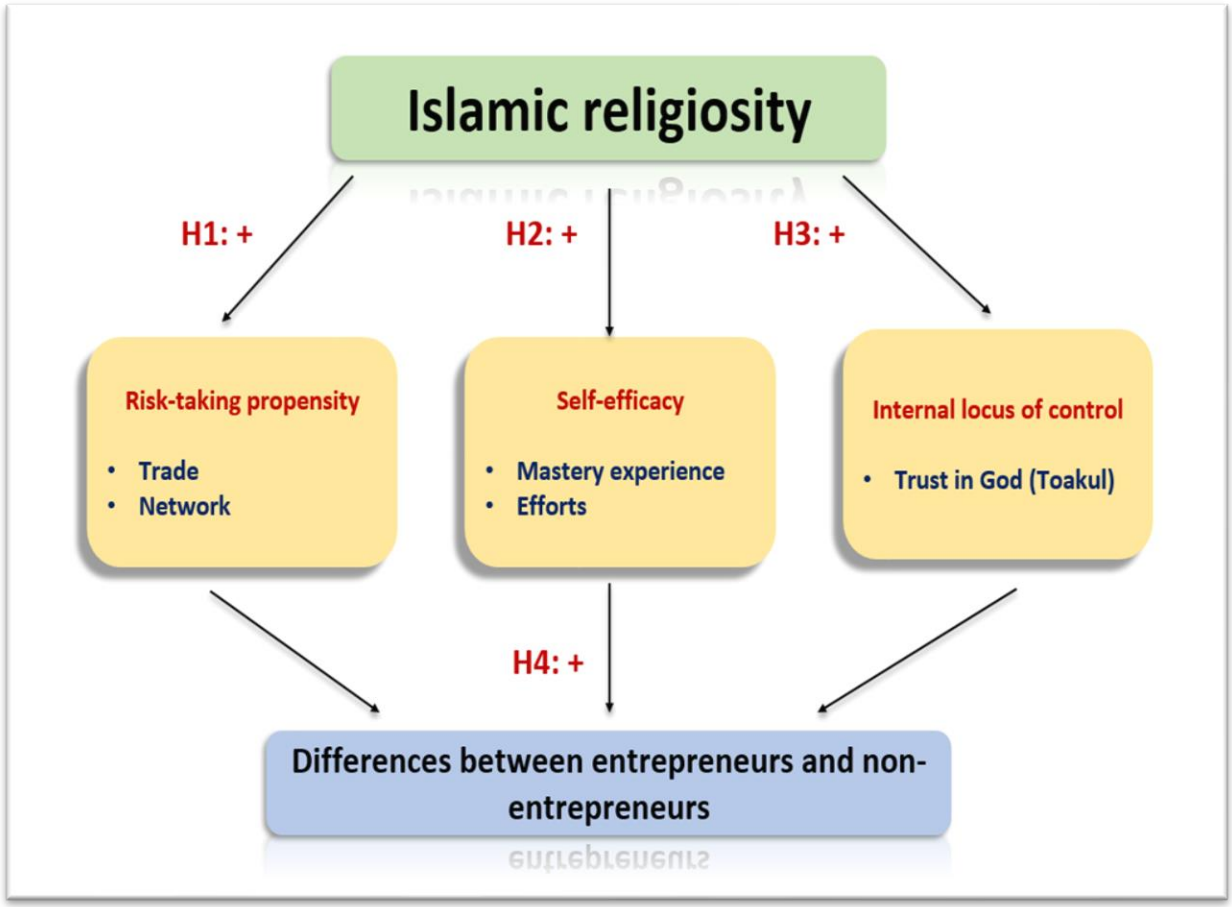


Figure (5.1): Conceptual framework and hypothesis development.

### 5.3.1. Islamic religiosity and Risk-taking,

### 5.3.1.1. (Trade):

Various previous studies have demonstrated that religious faith affects the personality attribute of risk-taking, which is connected to entrepreneurial behaviour. In addition, different religions and diverse religious dimensions have a changeable influence on an individual's attitude with respect to risk-taking (Bartke and Schwarz, 2008; Ferguson *et al.,* 2014, Noussair *et al.,* 2013). Leon and Pfeifer (2013) investigated Muslims, Christians and non-religious people in Germany and discovered significant differences between non-religious and religious individuals in risk-taking, noting that religious people are often more risk-averse compared to non-religious people. As regards finance, some research showed that Christians were more likely to take risks than non-religious people and Muslims were less likely than both other groups to take financial risks. Vogel and Hayes (1998) found that generally Muslim capital users and investors are risk-averse and favour liquidity and prefer cash reaching them promptly. Kuran (2012) suggested that the underlying factors of the comparative underdevelopment of Muslim countries economically could be due to inadequate institutions, low levels of creativity, major risk aversion and dislike of innovation. These suggestions were supported by the findings of Miller (2000), who surveyed about 5000 individuals from USA, Turkey, Italy, Japan and India which have varying social and religious attitudes. Miller's survey showed that taking part in religious activities was positively linked with risk-averse attitudes in both Muslim and Christian cultures. Moreover, Islam prohibits interest or Riba and Islamic scholars believe that insurance companies should not use interest-bearing investments; rather there is an Islamic version of insurance, Takaful, or solidarity.

The above discussion may suggest that Islamic businesses and entrepreneurs are more conservative about risk-taking than those in a capitalist market. However, Islam aims to prohibit selfish actions rather than preventing the maximization of profit that leads to greedy behaviour. Islam approves and encourages commercial risk but, on the other hand, prohibits pure speculation and obscure transactions (Vogel and Hayes, 1998). For example, the normative dimension of Islam has a role in influencing the propensity of Muslims to take risks by urging them to join risky commercial activities. As mentioned in the previous literature, the normative dimension of Islam includes religious activity, norms and values

which are taken from the Holy Quran and the Sunnah. The Holy Quran and the Sunnah are considered as important factors for individual Muslims' behaviour (Abdrabboh, 1985).

Islam sees taking part in business as being a vital aspect of life (Graafland *et al.,* 2006). The objectives of Shar'aiah cover the performance of all life activities, including economic activities. Muslims have to carry out their economic functions covered by certain rights and within particular limits. Thus, Muslims are allowed to trade and increase their wealth by taking part in any economic arenas unless they are forbidden by Shar'aiah. There are four verses from the Holy Quran that demonstrate this encouragement. God Almighty says: "***God has permitted trading and forbidden Ribâ (usury)"*** [Al-Baqarah 2:275] And says ***"(O Mohammed) Do deeds! God will see your deeds, and (so will) His Messenger and the believers"*** [Al-Taubah 9:105] And says ***"… so [Muslims] seek your provision from God"*** [Al-Ankabut 29:17] And says ***"Then when the (Jumu'ah) Salât (prayer) is finished, you may disperse through the land, and seek the Bounty of God"*** [Al-Jumu'ah 62:10]. According to Islamic principles taking part in business activities to earn money such as trade is seen as an essential part of life. In the verses above, God Almighty commands Muslims to be involved in economic life and gain a living either by self-employment or employment. However, there are two types of risk in Islam that may be involved, commercial risks and gambling (Maiseer) (Ibn Taymiyyah, 1996). Gambling is a risk that is prohibited and not allowed by Islam. On the other hand, commercial risks are permissible and allowed by Islam. Commercial risks consist of financial risks that may arise when a trader purchases a commodity to sell for profit which is an important risk and is an unavoidable part of the enterprise. Therefore, we can argue that Islam motivates Muslims to take commercial risks by encouraging them to trade through commercial ventures that might gain or lose profits.

### 5.3.1.2. Cooperative relationship and Islamic network:

Cooperative relationships and networking "act as a security blanket for the entrepreneur and could bolster not only the sense of control over an uncertain outcome but also augment risk propensity" (De-Carolis and Eddleston, 2009. p. 533). De-Carolis and Eddleston suggested that an entrepreneur's risk in relation to new venture opportunities is directly impacted by their social networks and relational capital. Sitkin and Weingart (1995) argue that an individual's network relationships can affect an individual's risk-taking. Lipparini and Sobrero (1994), in their study, found that networks facilitate risk-taking. Social

networking increases the sense of the power of an entrepreneur and may lead to greater risk-taking (Ferris and Rajkovic, 2017). Ellis (2000) found that networks link entrepreneurs with opportunities essential for the success of a venture. Freeman (1995) argues that cooperative relationships and networks deliver external information sources, advice and knowledge and 'continuous interactive. Furthermore, networks were also found to provide credibility, support and contacts for entrepreneurs (Ostgaard and Birley, 1996). Networking can aid the creation of positive expectations for market demand and co-opt competitors (Mohr *et al.,* 2011). It is possible to reduce marketplace confusion by networking which allows entrepreneurs to take risks. Where small firms might find problems obtaining external funding, having an alliance may help. Ahuja (2000) and Burt (1992) noted that external networks are seen as a factor in enhancing innovation and risk-taking. Entrepreneurs that are part of extensive social networks can respond better to opportunities and gather the necessary resources for managing their ventures (Dubini and Aldrich, 2002).

Research by Delerue and Perez (2009, p. 418) showed that small business owners tend to be involved in a cooperative relationship when they are aiming to create a potential competitive advantage over a competitor, as being part of a network increases their confidence and encourages risk-taking. The cooperative relationship between entrepreneurs encourages them to understand the opportunities and take risks in future business transactions (Gilmore *et al.,* 2004). Kim and Vonortas (2014), in a large-scale study, discovered that networking is a commonly used strategy for risk-taking by SMEs which assists in dealing with technology, financial and market risks. Moreover, the study by De-Carolis and Eddleston showed that individuals who are "well connected", having many professional and social relationships, will experience higher achievement in creating risky ventures (De-Carolis and Eddleston, 2009).

From the Islamic point of view, Islam may influence the risk-taking propensity of entrepreneurs through the principle of collaboration by which networks are created. In addition, the Islamic work ethic promotes cooperation in work and consulting with peers is a way to discover new opportunities, overcome obstacles and avoid mistakes (Yousef, 2000). Islam encourages the building of cooperative relationships that contribute to the creation of many networks between Muslims. The Holy Quran emphasises the importance of

cooperation between people where God Almighty said, ***"Help you one another in Al-Birr and At-Taqwa (virtue, righteousness and piety); but do not help one another in sin and transgression."*** (Surah Al-Ma'idah: 2). Prophet Muhammad (pbuh) said: "The believers in their mutual kindness, compassion and sympathy are just like one body. When one of the limbs suffers, the whole body responds to it with wakefulness and fever" (Milla and Abdallah, 2015, p3). Milla *et al.,* (2015) argues that cooperation is an ethical principle of Islam and it encourages Muslim entrepreneurs to take part in risky activities, provides knowledge and information and acts as a link between Muslim entrepreneurs regardless of colour, race, gender or language. God Almighty said: ***"O mankind! We have created you from a male and a female and made you into nations and tribes that you may know one another. Verily, the most honourable of you with God is that (believer) who has At-Taqwa [righteousness and piety]"*** (Surah Al-Hujuraat: 13). Islamic networks provide information and knowledge for entrepreneurs that will encourage them to increase their risk-taking propensity as Wang (2009) argues that knowledge urges entrepreneurs' risk-taking propensity.

The regulative dimension of Islam has a role in influencing the propensity of Muslims to take risks. Finke (1990) and Starke and Fink (2000) suggest that the regulative dimension of religion is demonstrated by laws concerning religion in a country. In Islamic nations, Sharia is an important sign of the regulative dimension as it both creates the laws and controls individual behavior. Sharia provides entrepreneurs with financial support, as it is often difficult for the owners of small firms to obtain funding (Burt, 1992). Thus, borrowing funds from a group within Islamic networks is a solution that allows them to take part in risky activities (Ahuja, 2000).

Sharia aims to support new businesses by engaging in different types of financing. One type is Mudharabah which is a deal undertaken by two entities agreeing to cooperate in order to obtain profit (Fathonih and Ibraimi, 2019). The first party is the holder of capital and the second party is the initiator of enterprise. Second, Musyarakah is a cooperative deal between two groups where the sharing of profit is founded on an arrangement of ratio and loss founded on the amount of capital. The third type of financial support by Sharia is Takaful. Takaful is founded on the principle of cooperation and means "guaranteeing each other" (Millar and Anwar, 2009). Under Takaful, external resources are shared to pay for

events or financial losses that none of the members of the cooperation network could afford individually. According to Kim and Vonortas (2014), external sources, information and financial support from cooperative relationships and networks may have a role in increasing the risk motive of entrepreneurs.

Thus, in Islam trade, cooperative relationships and networks are most likely to enhance the risk-taking propensity for entrepreneurs. For the above reasons, we can propose the following hypothesis:

***H1a*: Islamic religiosity has a positive effect on the risk-taking propensity among Muslims.**

***H1b*: Entrepreneurs have a greater risk-taking propensity comparing to non-entrepreneurs among Muslims.**

### 5.3.2. Islamic religiosity and Internal Locus of control:

#### 5.3.2.1. Toakul (dependence on God):

A secular view of religion is that belief in God as an active agent in an individual's life necessitates losing personal or internal control. This view suggests that believers in God are passive and will fail to attempt to solve world problems seriously (Jackson and Coursey, 1988). Accusations of the destructive impact of religious belief have also been made about religious people. It has been argued that religion causes passivity, and the acceptance of the way things are by people (Fiori and Antonucci, 2006). On the other hand, psychologists who have studied religion have investigated the belief in God and its implications in personal control and coping successfully in the world in several ways. Koenig *et al.,* (2001) reviewed a number of studies and reported a positive and significant correlation between religiousness and internal locus of control. For example, Taylor (2010) argues that some studies found positive evidence of belief in God's action in the world while others found no relationship to personal control. Similarly, Schieman (2008) argues that belief in God control was positively connected with intrinsic religious commitment and high religiosity (Pargament and Sullivan, 1981). Other studies found God control was not related to the belief that an individual is controlled by powerful other people or events (Kay *et al.,* 2010; Pargamen, 1982). External control was differentiated into powerful other people and chance (Levenson, 1974) and Jackson (1988) introduced God control as a further factor of external control. Moreover, a

number of academics have often linked external control with a reliance on two sources: God or fate. However, dependence on fate and dependence on God do not necessarily have the same denotation if there is a degree of mutuality in the relationship with God (Jackson and Coursey, 1988). Whereas fatalism is considered as an obvious causal psychological mechanism for external control, religions tend to have a more nuanced connection with locus of control.

According to the above review, it can be seen that belief in God increases external locus of control. However, a reliance on God could also improve an individual's sense of internal locus of control and develop positive psychological consequences (Fiori and Antonucci, 2006). One qualitative study which investigated religious turning points among a sample of 30 adults highlighted a comment made by a man who had cancer who said, ''I asked the good Lord to give me strength to accept my disease.'' (Fiori *et al.,* 2004). Thus, this participant felt his cancer was due to God's action and God gave him the strength to cope with his disease. The notion of ''collaborative control'' summarises the balance between internal and external locus of control and with this type of control individuals work together with others (Krause, 2003). This collaborative approach may achieve more positive outcomes than alternative religious coping mechanisms. Likewise, research on religious coping, there has been research into attribution theory to highlight how dependence on God is related to an internal locus of control. Pargament *et al.,* (1988) argue that when someone believes God is a partner in the coping process, an internal locus of control is obtained through their relationship with God. Fiori and Antonucci (2006) suggest that both the objective parts of religiosity, for example, taking part in ritual, and the more subjective aspects, such as dependence on God, can give a sense of satisfaction and thus impact on internal locus of control.

From the Islamic perspective, the cognitive dimension of Islam might enhance the internal locus of control by relying on God as Pargament *et al.,* (1988) stated that relying on God and trust in God are related to internal control. The cognitive dimension of religion is connected to the ideological aspect of that demonstrated through the expectations about religious ideas including, for example, the belief in the significance of God Almighty (Parboteeah *et al.,* 2008a, Weaver and Agle, 2002) and that God exists (Cornwall *et al.,* 1986). Spilka *et al.,* (1985) argue that subjective religious attributions, such as dependence

on God (Toakul), can offer satisfaction and thus influence one's internal locus of control. When an individual believes and trusts in God, he will be satisfied with all the results that will happen in the future, whether they are good or bad. This satisfaction will make an individual rely on himself to face all the surrounding circumstances. In addition, some studies have shown that trust in God increases individuals' commitment to their goal and reduces feelings of anxiety and uncertainty, which raises their level of internal control (McGregor *et al.,* 2010; Soenke *et al.,* 2013). Likewise, trusting God and other religious beliefs increases a person's self-confidence, which leads to an increase in internal control (Khazaei, 2019) and according to existing studies, a strong relationship between self-confidence and internal locus of control (Koh, 1996). Frenkel's theory suggests that there is a positive relationship between internal locus of control and a feeling of the meaning and aim of natural life. Trusting God with a high degree of internal locus of control correlates with a purposeful sense of life (Frankl, 1959). Islamic religious beliefs such as belief in God and trust in Him provide a high degree of feeling the true meaning of life. Thus, religious beliefs, such as trusting God, have a positive role in raising the level of internal locus of control among individuals. Likewise, the relationship between the individual and God strengthens an individual's inner personality and increases his determination (Jackson and Coursey, 1988). Strengthening the spiritual side through trust in God rises people's balance and personal strength, thus increases the level of internal control within individuals. Toakul, or dependence on God, is an Islamic tenet that refers to Muslims' belief that they should place their trust and dependence in God Almighty alone throughout their lives. According to Possumah *et al.,* (2013), the relationship between God and life on earth relies on trust. Humans should believe that God Almighty alone takes care of the results of their actions. The Holy Quran instructs believers, ***"… when you have taken a decision, put your trust in God; certainly, God loves those who put their trust (in Him)"*** [Al-Imran 3:159]. Similarly, God Almighty says, ***"…whosoever puts his trust in God, then He will suffice him. Verily, God will accomplish his purpose. Indeed, God has set a measure for all things"*** [At-Talaaq 65:3]. In Tafsir Al-Tabari, a highly respected ninth-century exegesis, this verse is interpreted as meaning that whosoever trusts God to guide him in the conduct of his life will find that God fulfills his promise to do so (al-Tabari, 2005). The Holy Quran goes further in another verse, insisting that Toakul is not an option for Muslims, but rather is obligatory: ***"… and put your trust in God if you are believers indeed"*** [Al-Ma'idah' 5:23]. The prophet Mohammed (pbuh)

asserted that true Toakul is an essential principle that benefits all Muslims and said: "If only you relied on God [with] a true reliance, He would provide sustenance for you just as He does the birds: they fly out in the morning empty and return in the afternoon with full stomachs" (Farhan, 2016). Furthermore, the position of Toakul in Islam is strongly reinforced by the fact that the Holy Quran shows that God Almighty associates it with worship, saying: ***"So worship Him (Alone), and He is the Wakîl (Trustee, Disposer of affairs, Guardian, etc.) over all things"*** [Al-An'am 6:102]. A second verse confirms this: "So worship Him and put your trust in Him" [Hood 11:123]. Ibn Alqayyim, a respected Muslim scholar, affirms that Muslims who exhibit true Toakul possess half of the religion of Islam (al-Qayyim, 1955).

Although trust in God and dependence on him are essential preconditions for achievement, it is also necessary to work hard and strive in this life for progress, provisions and sustenance. As reported by Anas Ibn Malik, a man asked the prophet Mohammed (pbuh), "O Messenger, should I tie my camel and trust in God, or should I untie her and trust in God?" The prophet (pbuh) said: "Tie your camel and trust in God" (Ahmad *et al.,* 2017). The Permanent Committee for Research and Verdicts in Saudi Arabia has ruled on this matter as follows: Toakul, in reality, does not deny actually working and striving for provision, for God Almighty has decreed that humans should work and it is from the ways that He gives people when they strive. In fact, God Almighty ordered all Muslims to both depend upon Him and at the same time to work hard and do whatever is necessary to achieve future goals. The act of striving for human sustenance is an act of physical worship while trusting and depending upon God is faith in Him (Baz and Al-Aziz, 2018). Toakul is often perceived by Westerners as fatalism. However, the disposition of submission to God (Toakul) is not a "passive" form of fatalism that negates human agency but is, in fact, a disposition whose achievement requires active and persistent work on the self (Hamdy, 2009). Through the foregoing, it is clear how Islam strengthens the internal control of the individual through the individual's confidence and trust in God (Toakul).

Despite that the previous literature found inconsistent of the influence of religion on the internal locus of control, we can argue that the religion Islam has a positive effect on Muslims internal locus of control assume the following hypothesis:

***H2a*: Islamic religiosity has positive effects on Internal Locus of control among Muslims**

***H2b*: Entrepreneurs have greater Internal Locus of control comparing to non-entrepreneurs among Muslims.**

### 5.3.3. Islamic religiosity and Self-efficacy:

#### 5.3.3.1. Mastery experiences:

Previous literature suggests that individuals advance and strengthen their opinions concerning their self-efficacy differently; experiences of mastery are one of the main channels of this influence (Bandura and Vozikis, 1994). Zhang (2019) argued that the best way for people to gain a considerable feeling of self-efficacy is either via mastery experiences otherwise by repeating achievement activities. Bandura (2010) suggested that the major influential basis of beliefs in self-efficacy is the interpretation of the result of an individual's purposive performance, known as the mastery experience. Thus, individuals' measurement of the results of their activities helps them to create better efficacy beliefs. Furthermore, gaining mastery delivers confirming experiences that add to positive feelings about future performance (Erikson, 2003).

Numerous empirical researchers have emphasised that Islam supports entrepreneurial developments (Audretsch *et al.,* 2013; Tlaiss, 2013; Gümüsay, 2014; Hassan and Hippler III, 2014). Islam encourages entrepreneurs' self-efficacy by encouraging the mastery of work which helps to improve the level of their effectiveness (Bandura and Vozikis, 1994) as self-efficacy has been reported as an essential factor for successful entrepreneurs (Markman and Balkin, 2005). Likewise, Boyd and Vozikis (1994) suggested that an individual only initiates entrepreneurial activity when their level of self-efficacy is high compared to the expected needs of a particular opportunity.

The normative dimension of Islam, such as values and norms that come from the Holy Quran and Sunnah, encourages Muslims to reach positive mastery experiences, which leads to increase their levels of self-efficacy (Wood and Bandura, 1989). In Islam, God Almighty has made the universe and its contents with perfection and says, ***"Who made everything He has created good"*** [Surah As-Sajdah:7]. This verse gives the meaning for all Muslims that work, even if it is difficult, will not be successful unless it is undertaken in the

required manner. Mohammed stated: "God loves that whenever any of you does something, he should excel in it." (Manan *et al.,* 2013). For the Islamic community, mastery of work is not only achievable by rulers and statesmen; rather, it is necessary that everyone works hard to build a prosperous nation. Ahmad and Owoyemi (2012) stated that Muslims should do their best to achieve their workplace obligations. They should complete each task responsibly and accountably and give each task their full effort as Islam believes that laziness and absenteeism are wrong. Each job should be completed on time as it is important to meet deadlines (Khadijah *et al.,* 2015). It is important to achieve both excellence and high quality of work (Manan *et al.,* 2013). In this way, Muslims who acquire several successful experiences will improve their self-confidence and, in turn, enhance their level of self-efficacy. Furthermore, successful experiences or what so-called mastery of work is important for all Muslims as it is believed that work counts as worship if it is carried out well and with honesty. Prophet Mohammed stated “God has decreed proficiency in all things” (Aghwan and Sazili, 2016). Thus, it is shown that Islam is a catalyst in increasing the level of self-efficacy as it encourages Muslims to gain experiences of mastery, one of the main foundations of self-efficacy (Bandura and Vozikis, 1994; Erikson, 2003; Zhang, 2019).

#### 5.3.3.2. Effort and perseverance:

The second effect of religion on self-efficacy is through persons' effort. Wood and Bandura (1989) suggested that it is important to have actual experience of tackling problems using effort and perseverance to obtain a steady and robust feeling of self-efficacy. Bandura (2010) emphasised the importance of effort to achieve self-efficacy, noting that some difficulties in human activities are useful to demonstrate that success often requires sustained effort. People with a considerable amount self-efficacy are willing to take the initiative and persevere in their activities (Bandura *et al.,* 1999). Setbacks in performance are helpful to teach that constant effort is required to gain success. Individuals who develop feelings of confidence in their own abilities may manage setbacks more effectively. Furthermore, once individuals are convinced that they can succeed, they are more likely to persevere when facing adversity and they rebound more rapidly from setbacks and, thus, their self-efficacy will be enhanced (Leader and Rankin, 2013). Through keeping going in tough situations, individuals emerge stronger from their bad times

(Bandura, 1997). The effort is necessary to overcome the obstacles that might prevent success. The individuals who make an effort believe that their probability of success is greater; thus, their self-efficacy increases, while the individuals with a low level of effort expect to fail when faced with difficult obstacles to success (Cassar and Friedman, 2009). Markman and Balkin (2005) noted that the creation of a new business is a formidable and daunting duty. New businesses that take personal exertion and considerable perseverance, in addition to a high amount of self-efficacy and perseverance, will allow entrepreneurs to overcome any obstacles that they meet.

The religion Islam enhances the quality of self-efficacy by promoting effort and perseverance, which are both important attributes for a successful entrepreneur (Salisu *et al.,* 2020). God Almighty has not created a difficult world where an individual is not capable of reaching their goals; rather whoever sets a target and works hard to achieve it will be successful (Fretheim, 2010). God makes clear to Muslims the great effort that he has made in this world, saying in the Holy Quran, ***"We have created you in pairs (male and female, tall and short, good and bad, and have made your sleep as a thing for rest, have made the night as a covering (through its darkness), and have made the day for livelihood, we have built above you seven strong heavens"*** [Surah An-Naba: 8-12]. This great verse urges Muslims to exert effort in order to obtain success. Muslims achieving success helps to raise their self-efficacy and self-confidence**.** The prophet (pbuh) urged Muslims to effort and perseverance and said, "It is better for anyone of you to take a rope (and cut) and bring a bundle of wood (from the forest) over his back and sell it and Allah will save his face (from the Hell-Fire) because of that, rather than to ask the people who may give him or not" (Ibrahim and Kamri, 2013, p5). The normative dimension of Islam exhorts Muslims to use all their energies in work. Allah Almighty stated, ***"So hasten towards all that is good"*** (Mbaideen, 2019. p63). In addition, Islam encourages effort and conscientiousness as well as an individual reliance on him-herself. The prophet Mohammed (pbuh) stated, "No one eats better food than that which he eats out of the work of his hand" and said, "No earnings are better than that of one's own effort" (Aldulaimi, 2016, p. 63). The second Caliph Omar emphasised that Islam holds effort in the highest regard he and said, "I would prefer dying while struggling for my sustenance and the sustenance of my children" and similarly, the

caliph Ali said, "Do not be one of those who hope for a better world to come without working for it" (Ali, 2015 p16).

Furthermore, Islam created main concepts of work ethics such as effort and competition. Ali and Al-Owaihan (2008) argue that effort and competition were the foundation for the transparency of work ethics and the morally responsible conduct of work in Islamic countries. Effort is seen as being vital for helping society as productive involvement reduces economic and social problems and permits an individual to gain decent living standards for their family (Ibrahim and Kamri, 2013). This demonstrates how Islam was a catalyst in improving levels of self-efficacy among Muslims with its encouragement of effort and perseverance. For the reasons missioned above, we assume the following hypothesis:

***H3a*: Islamic religiosity has a positive effect on self-efficacy among Muslims.**

***H3b*: Entrepreneurs have a greater self-efficacy comparing to non-entrepreneurs among Muslims.**

## 5.4. Methodology:

Within this section is the methodology utilized by the present research, including a description of the assumptions which define the specific approach, appropriate methods of amassing data, a distinct design and appropriate scrutiny to gain a complete understanding of the subject being examined. Easterby-Smith (2012) demonstrated that certain questions should be answered by the research methodology, illustrating the means that academics practice to develop a description of a social phenomenon and the preferred approaches to demonstrate this information. In addition, the research's philosophical assumptions are closely connected to the methodology. Following from this, the following chapter initially describes the philosophical outline of the study and then the procedures that have been chosen to respond to the research questions.

### 5.4.1. Research philosophy and paradigms

#### 5.4.1.1. Ontology

Firstly, questions concerning the subject's ideas and groupings and the reality of the social situation, including how these elements are related to each other, known as ontological factors, have to be considered in order to demonstrate which assumptions the researcher makes about the processes that exist in the world. One definition of this was "the essence of the phenomenon and the nature of its existence" (Duberley *et al.,* 2012, p.17). It is important to clarify the expectations that the investigator makes about what reality is like as outlined by Easterby-Smith *et al.,* (2012) to ensure that the singularity under investigation actually exists instead of being a phenomenon that is only perceived when people's attention is focused on it.

Therefore, it is vital to clarify the researcher’s choices (Symon and Cassell, 2012) and two principal schools of thought exist; the social constructionist, which is alternatively known as subjectivist and the realist or objectivist. Social constructivists believe that a particular social phenomenon is created by the perspective of an individual and consists of the actions of a person in society and the reality of the phenomenon itself (Collis and Hussey, 2013). Realists contend that social units and the world exist separate from human contributors and apart from cognitive structures. Whereas the positivist argues that the world has its own reality and is fixed, subjectivists maintain that reality is more diverse and

advances naturally but is developed socially. Humans usually understand situations as members of a social group and create new ideas and examine their experiences during the interactions that occur each day (Martin and Sugarman, 1996).

This current study examines the relationship between Islam and some entrepreneurial qualities such as risk-taking, locus of control and Self-efficacy. It argues that Islam influences characteristics of entrepreneurship and this exists in reality outside the realm of the social participant. Thus, the approach of the present research is objective.

#### 5.4.1.2. Epistemology:

In the same way that ontological questions examine philosophy concerning reality, questions about epistemology involve asking how researchers know about reality. When knowledge is studied, the relationship between the researcher and the facts to be examined should be clarified, and critically the evidence supporting that knowledge must be defined (Guba and Lincoln, 1994). Thus, the epistemology of a study demonstrates the assumptions of the researcher about the best way of questioning the nature of the world (Easterby-Smith *et al.,* 2012). Again, the positivism method of research understands the phenomenon as discrete knowledge which can be observed and measured (Collis and Hussey, 20013). In a similar way to natural scientists, the researcher is able to sustain the philosophy that examines the subject in an objective and independent way (Lewis *et al.,* 2007). According to this viewpoint, objects have a clear meaning that is separate from the awareness and principles of the researcher (Crotty, 1998). Thus, knowledge is either true or false; for positivists, it is precise, fixed and can be proven by scientific methods and characterized by numbers and statistics. Moreover, as the data or evidence already exists, the investigator must collect and organize it. It is important, however, that the researcher's own values and perceptions do not misrepresent the evidence (Collis and Hussey, 2003). This allows quantitative research to be used as it is well suited to the positivist paradigm; the information is presented in a concrete, measurable system. Collis and Hussey (2013) believe that the positivism paradigm should be taken to the study of human behaviour; thus, this study examines human behaviour in the relationship between Islam and some entrepreneurial qualities such as risk-taking, locus of control and self-efficacy. Therefore, the positivist philosophy is thought suitable for conducting this research.

#### 5.4.1.3. Axiology:

Continuing from this discussion, furthermore, it is essential to understand to be aware of the questions regarding axiological assumptions. Certain objects and values are considered to be important in the context of a research project and positivist researchers being separate from the subject under investigation, instead of considering the links between the phenomena being examined; thus, it is claimed that their studies are value-free (Easterby-Smith *et al.,* 2012). Therefore, the present research holds the philosophical position that rests on three elementary assumptions; objectivism is the ontological assumption, positivism is the epistemological stance and as the researcher is separate from the issues under examination, the axiological stance is value-free.

### 5.4.2. Research approach:

The design of the research comprises "the plan and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis" (Cresswell, 2009, p3). Thus, following the assumptions of the researcher as detailed above, certain decisions have to be made regarding the phenomenon under investigation. Furthermore, the methods of amassing data, the analysis of data and a discussion about how the results of the survey will be displayed and explained must be outlined (Cresswell, 2009).

In addition, a detailed explanation of the research approach must be specified, creating an awareness of the research philosophy and clarifying the process by which the research questions are chosen and expressed. Different research methods arguably have their own advantages and disadvantages (Taylor and Bogdan, 1984). Flick (2002) argues that there is no particular approach that is correct for all studies; instead, it is necessary to select a method contingent on the requirements of the specific study and the exact questions which are being examined. An individual researcher generally has their own preferences regarding the approaches to analysing qualitative data, which comprises an investigation of language or cultural observations or the statistical analysis of quantitative data and the decisions they take concerning the approach to the research questions and therefore vital (Kale, 1996).

Furthermore, the selected epistemology must vitally be closely matched with the selected qualitative or quantitative methods. It was argued that interpretivism often prefers qualitative data while positivists tend to use quantitative data. Alternatively, mixed-methods research can be utilized with a blend of qualitative and quantitative research approaches (Anderson *et al.,* 2009). There is frequent discussion among researchers about whether quantitative or qualitative research methods are superior, although there is a consensus about the consequences and implications of utilizing each method. Generally, it is considered that for research that assigns numerical values to observations are more suited to quantitative methods (Brynard and Hanekom, 1997). In addition, quantitative research creates various groupings and represents the experiences of the individuals being studied through a numerical method (Cresswell, 1996). Following this process, it is possible for researchers to authenticate a wide range of variables in greater detail, although fewer variances in response are obtainable. Nevertheless, utilizing data sources like interviews, observations and documents, qualitative research methods can describe social singularities in a more nuanced way (Myers, 1997). In addition, the utilization of both quantitative and qualitative methods or mixed methods may produce a more profound insight (Bryman, 2006; Bryman and Bell, 2007). An investigation, for example, into human resource workers could examine their experiences, ideas and actions using qualitative and quantitative approaches to allow a thorough analysis. However, it must be noted that there are disadvantages of a mixed-method approach, including time limits and qualified staff shortages (Anderson, 2009).

Therefore, the choice of quantitative research methods in the present study is based on several factors. Firstly, this research follows a positivist paradigm as it was stated by Bhattacherjee (2012) that this is most suitable for a quantitative approach. Secondly, this research utilises empirical quantitative methods. In conclusion, this research intends to quantify the relationship between Islam and entrepreneurial qualities such as risk-taking, locus of control and self-efficacy. The present research analyses quantitative data obtained from a questionnaire rather than qualitative data because this approach matches the philosophy which supports the study and is appropriate for investigating the phenomena under examination.

### 5.4.3. Research design:

The issues surrounding the choice between two possible methods of analysing data, deductive and inductive research methods, have been discussed by various authors (Cavaye, 1996; Tashakkori and Teddlie, 1998; Eltawheel, 2011). Initially, deductive research, as described by Hussey and Hussey (1997, p. 19), comprises research in which a theoretical and conceptual structure must be created. Utilizing empirical observation, this is then tested and certain instances are deduced from general circumstances. The deductive theory is utilised to comprehend the relationships between research and theory (Bryman and Bell, 2015). This involves a process that starts with an examination of general information and refines it to create specific facts, which is described as a top-down procedure.

Secondly, there is research known as inductive reasoning which develops novel theories through the observation of empirical reality followed by the generation of inferences from precise phenomena, progressing from individual circumstances to describing laws or generalised patterns. This bottom-up method is the opposite of the deductive approach. The current study will utilize quantitative and objective methods to obtain the data and will use a deductive approach to analyse that data and investigate the relationship between Islam and entrepreneurial qualities; thus, deductive approach is most appropriate for this study.

### 5.4.4. Data collection method

#### 5.4.4.1. Survey

The present research follows King and Horrocks (2010) in describing the principal method of collecting data for the study. It is possible to produce the central data using semi-structured survey methods created utilizing interviews or questionnaires to gather information about individuals, their behaviours, ideas and preferences clearly and systematically. Interviews can involve groups, individuals, fax or phone surveys (Fowler *et al.,* 2002, Mingers, 2001; 2003). Using survey research methods in a study has a number of positive factors compared to different methods, firstly as it creates a wide range of facts concerning the respondents as well as data that is not immediately observable, for example, a view of personal conduct, self-reported behaviour and beliefs. It is possible to utilize explanatory data to precisely report an event of a problem and in addition, it can explore

the occurrence of causal relationships (Andersen, 2009). Secondly, the data may be obtained remotely which is an advantage when the people to be studied are too numerous to be directly observed; given that the correct sampling methods are completed to ensure the representation of different sections of the population, a whole country can be studied.

Thirdly, in comparison to alternative methods such as individual case studies and experimental research, survey research is less time-consuming, more efficient and cheaper. However, it must be understood that sampling bias or non-response bias may enter into the research (Bhattercherjee, 2012). During an examination of opinions, beliefs, diverse situations and events among selected individuals and the development of a theory, research studies may delineate causal relationships (Pinsonneault and Kraemer, 1993). Furthermore, a questionnaire is more desirable than interviews as data can be obtained from a wide number of respondents more quickly and cheaper than alternative approaches. Thus, the present study collected data from 640 Muslim individuals living in Saudi Arabia using a questionnaire, having previously completed a pilot study of 20 respondents to ensure the feasibility of the research and check to the clarity of the questions. Email lists were attained from SAASI and the study data was collected in March and April 2019.

### 5.4.4.2. Sample and sampling techniques

A research population can be defined as consisting of a group of individuals, occurrences or items of interest that a particular study intends to examine (Sekaran and Bougie, 2016). Nevertheless, collecting data from the whole target population is not possible due to the amount of time and cost issues which would make the study impractical. It was recommended by Bhattercherjee (2012) that a subset of the data which has been carefully compiled can be considered as representing the whole population being studied. Thus, a suitable sampling method should be developed which closely represents the population that the research is to investigate and this has been undertaken by the present study. Additionally, several stages of sampling must be completed; initially, the target population must be defined, secondly and sampling frame must be selected and finally, using familiar sampling techniques, a sample must be selected (Bhattercherjee, 2012). Subsequently, the current research is examining the relationship between Islam and

entrepreneurial qualities such as risk-taking, locus of control and self-efficacy, and the focus is Saudi Arabia's Muslim population.

An individual Muslim is the unit of analysis and the sample frame of the research comprises a computerized list of 15,000 email IDs belonging to Saudi, which was obtained from the Saudi Arabia Authority of Statistics and Information (SAASI). Quantitative research requires probability sampling in which each population unit has a chance, known as the non-zero probability of being chosen for the sample and this chance is exactly determinable. This technique is arguably suitable for the current study because Saudi, in general, are under investigation and it is vital that a wide variety of members of the society are represented in the sample. Therefore, the sampling techniques include two stages of probability sampling; firstly, stratified sampling takes place, dividing the sampling frame into homogenous subgroups consisting of 7365 Saudi Muslim females and 7635 males. Next, systematic sampling is commenced, organising the sampling frame according to selected criteria. Then at regular intervals, elements are chosen utilising the formula k element = N/n where k is the interval, N is the sample frame and n is the size of the sample (Bhatterjee, 2012). Thus, the interval k=N/n that is k = 15000/1000 that equals 15. Random sampling is utilized because these statistical sampling methods are unbiased estimates of the parameters of the population and therefore do not necessitate weighting (Bhattercherjee, 2012). A decision has to be taken about the sample size required for quantitative research, which can range from the comfortable validity of 300 through the good validity of 500 to the exceptional validity of 1000 (Tabachnick *et al.,* 2001). It was decided that 640 Saudi individuals is a suitable sized sample for the current research.

### 5.4.5. Variables:

#### 5.4.5.1. Measures of Islamic Religiosity (IR) the independent variable:

Hill and Hood (1999) suggest that although the principal measurements of religion described in existing literature are useful to measure religious psychology, they were principally developed to study the beliefs of Christians and the followers of various other non-Muslim faiths. Furthermore, Mc Farland (1984) suggests that these scales may be suitable to study Christianity, but they and not fit for purpose in examinations into the psychological features of Muslim beliefs and activities. For the present study, it was deemed

important to clarify exactly what Islamic religiosity means. Islamic religiosity can be seen as a multi-dimensional concept that can be explained in a combination of ways (Alsanie, 198; Galbraith *et al*., 2007). The first dimension consists of Islamic beliefs, which include the belief in Allah, in prophet Mohammad, in Allah's Angels, in the Books, in the Messengers, the Day of Judgement, the Afterlife and Predestination, which are elements of the six pillars of Islam. The second dimension is Islamic conduct which covers the actions and behaviours of individual Muslims while they are living their daily existence, for example, prayer, chastity, fasting and, importantly, the pilgrimage to Mecca. Furthermore, Muslims should follow Islamic principles and abstain from all kinds of forbidden acts and conduct. Krain (2010) stated that often the methods of assessing Muslim religiosity are translated from English studies into religion without amendments from western Muslim academics. Now it is important to use more suitable methods to examine the issues which affect Muslims living in Muslim societies (Zelekha*et al*., 2014). Therefore, in this study, the Islamic religiosity measurement is mainly founded on a scale of religiosity based on the factors which will more accurately measure Muslim beliefs and behaviours (Alsanie, 1989).

With the intention of measuring accurately Islamic religiosity, the present research examined the mean score of the aggregate answers of individuals' answers to questions. In the survey, respondents were asked to specify their religious Activities and beliefs in 30 questions using five points Likert scale. The study uses the following categories; 1 = "strongly disagree" or "Never, 2 = "Disagree" or "Rarely", 3 = "Not sure" or "Sometimes", 4 = "Agree" or "Very Often" and 5 = "Strongly agree" or "Always". This results in a scale giving a range of scores from 30 to 150 and a higher score means that the respondent is demonstrating more Islamic religiosity. Myers (2000) suggested that the greater value that people place on religion is related directly to them being more or less likely to practice religion. Therefore, in this study, the individual responses to questions, which reflect religious practices and values, are combined. Thus, Islamic religiosity is actually measured using 30 items which represent the score of the group of individuals who state that they pray, fast for Ramadan and give to charity. For example, I make the obligatory prayers; I declaim the Qur'an; I complete the required fasting; I achieve the extra fasting; I tell other people untrue things; I give away the supererogatory charity; I promote virtue and prevent vice; I obey my parents; I try to smile as much as possible; I pay visits to relatives; I care

about neighbours; I fulfill my promises; I follow the Islamic code of dress; I do not abuse others; I help old people when they need it; I perform Umrah; I believe there is no God but Allah; I believe Mohammed (pbuh) God's messenger; I believe in God's angels; I believe in God's books; I believe in God's messengers; I believe in afterlife; I believe in predestination; I believe in hell; I believe in heaven; I accept usury; I attempt to bribe if necessary; I obey Sharia rules in every situation. More details of this are in appendix (1).

### 5.4.5.2. Measures of risk-taking, internal locus of control and self-efficacy, the dependent variable:

The questionnaire for this paper was organized into three sections. The first section comprised measures of demographic variables such as age, gender, educational level, work, and experience. Consequently, the data analysis controls for gender using binary variables (0/1 values). The binary variable has a value of 1 for participants who showed in the survey that they were women. Age and work experience were measured by continuous variables by years and education were measured as well by continuous variable using ascending coding which 1 represent no education and 7 represents postgraduate degree. The second section comprised independent variables to measure Islamic religiosity and the third part included dependent variables to measure entrepreneurial characteristics such as risk-taking propensity, internal locus of control, and self-efficacy. According to previous literature, a single-item measure established equally high validity as the multiple-item measure **(**Bergkvist and Rossiter, 2007; Fuchs and Diamantopoulos, 2009; Sarstedt and Salzberger, 2016). Therefore, risk-taking was measured by one scale item, which is "I believe that adventure and taking risks are important to this person to have an exciting life. This item was adopted from Mata and Ralph (2016). Internal locus of control was measured by one scale item which is, "People shape their fate themselves"; this item was adopted from Benabo (2015) world value survey. Self-efficacy was measured by one scale item which is, "When I make plans, I am certain I can make them work." This item was adopted from Sherer (1982. p. 666). When interpreting and analyzing the data, respondents were asked questions using the five-point Likert scale with the following categories: 1 = 'Strongly disagree' or 'Never'; 2 = 'Disagree' or 'Rarely'; 3 = 'Not sure' or 'Sometimes'; 4 = 'Agree' or 'Very often' and 5 = 'Strongly agree' or 'Always'.

### 5.4.5.3. Reliability and Validity:

One definition of reliability is the amount to which the measurement of a particular concept is dependable or consistent (Bhattacherjee, 2012). Therefore, if a certain scale is used to measure a concept numerous times, the findings ought to be similar every time unless the phenomenon under observation is changing. Cronbach's alpha reliability coefficient is generally used in research to test the reliability of the scale; a value between 0.50 and 0.70 indicates reasonable reliability and a value of 0.70 plus is supposed to show considerable reliability (Hinton *et al.,* 2014). The overall scale in the current research was shown to hold strong internal consistency with an alpha value of 0.8046 for Islamic religiosity which demonstrates high reliability on this measure. Moreover, the validity of a study is extremely important; therefore, pilot testing is used to identify any possible problems in the procedures or design of the research. This also has the advantage of safeguarding the instruments of measurement that are being employed to ensure that the concepts under examination and effectively measured (Miles and Huberman, 1994; Saunders *et al.,* 2003). Therefore, before the final questionnaire was circulated, an initial questionnaire was pilot tested using 20 Muslim individuals from Saudi Arabia, in order to check the clarity of the questions and acquire feedback on the general feasibility of the study.

## 5.5. Results:

### 5.5.1. Descriptive statistics:

Table (5.1) lists the answers of the 640 participants to socio-demographic questions in the survey with dependent and independent variables as percentages and means as well as standard deviations. It demonstrates that 50.16 % of the participants were men, whereas 49.84 % were women. As regards the sample's age distribution, participants were aged from 15 to 75 years and the mean age was 35.01 with the standard deviation being 14.38 years. Educational level was coded from 1 to 7, where 1 represents a respondent with no education while 7 represents a postgraduate degree. The majority (66.56 %) of the participants have bachelor or postgraduate level degrees, whereas 33.44 % had gained either an intermediate, secondary, primary or no qualification. The distribution of the participant's work experience varied in years from 1 to 40, having a mean of 11.67 years with 11.60 being the standard deviation. The dependent variables for which results are given in table (5.1) risk-taking propensity, self-efficacy and internal locus of control are classified on the Likert scale. Table (5.1) illustrates the distribution of the risk-taking of participants. The mean of respondents' risk-taking is 3.84 and the standard deviation is 1.03. Furthermore, the respondents' self-efficacy mean is 3.57 and a standard deviation 1.06. In addition, the mean of the respondents' Internal locus of control 3.70 with a standard deviation of 1.17. The results of independent variables are presented in table (5.1). Islamic religiosity is arranged on a Likert scale and religiosity was measured by 30 questionnaire items. The distribution of the sample participants for Islamic religiosity is between 30 to 150. The sample's overall mean score for Islamic religiosity is 4.51 and 0.29 is the standard deviation.

### 5.5.2. Empirical analysis:

To examine the ***H1a***, ***H2a*** and ***H3a*** hypotheses, a regression analysis (OLS) was carried out including models (Table 5.2: model 2, 4 and 6) to capture the relationship between the three main entrepreneurial characteristics of the study; viz risk-taking propensity, level of self-efficacy and level of internal locus of control, as well as Islamic religiosity amongst Muslims. Table 5.2: models 1, 3 and 5 display the effect of the control

variables on the three entrepreneurial characteristics that were considered likely to influence these characteristics.

For the risk-taking model (Table 5.2: model 2), the independent variable, Islamic religiosity, was entered in the first equation, risk-taking, utilizing OLS regression. This model examines the effect of Islamic religiosity, as Islamic religiosity is one construct on Muslims' risk-taking propensity. Thus, to examine the first hypothesis ***H1a*** saying Islamic religiosity has a positive effect on risk-taking propensity amongst Muslims' we propose the following formula of regression:

***Risk taking = f (Islamic Religiosity + Controls) + ε.***

***Y(Risk taking) = β1χ(Islamic Religiosity) + β2(Female) + β3(Age) + β4(Education) + β5(Work experience) + ε.***

Table (5.2) model 2 shows that the relationship between risk-taking propensity and Islamic religiosity is positively significant. The Islamic religiosity variable is positively significant with $p < 0.01$, and with (0.505) coefficient confirming the first hypothesis ***H1a***. Female shows negative significance with p-value < 0.1. Age, education and work experience have no effect on risk-taking propensity.

For the self-efficacy model (model 4), Islamic religiosity which is the independent variable was inserted in the second equation, self-efficacy, utilizing regression (OLS). This model examines the effect of Islamic religiosity, as Islamic religiosity is one construct on Muslims' self-efficacy. Thus, to examine the second hypothesis ***H2a*** saying Islamic religiosity has a positive effect on self-efficacy amongst Muslims' we propose the following regression formula:

**Self-efficacy** ***= f (Islamic Religiosity + Controls) + ε.***

***Y(*Self-efficacy*) = β1χ(Islamic Religiosity) + β2(Female) + β3(Age) + β4(Education) + β5(Work experience) + ε.***

Table (5.2) model 4 shows that the relationship between self-efficacy and Islamic religiosity is positively significant. The Islamic religiosity variable is positively significant with

$p < 0.01$, and with (1.068) coefficient confirming the second hypothesis ***H2a***. Female and age show negative significance with p-value < 0.05. Work experience indicates a significant positive effect with *p*-value < 0.05. Education has no effect on self-efficacy.

For the internal locus of control (model 6), Islamic religiosity which is the independent variable was entered in the third equation, internal locus of control, using ordinary least squares (OLS) regression. This model examines the impact of Islamic religiosity, as Islamic religiosity is one construct on Muslims' internal locus of control. Thus, to examine the third hypothesis ***H3a*** saying Islamic religiosity has a positive effect on internal locus of control amongst Muslims' we propose the following regression formula:

**Internal locus of control** ***= f (Islamic Religiosity + Controls) + ε.***

***Y(*Internal locus of control*) = β1χ(Islamic Religiosity) + β2(Female) + β3(Age) + β4(Education) + β5(Work experience) + ε.***

Table (5.2) model 6 shows that the relationship between internal locus of control and Islamic religiosity is positive significant. The Islamic religiosity variable is positively significant with $p < 0.05$, and with (0.409) coefficient confirming the third hypothesis ***H3a***. Age shows negative significant with *p*-value < 0.01. Work experience indicates a positive significant effect with *p*-value < 0.05. Gender and education have no effect on internal locus of control.

Table (5.3) illustrates that the differences between entrepreneurs and non-entrepreneurs on the relationship between Islam and risk-taking propensity, level of self-efficacy and level of internal locus of control. On this comparison, we use a logistic regression model (logit) to distinguish between entrepreneurs and non-entrepreneurs on these three entrepreneurial characteristics. Hosmer *et al.,* (2013 p1) stated that "What distinguishes a logistic regression model from the linear regression model is that the outcome variable in logistic regression is binary or dichotomous. This difference between logistic and linear regression is reflected both in the choice of a parametric model and in the assumptions. Once this difference is accounted for, the methods employed in an analysis using logistic regression follow the same general principles used in linear regression". As the outcome of this study is a binary variable 0 for non-entrepreneurs and 1 for entrepreneurs,

the technique used will take the form of a logistic regression approach. Therefore, in order to test the three hypotheses that entrepreneurs have a greater level than non-entrepreneurs on 1: risk-taking that influenced by Islamic religiosity ***H1b***, 2: internal locus of control that influenced by Islamic religiosity ***H2b*** and 3: self-efficacy that influenced by Islamic religiosity ***H3b*** we propose the following regression formula:

**Entrepreneurs** ***= f (Risk taking 2 + Controls) + ε.***

***Y(*Entrepreneurs*) = β1χ(Risk taking 2) + β2(Female) + β3(Age) + β4(Education) + β5(Work experience) + ε.***

**Entrepreneurs** ***= f (Self-efficacy 2+ Controls) + ε.***

***Y(*Entrepreneurs*) = β1χ(Self-efficacy 2) + β2(Female) + β3(Age) + β4(Education) + β5(Work experience) + ε.***

**Entrepreneurs** ***= f (Internal locus of control 2+ Controls) + ε.***

***Y(*Entrepreneurs*) = β1χ(Internal locus of control 2) + β2(Female) + β3(Age) + β4(Education) + β5(Work experience) + ε.***

However, the findings of models 1, 3 as well as 5 in table (5.3) show that entrepreneurs have greater risk-taking and self-efficacy comparing to non-entrepreneurs. While model 5 shows that there is no significant variation between entrepreneurs and non-entrepreneurs in their internal locus of control. Table 5.3, models 2, 4 and 6 represent the second stage of the regression. We use on this stage a logistic regression (logit) to differentiate between entrepreneurs and non-entrepreneurs in the three entrepreneurial characteristics that are influenced by Islam (risk-taking2, self-efficacy2 and internal locus of control2). We can see from table 5.3, models 2, 4 and 6 that entrepreneurs demonstrate a significant greater level of risk-taking propensity 2, level of self-efficacy 2 and level of internal locus of control 2 comparing to non-entrepreneurs. The results confirm hypotheses ***H1b, H2b*** and ***H3b***. In model 2 female and work experience shows negative significant with $p$ value < 0.01. Age and education indicate a significant positive effect on risk-taking 2. Model 4 and model 6 show similar results to Model 2. Finally, model 7 and model 8 represent the variations

between entrepreneurs and non-entrepreneurs in the three entrepreneurial characteristics. Table 5.3 illustrates the findings of the eight models more comprehensively.

## 5.6. Discussion

The results of this research showed that Islam supports a positive attitude towards risk, which is demonstrated in the previous literature, for example, Zelekha *et al.,* (2014) found that Sharia indirectly stimulates risk-taking which is a vital factor in entrepreneurial undertakings. In addition, the results of this study showed that Islam has positive effects on risk-taking following the research of Parboteeah *et al.,* (2015), who suggested that belief in God gives individuals the mental strength to cope with uncertainty which would be useful for an entrepreneur. Therefore, a strong belief in God encourages Muslims to participate in risky activities to achieve future goals. Nevertheless, this result is inconsistent with some previous literature which indicated that Islam does not support risk. For example, Kuran (2008) suggested that the underlying issues of the comparative reduced development of Muslim nations economically is possibly because of major risk aversion. Moreover, Vogel and Hayes (1998) found that Muslim capital users and investors are risk-averse, favour liquidity and prefer cash reaching them promptly. However, the result of this research supported our first hypothesis that Islam has a positive effect on risk-taking.

The findings of this present study showed that the Islamic religion supports Internal Locus of control which follows the findings of previous literature, for example, Fiori and Antonucci (2006) argue that religion increases internal control and a reliance on God could improve an individual's sense of internal control and actually improve psychological consequences. Furthermore, Spilka *et al.,* (1985) suggest that both the objective parts of religiosity, for example, taking part in rituals, and the more subjective aspects, for example, dependence on God, can give a sense of satisfaction and thus impact on internal locus of control. Moreover, this finding agrees with previous research that argues that from the Islamic perspective, Sharia enhances the internal locus of control by relying on God as relying on God and trust in God are related to internal control (Pargament *et al.,* 1988). This result agrees with previous literature, which indicated that in Islam, reliance on God works side by side with self-reliance, which in turn leads to an increase in internal control. It is what the prophet's hadith explains, as reported by Anas Ibn Malik, a man asked the prophet Mohammed (pbuh) "O Messenger, should I tie my camel and trust in God, or should I untie her and trust in God?" The prophet (pbuh) said: "Tie your camel and trust in God" (Hassan,

et. al., 2018. p 146).). Furthermore, the result of this research supported our second hypothesis, which indicates that Islam has a positive effect on internal locus of control. Nevertheless, the results of this research do not agree with some of the previous literature. For example, Jackson and Coursey (1988) argue that Islam may have a negative influence on the internal locus of control as believing Allah is an important factor in the life of Muslims necessitates surrendering a level of internal control. In addition, Muslims believe in the power of God and Jackson and Coursey (1988) argue that the belief that God is active in this life leads to personal negativity and failure to address self-problems.

The results of this research showed that Islam supports self-efficacy which follows the results of existing literature. For instance, Islam encourages Muslims to work to a high standard so that they have positive mastery experiences and therefore increase their levels of self-efficacy. This is because individuals advance and strengthen their beliefs about their own self-efficacy through experiences of mastery (Bandura, 1999; Wood and Bandura, 1989). Likewise, previous literature emphasized Islam urging Muslims to work well, and this was evident from the hadith of the prophet Muhammad, where he said, " Allah loves that whenever any of you does something, he should excel in it." (Manan *et al.,* (2013). Furthermore, the results of this research showed that Islam supports self-efficacy through effort. Studies have shown how Islam urges effort and perseverance, which is an important pillar for raising the self-efficacy of Muslims. Mohamed said, ‘‘No one eats better food than that which he eats out of the work of his hand’’ and ‘‘No earnings are better than that of one’s own effort’’ (Aldulaimi, 2016 p63). This agrees with some of the previous literature, for example, Wood and Bandura (1989) suggested that it is important to have actual experience of combating problems using effort and perseverance to obtain a steady as well as a robust level of self-efficacy. In addition, Islam holds effort in the highest regard; Caliph Imam Ali stated, ''Do not be one of those who hope for a better world to come without working for it'' (Ali, 2015. P16). This demonstrates how Islam was a catalyst in improving levels of self-efficacy among Muslims with its encouragement of effort and assiduousness. Furthermore, the result of this research is consistent with what was mentioned in the previous literature which emphasized the importance of effort to achieve self-efficacy, noting that some difficulties in human activities are useful to demonstrate that success

often requires sustained effort (Bandura 2010). This result supported the third hypothesis of this study which is that Islam has a positive effect on self-efficacy through effort.

This study showed that entrepreneurs have a greater level of risk-taking and self-efficacy compared to non-entrepreneurs, which is consistent with previous literature. For example, Stewart and Roth (2001) found that when measures of risk propensity were utilized, a variance between entrepreneurs and non-entrepreneurs was discovered. In addition, Stewart *et al.,* (1999) argue that entrepreneurs feel more positive towards risk-taking than non-entrepreneurs. Furthermore, Markman and Balkin (2005) found that entrepreneurs scored considerably more for self-efficacy, apparent control of hardship and supposed accountability over consequence of difficulty compared to non-entrepreneurs. In fact, this research showed a surprising result which is that there were no variances between entrepreneurs and non-entrepreneurs for internal locus of control which is not consistent with previous literature. For example, Gürol and Atsan (2006) have reported that entrepreneurs possess a greater level of internal locus of control compared to non-entrepreneurs. However, table 4.3 model 2,4 and 6 showed higher variances between entrepreneurs and non-entrepreneurs in all variables that are influenced by Islam which are risk-taking, self-efficacy and internal locus of control. This proves how Islam has a significant positive impact on entrepreneurial characteristics among Muslim entrepreneurs.

The present study makes a number of contributions to the knowledge about the relationship between Islam and entrepreneurial characteristics. Firstly, this study is one of the rare studies that have studied the effect of Islam on entrepreneurial characteristics. Most of the previous studies show the variances between entrepreneurs and non-entrepreneurs in entrepreneurial characteristics includes innovation, risk-taking, internal locus of control and self-efficacy. The results of this study have shown how Islam can shape these entrepreneurial characteristics. Secondly, the results of this study have illustrated how Islam can shape the differences between entrepreneurs and non-entrepreneurs in some entrepreneurial characteristics, which made the present study unique. Finally, the present study adds to the existing research concerning Islam and entrepreneurship through exploring this relationship empirically.

Although the findings of this research are significant, there are limitations that studies in the future can improve on. This research is incapable of examining whether entrepreneurial characteristics increase or reduce people's religiosity. Forthcoming research can investigate this compelling issue. In addition, the selection of participants in this research was enlisted from the population of one Islamic nation, Saudi Arabia, limiting the generality of the results. Future research can extend the area of this study by involving more examples of other Islamic countries or by involving more world religions such as Christianity, Judaism and Confucianism. Although the current study has examined the connections between Islam, risk-taking, internal locus of control and self-efficacy, future research might investigate the relationship between Islam and other entrepreneurial traits such as self-confidence, proactivity, creativity, requirement for achievement and acceptance of uncertainty, thus promoting the robustness of the present results.

The current research has various implications; it has been shown that economic growth is influenced by entrepreneurial activity; thus, it is necessary for the Saudi Arabia's government to ensure further studies on the connections between religion, entrepreneurship and economic development to obtain a more profound knowledge about this relationship. In addition, institutes of education in Saudi Arabia should make available education in entrepreneurship for all levels of students from the early stages of education up to graduation. This policy would provide all Saudi students with the best mindset for entrepreneurship. In addition, it is necessary for Saudi Arabia's government to attract experts in the field of entrepreneurship to train Saudis on the skills and tools needed for the success of entrepreneurship. Likewise, The Ministry of Media in Saudi Arabia must work to spread the culture of self-employment among members of society and it must show how Islam encourages entrepreneurship and builds positive behaviour towards its practice.

## 5.7. Conclusion:

The majority of modern individuals understand the words entrepreneur and entrepreneurship and academics in various disciplines, including psychology, sociology, business and management, economics and history, discuss issues concerning these concepts. However, academics still have not reached an agreement on an agreed definition of entrepreneurship. In this context, entrepreneurship concerns an individual who takes risks or an original venture into a new enterprise or an individual who recovers an existing enterprise (Lumpkin *et al.,* 2013). The entrepreneurial characteristics which determine successful entrepreneurship have been described in the previous literature. Much of the accessible literature has agreed unanimously that innovation, risk, self-efficacy and internal control are some of the most vital characteristics of entrepreneurship (Tyszka *et al.,* 2011). In addition, Robinson *et al.*, (1991) defined self-efficiency, control and innovativeness as being essential entrepreneurial elements. Begley and Boyd (1987) demonstrated that entrepreneurs or founders demonstrated significantly greater levels compared to non-founders in the amount of risk-taking propensity and other characteristics.

However, while the literature has investigated the relationship between entrepreneurs and various psychological characteristics, there has been less research into how religion impacts entrepreneurship. Therefore, this study examined the effects of Islam on entrepreneurial characteristics in the Kingdom of Saudi Arabia. This research discovered that Islam supports Muslims' risk-taking propensity in trade and shows that Islam commands Muslims to be involved in some activities related to the economy and earn money through either self-employment of employment. Two discrete kinds of risk are identified: the first is risk as part of commerce and the second is Maiseer or gambling (Taymiyyah, 1963). Whenever traders purchase commodities to trade for a profit, they take on commercial risks, which are an essential and inevitable factor in business activities as any commercial undertaking may lose money or hopefully make a profit. It is evident that Islam supports risk-taking by encouraging Muslims to trade, which may involve them in risky activities. The results of this research also demonstrated that Islam has a positive impact on Muslim risk-taking through the principle of cooperation and Islamic networks. Cooperation is one of the ethical principles of Islam which encourages entrepreneurs to take part in risky

activities. Furthermore, cooperative social networks in the Islamic society provide knowledge and information and act as a link between Muslim entrepreneurs and create sympathy and rapprochement between community members. Moreover, Islamic social networks provide financial support, demonstrating the importance of cooperation for entrepreneurs as it is often harder for small businesses to gain external funding so raising funds from alliance partners is a solution that motivates them to take part in risky activities (Ahuja,2000). Therefore, the results of this research supported the first hypothesis of the study which shows that Islam has a positive influence on risk-taking. Furthermore, the research results found that Islam supports the internal locus of control among Muslims through dependence on God. Sharia enhances the internal locus of control as reliance and trust in God are related to internal locus of control (Pargament *et al.,* 1988). Spilka *et al.,* (1985) contended that objective features of religiosity, including joining in prescribed rituals and more subjective aspects including the belief that having faith in God will help to improve things can give a sense of satisfaction and therefore improve an individual's internal locus of control. Dependence on God, or Toakul, is an Islamic principle related to the belief that Muslims must trust God throughout their lives. Thus, the results of this research supported the second hypothesis of the study which argues that Islam effects the internal locus of control positively.

Moreover, the study results found that Islam supports self-efficacy through effort and the mastery experience. According to the literature, individuals strengthen their beliefs about their self-efficacy and advance through the experience of mastery. It was shown that in order to gain a strong feeling of self-efficacy, individuals should repeat performance accomplishments and experience mastery (Bandura,1997). Islam inspires Muslims to work to a good standard; therefore, they gain positive mastery experiences and increase their self-efficacy levels. Allah said, " Allah loves that whenever any of you does something, he should excel in it" (Manan *et al.,* 2013). In addition, Islam encourages Muslims to achieve a number of successful experiences leading to improvements in their self-confidence which enhances their level of self-efficacy. Moreover, Islam enhances the quality of an individual's self-efficacy by promoting perseverance and effort as it is vital to experience overcoming obstacles using perseverance to gain a robust and stable feeling of self-efficacy. People who have a high amount of self-efficacy take the initiative more often and persevere (Bandura,

1997). Mohammed (pbuh) urged Muslims to use effort and persevere, saying, ‘‘No one eats better food than that which he eats out of the work of his hand’’ and ‘‘No earnings are better than that of one’s own effort’’ (Aldulaimi, 2016, p63). Thus, the results of this research have supported the third hypothesis of this study, which argues that Islam has a positive impact on self-efficacy. In conclusion, the results of this research indicated that Islam is a strong and important supporter of entrepreneurship due to its positive and clear effect on the most important characteristics of successful entrepreneurship.

**Table (5.1): Socio-demographic statistics**

| **Variable** | **(N)** | **(*P*)** | **(*M*)** | **(*SD*)** |
|---|---|---|---|---|
| **Gender** | 640 | 100 | | |
| Female | 319 | 49.84 | | |
| Male | 321 | 50.16 | | |
| **Age** | 640 | 100 | 35.01 | 14.38 |
| **Education** | 640 | 100 | 5.62 | 1.07 |
| **Experience** | 640 | 100 | 11.67 | 11.60 |
| **Risk-taking** | 640 | 100 | 3.84 | 1.03 |
| **Self-efficacy** | 640 | 100 | 3.57 | 1.06 |
| **Internal locus of control** | 640 | 100 | 3.70 | 1.17 |
| **Islamic religiosity** | 640 | 100 | 4.51 | 0.29 |

**(N):** Observations, **(*P*):** Percent, **(*M*):** Mean, **(*SD*):** Stander Deviation
* Years

**Table (5.2): The relationship between Islamic religiosity and entrepreneurial characteristics, risk-taking, self-efficacy and internal locus of control.**

| Variables | Risk-Taking | | Self-efficacy | | Internal locus of control | |
|---|---|---|---|---|---|---|
| | Model (1) | Model (2) | Model (3) | Model (4) | Model (5) | Model (6) |
| **Islamic religiosity** | | 0.505*** | | 1.068*** | | 0.409** |
| | | (0.143) | | (0.141) | | (0.162) |
| **Female** | -0.175* | -0.173* | -0.207** | -0.202** | -0.154 | -0.152 |
| | (0.0990) | (0.0981) | (0.101) | (0.0970) | (0.112) | (0.111) |
| **Age** | -0.00460 | -0.00595 | -0.0111* | -0.0140** | -0.0256*** | -0.0267*** |
| | (0.00589) | (0.00585) | (0.00602) | (0.00578) | (0.00665) | (0.00663) |
| **Education** | -0.00441 | -0.0106 | 0.0326 | 0.0195 | -0.0139 | -0.0189 |
| | (0.0408) | (0.0404) | (0.0417) | (0.0400) | (0.0461) | (0.0459) |
| **Experience** | 0.00496 | 0.00427 | 0.0152** | 0.0138** | 0.0208** | 0.0202** |
| | (0.00712) | (0.00705) | (0.00728) | (0.00698) | (0.00804) | (0.00801) |
| **Constant** | 3.827*** | 1.667** | 3.474*** | -1.089* | 4.318*** | 2.568*** |
| | (0.268) | (0.665) | (0.274) | (0.658) | (0.303) | (0.755) |
| **Observations** | 640 | 640 | 640 | 640 | 640 | 640 |
| **R-squared** | 0.019 | 0.038 | 0.033 | 0.113 | 0.030 | 0.040 |

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

**Table (5.3): The differences between entrepreneurs and non-entrepreneurs on the relationship between Islamic religiosity and entrepreneurial characteristics.**

| Variables | Entrepreneurs | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 5** | **Model 6** | **Model 7** | **Model 8** |
| **Risk-Taking** | 0.218** | | | | | | 0.153 | |
| | (0.111) | | | | | | (0.115) | |
| **Risk-Taking 2** | | 1.296** | | | | | | 5.879*** |
| | | (0.638) | | | | | | (2.092) |
| **Self-efficacy** | | | 0.378*** | | | | 0.350*** | |
| | | | (0.111) | | | | (0.113) | |
| **Self-efficacy 2** | | | | 0.699* | | | | -0.316 |
| | | | | (0.373) | | | | (1.193) |
| **Internal locus of control** | | | | | 0.0608 | | 0.0118 | |
| | | | | | (0.0924) | | (0.0945) | |
| **Internal locus of control 2** | | | | | | 1.574** | | -4.932*** |
| | | | | | | (0.774) | | (1.189) |
| **Female** | -1.353*** | -1.199*** | -1.338*** | -1.271*** | -1.380*** | -1.183*** | -1.316*** | -1.224*** |
| | (0.263) | (0.277) | (0.266) | (0.268) | (0.263) | (0.279) | (0.266) | (0.292) |
| **Age** | 0.0705*** | 0.0768*** | 0.0758*** | 0.0784*** | 0.0714*** | 0.111*** | 0.0758*** | -0.0317** |
| | (0.0152) | (0.0156) | (0.0155) | (0.0159) | (0.0153) | (0.0254) | (0.0157) | (0.0148) |
| **Education** | 0.212** | 0.203* | 0.198* | 0.185* | 0.212** | 0.219** | 0.202* | 0.163 |
| | (0.108) | (0.108) | (0.110) | (0.109) | (0.108) | (0.108) | (0.110) | (0.114) |
| **Experience** | -0.0756*** | -0.0842*** | -0.0824*** | -0.0870*** | -0.0761*** | -0.110*** | -0.0823*** | - |
| | (0.0184) | (0.0190) | (0.0187) | (0.0195) | (0.0184) | (0.0255) | (0.0188) | - |
| **Constant** | -4.565*** | -8.865*** | -5.147*** | -6.262*** | -3.954*** | -10.70*** | -5.726*** | -4.025 |
| | (0.880) | (2.678) | (0.891) | (1.581) | (0.857) | (3.552) | (1.037) | (4.640) |
| **Observations** | 640 | 640 | 640 | 640 | 640 | 640 | 640 | 640 |

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Risk-Taking 2, Self-efficacy 2 and internal locus of control 2 are predicted variables

Model 2, 4, 6 and 8 represent the results of the second stage regression.

# Chapter 6:

# Conclusion

## 6.1. Introduction

This Ph.D. thesis investigates the impact of the religion Islam on innovation propensity and three entrepreneurial characteristics: risk-taking propensity, self-efficacy and internal locus of control amongst Muslims in Saudi Arabia. The thesis relationships were examined in three interrelated papers (Chapters 2, 3, and 4) looking at a number of phenomena within the economic and enterprise environment of Saudi Arabia. These chapters focused on the impact of Islam on innovation propensity (first paper), differences between Muslim men and women in their tendency to innovate in an Islamic context (second paper) and Islamic influence on risk-taking propensity, self-efficacy and internal locus of control (third paper), correspondingly. While each paper can be considered independently, they are connected to the extent that their implications are similar. This study utilized a quantitative approach using an online questionnaire sent to Muslim individuals who live in the Saudi Arabia. A sample of 640 Muslim men and women has been used to examine the study hypotheses. Ordinary least squares (OLS) and logistic model (logit) statistical regression methods have been used to predict the study relationships.

## 6.2. Revisiting research aims and research questions

The principal goal of this thesis is to study the impact of Islamic religiosity on both innovation propensity and three entrepreneurs' characteristics: risk-taking propensity, self-efficacy and internal locus of control amongst Muslims based in Saudi Arabia. This research was covered by ten sub-aims addressed in three separate associated papers. The following subsections summarise the three papers' aims.

### 6.2.1. Aims of the first paper:

The first, second and third sub-aims addressed in the first paper pursued the impact of the three dimensions of Islam on innovation propensity in Saudi Arabia. Employing institutional theory, this paper examined the effects of the three dimensions of Islam (normative, cognitive and regulative) in shaping Muslims' attitudes towards innovation. The normative dimension of Islam explains how religious activity, norms and values, derive from the Holy Quran and Sunnah. Verses from the Holy Quran state that Allah created the world out of nothing, which is one of Allah's innovations. Allah told the prophet Mohammad

(pbuh) that mankind is the successor of Allah in this world and, therefore, Muslims should be innovative as they successors of Allah. Therefore, we expect a positive relationship between this dimension and innovation propensity. The cognitive dimension of Islam is initially related to religious beliefs, such as belief in Allah, messengers, angels. Previous studies have shown how these religious beliefs support innovation propensity and secondly influence education. Previous research noted that a number of Islamic scholars create innovation in many aspects of life including education, science and medicine. Furthermore, current studies have confirmed that the Ministry of Education in a number of Islamic countries has established a program to develop innovation in universities. The regulative dimension of Islam is Sharia, a set of rules and laws that direct individual behaviours. This study gives the example of innovation in the Islamic banking system which practices interest-free banking, Murabaha and the sharing of risk-taking. Moreover, Ijtihad is applied which, scholars demonstrate, is a kind of intellectual innovation.

### 6.2.2. Aims of the second paper:

The first aim of the second paper sought to investigate the effect of Islam on the innovation propensity of Muslim women. The second aim is to explore how Islam influences Muslim men's propensity towards innovation. Finally, the third aim is to investigate the difference between Muslim women and men concerning the relationship between Islam and innovation propensity. The available literature highlighted diverse reasons for gender differences in innovation. This includes that women often integrate their economic and work activities with their personal and family aims. A second reason is the composition of female networks which includes fewer wealthy, high status and powerful members in contrast to those of male networks. Another reason for gender differences in innovation is that women have unequal access to financial resources compared to men when they are endeavouring to innovate. Finally, women remain considerably less likely than men to access good quality education and training which limits women's innovation due to skill shortages and the knowledge that is required. In order to generate a more profound understanding, this research investigates the relationship between Islam, gender and innovation using the lens of institutional theory, covering the normative, cognitive and regulative aspects to attest a clear, reflective understanding of these connections.

### 6.2.3. Aims of the third paper:

This paper describes and identifies the relationship between Islam and number of entrepreneurial characteristics. The first aim of the third paper was to investigate the relationship between Islam and risk-taking propensity in Saudi Arabia. The second aim was to discover how Islam impacts self-efficacy. The third aim of this paper was to explore how Islam effects an individual's internal locus of control. The fourth aim was to investigate the variances between entrepreneurs and non-entrepreneurs with regards to the three entrepreneurial characteristics in an Islamic society. Most of the existing literature has agreed that risk-taking, self-efficacy and internal locus of control are essential characteristics of entrepreneurship (Tyszka *et al.,* 2011). Furthermore, Begley and Boyd (1987) showed that entrepreneurs had a significantly greater rate of risk-taking propensity compared to the general public who had not started a business. Robinson *et al.,* (1991) defined self- efficacy and internal locus of control as being essential entrepreneurial elements that differentiate entrepreneurs from non-entrepreneurs. However, although the literature has studied the relationship between entrepreneurs and numerous psychological characteristics, less research has been carried out into how Islam impacts these three characteristics. Therefore, this paper examined the effects of Islam on the three entrepreneurial characteristics in the Kingdom of Saudi Arabia.

## 6.3. Key findings:

Contrary to the dispute that the religion Islam is a central obstacle to economic development (Zelekha *et al.,* 2014), the current research has discovered empirical indication of a positive relationship between Islam and certain theories of entrepreneurship; namely innovation propensity, risk-taking, self-efficacy and internal locus of control. Three major conclusions were drawn from this thesis. Chapter 2 outlined how Islamic religiosity among Muslim believers could be linked to their innovation propensity. It discovered that religious Muslims are more likely to be involved in innovation. Moreover, this paper explained how the three dimensions of Islam (normative, cognitive and regulative) have a positive influence on Muslim attitudes towards innovation. The second paper (Chapter 3) showed how gender could modify the relationship between Islamic religiosity and innovation propensity. This paper found that Islam sustains the propensity of men and women to

innovate. It demonstrated that Muslim men have an advanced level of innovation propensity compared to Muslim women. The third study (Chapter 4) examined the influence of Islam on risk-taking propensity, self-efficacy and internal locus of control among Muslims. This paper disclosed that Islam has a positive effect on all the three entrepreneurial characteristics. These verdicts agree that religion generally and Islam particularly are essential elements that ought to be taken into consideration during the assessment of economic developments.

## 6.4. Thesis contributions:

This study contributes to current understanding in the following ways. First, this thesis contributes to the expanding literature that connects institutions, religion, innovation and entrepreneurship (Assouad and Parboteeah, 2018; Iannaccone and Berman, 2006; Dana, 2009). The institutional environment has been ignored in research on religion and entrepreneurship in general and religion and innovation in particular (Benabou *et al.,* 2015). However, this study in all its three papers highlights the role of the institutional environment through the three dimensions of Islam and how these dimensions affect Muslim's attitudes towards innovation and entrepreneurship. Secondly, this study contributes to the small amount of research that has investigated innovation and entrepreneurship in developing countries by looking at the context of Saudi Arabia. Emerging contexts are generating new insights into the science of innovation and entrepreneurship. The insights that have been created from the context of Saudi Arabia can be applied to other developing countries with Muslim populations, for example, Turkey, Malaysia and Afghanistan as these countries share many similar social organisations and customs. The results are particularly suitable to be applied to Gulf contexts such as Kuwait, Bahrain and the United Arab Emirates since they have the same civilization and culture as Saudi Arabia. Finally, many ways of measuring the effects of religions reported in the literature (Hill and Hood, 1999) are translated from the English language and are useful for measuring the Christian religion and/or other non-Muslim contexts. However, these measurements are inadequate when investigating Islam amongst Muslim societies. Thus, the Islamic religiosity measure in this study was adopted from Alsanie (1989), a Muslim scholar, who wrote in the Arabic language.

The first paper contributed to the literature of innovation and religion by examining the effects of the three dimensions of Islam on Muslims attuited toward innovation. Contrary to the available studies that follow an economic viewpoint (Benabou et al., 2015), this paper clarifies the importance of the social context of the established theory through the relationship between Islam and its propensity for innovation. This paper demonstrated that a positive attitude towards innovation increases alongside the growth in Islamic religiosity of Saudi individuals. The results of this paper found that Islam supports innovation propensity through the Islamic resources, the Holy Quran, the Sunnah (religious texts) and Ijtehad, which were ignored in the previous studies. Other academics have suggested that religion supports innovation propensity through religious networks, education and work ethics. However, in the previous studies the positive effect of religion on innovation propensity through religious texts was not mentioned which makes this study unique.

The second paper of this thesis contributed to the literature that linked the relationship between gender and religio and, the attitude towards innovation. (Voas *et al.,* 2013; Argyle and Beit-Hallahm, 1997; Crowden, 2003; Kingiri, 2010; Johansson and Lindberg, 2011; Danilda and Thorslund, 2011). Through a multi-layered explanation, institutional theory was able to clarify how religious dimensions can influence the attitudes of Muslim men and women towards innovation. While a number of previous studies demonstrated the differences between males and females in their religion and in their innovation, the results of this study describe how religion shapes the differences between Muslim men and women in their innovation propensity. Thus, this study contributes to existing knowledge about Islam, gender and innovation propensity, exploring this relationship empirically.

The third paper of this thesis added knowledge to the literature that examined the relationship between religion and the characteristics of entrepreneurship by examining the relationship between Islamic religiosity and risk taking, internal locus of control. This paper contributed to explaining how the three dimensions of Islam were able to influence these important characteristics, while this research is one of the few studies that have examined the effect of Islam on risk-taking, self-efficacy and internal locus of control, most of these studies show the differences between entrepreneurs and non-entrepreneurs in these characteristics. However, this study's results show how Islam can shape these differences.

## 6.5. Research limitations and future research:

Even though this study was undertaken thoroughly and systematically, proven restrictions exist that future research can address. One of the research limitations was the accumulation of data from only one Muslim society; all of the participants who contributed to this research live in Saudi Arabia. Collecting data from one Muslim country might reduce the potential to extrapolate from the results. Further understanding of the effect of Islam's impact on innovation propensity and entrepreneurial characteristics would be augmented by probing the phenomenon in more varied settings. Future research could extend this research by investigating more examples in other Islamic countries. Examining whether Islam affects economic phenomenon similarly in other nations but broadening the context will deliver more information to advance the study model to take into account which factors may affect these relationships. Furthermore, participants in this research were selected by recruiting from a population of only Muslim individuals. Therefore, the research did not include people from other religious groups which limits the generality of the results. Studies in the future can extend this research through examining the effect of other world religions including Judaism, Christianity and Confucianism to discover if similar findings emerge. Despite the fact that the sample size of the current research could be seen as being fairly small (N = 640), the significance of the findings is not reduced. A further possible limitation might be associated with the sample size, since a comparatively low number of Muslim believers provided the data. The results do not show if innovation propensity, risk-taking, self-efficacy and internal locus of control increase or decrease the religiosity of Muslim individuals. Future research can answer such an interesting issue and investigate this possibility. Moreover, future researchers could conduct a qualitative investigation of data from interviews to discover the opinions of participants and examine Muslims' understanding of the principles of Islam concerning entrepreneurship in Saudi Arabia. The present study utilized closed-ended questions which did not outline the individual ideas of participants which could be completed utilizing open-ended questions in an interview. A concluding possible field for additional investigation is to assess the influence of alternative elements that could impact religiosity as well as entrepreneurial characteristics, including maybe family status, culture and specific features of the legal organization, to discover their influence on the study results.

## 6.6. Research implications

This research aimed to explore how Islam influences the economy by examining its impact on Muslim propensity towards innovation and by finding out how Islam effects the three entrepreneurial characteristics in the Kingdom of Saudi Arabia. One reason for this research attempting to investigate these relationships was to combat the unemployment problem. Utilising the research findings, researchers as well the government in the Kingdom can be helped to understand the implications for further development. The present study indicates that economic development does not take place in a vacuum; instead, it occurs within the country's religious environment. It demonstrates that religion is a significant construct which impacts economic performance. Therefore, the government of Saudi Arabia should continue research linking religion with economic progress to obtain a better understanding of this relationship. Furthermore, the results of this study establish that Islam has unique wisdom as well as ideas that can be similar to non-Islamic religions. Researchers should further explore religion's influence on economic activity, concentrating on the context of the research and the study instruments that would produce conclusive insights.

The thesis conveyed several implications for research, indicating that entrepreneurs and innovators do not work separate from the world around them (Turkina, and Thai, 2015). Rather, entrepreneurs are constantly interacting amongst their environmental atmospheres. There is an additional reciprocal effect between entrepreneurs and their community institutions. Therefore, it is important for researchers to carry on with research that links entrepreneurs and innovators with institutions to develop theories of innovation and entrepreneurship. This thesis displayed that religious context is the foundation of institutional formations that might not be present in other non-religious contexts. The religious contexts might lead to the rise of diverse types of innovation and entrepreneurship. Therefore, researchers should remain examining religious contexts to reach new perceptions into entrepreneurial qualities such as innovation and risk taking. In addition, the framework of institutional theory was suitable for providing multiple levels of religion, innovation and entrepreneurship knowledge and demonstrating the relationship among Islam, innovator, entrepreneurs and policymakers. Therefore, researchers can use the institutional theory to clarify the relationship of other religions, such as Christianity, to

innovation and entrepreneurship. This study provided some implications for innovators and entrepreneurs in Saudi Arabia and other religious countries. Regarding the results of the first paper, the norms and values that come from the Holy Quran and prophet Mohammed Hadiths encourage Muslims towards innovation propensity. Hence the Ministry of Commerce should supply Seminars and discussions that interpret religious text that inspire innovation propensity and entrepreneurial characteristics. This implication will increase the population of innovators in Saudi Arabia as Muslim citizens often attempt to follow instructions in the Quran including the norms and values. The results of this study produced some implications for Saudi policymakers. Saudi Governments should take into consideration a few guidelines to promote innovation and entrepreneurship progress for both genders in Saudi Arabia. Policymakers should improve the entrepreneurial work environment and prevent gender discrimination in support and funding. Generating an institutional atmosphere for entrepreneurship growth and devoid of distinction will have a higher success rate and will increase the number of innovators and entrepreneurs in Saudi Arabia.

Additionally, this study has found that education has a significant correlation with innovation. Therefore, educational institutes in Saudi Arabia should make available education in innovation for students from the early stages up to graduation. This would provide all Saudi students with the best tools for innovative practice. This policy would provide all Saudi students with the best attitudes toward entrepreneurship. More specifically, Saudi women are educated separately from men. Thus, educational organisations in the Kingdom of Saudi Arabia need to make education for innovation and entrepreneurship available for all female students from early years education up to graduate level. This would allow all Saudi women students to be taught the best skills for innovation and entrepreneurship. The Ministry of Education should work to raise awareness about innovation and entrepreneurship by holding scientific seminars that explain the importance of entrepreneurship for individuals and for society. The Ministry of Education should also work on training students on entrepreneurial behaviour and how to realize opportunities, by organizing student trips to some major entrepreneurial companies. This initiative will sharpen the entrepreneurial orientation among Saudi students. University leaders should work to provide an entrepreneurship network for Saudi students through

which students can obtain any advice or knowledge of their future projects. This initiative will encourage Saudi students to create an idea for their future entrepreneurial project. This study demonstrated that certain challenges exist which hamper Muslim women from accessing government services. In Saudi Arabia, a male relative is required to interact with the male employees of the service which limits their innovative and entrepreneurial activities. Therefore, sections for women in Saudi government service should be given more attention to providing for their needs. Moreover, it is necessary for Saudi Arabia's government to attract experts on entrepreneurship to train Saudis by giving them the skills and tools required for successful entrepreneurship. Similarly, the Ministry of Media in Saudi Arabia should spread the culture of self-employment and it must demonstrate how Islam encourages entrepreneurship and creates positive behaviour towards its practice.

## 6.7. Chapter summary:

The results of this research disagree with the debate that the religion Islam is a major obstacle to development of the economy (Zelekha *et al.,* 2014) as it has discovered empirical evidence of positive associations between Islam and certain elements of economic development, namely innovation propensity and three entrepreneurship traits, risk-taking propensity, self-efficacy and internal locus of control. The research makes three major conclusions. Paper 1 (Chapter 2) delineated how Islamic religiosity among Muslim followers influences their innovation propensity. It established that religious Muslims have higher levels of propensity to take part in innovative activities. Furthermore, this paper elucidated how the three dimensions of Islam (normative, cognitive and regulative) have positive effects on Muslim attitudes towards innovation. Paper 2 (Chapter 3) illustrated how gender determines the connections between Islamic religiosity and innovation propensity. This paper proves that Islam inspires the propensity of both women and men to innovation, although Muslim males have a higher level of innovation propensity compared to Muslim females. The third paper (Chapter 4) demonstrated the influence of Islam on the three entrepreneurial characteristics. This paper disclosed that Islam has a constructive effect on risk-taking propensity, self-efficacy and internal locus of control. These conclusions confirm that Islam is an central component that has to be measured when evaluating the procedures of the economy.

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# Appendix:

## Appendix (1): Questionnaire

Southampton Business School
University of Southampton
University road, Southampton, SO17 1BJ, United Kingdom
Dear Sir/Madam

I am a Ph.D. candidate from Southampton Business School at the University of Southampton in the United Kingdom.

I am writing this letter to kindly request you to participate by filling this survey. This study aims to evaluate the relationship between religiosity and innovation propensity. Accordingly, the enclosed questionnaire is designed to benefit from your experience and background. This questionnaire is necessary towards the completing of my Ph.D. degree. In addition, the findings of this study will allow me to propose suitable recommendations to policy making of Saudi Arabia. **All information will be treated confidentially and will only be used for the purposes of this study. This is an anonymous survey.** There are no right or wrong answers. Participation is voluntary and participants have the right to withdraw at any time.

As a way of expressing appreciation for your co-operation in completing this survey, I will be happy to send you a copy of the results. If you would like to have a copy of the results, please fill in your details at the end of the questionnaire.

Finally, if you have any questions or would have further information about this project please do not hesitate to contact me at:

aa19g15@soton.ac.uk

Your Sincerely

Amal S. Alfawzan

## (Section 1)

## Socio-demographic (SD) questions

Please check the box that gives the best answer for you.

<table>
<tr><td>SD1:</td><td>Gender:</td><td colspan="2">□ Female</td><td colspan="2">□ Male</td></tr>
<tr><td>SD2:</td><td>Age (year):</td><td colspan="4"></td></tr>
<tr><td rowspan="2">SD3:</td><td rowspan="2">Highest level of education:</td><td>□ None</td><td>□ Primary</td><td>□ Secondary</td><td>□ High school</td></tr>
<tr><td>□ Diploma</td><td>□ Bachelor</td><td colspan="2">□ Postgraduate</td></tr>
<tr><td rowspan="2">SD4:</td><td rowspan="2">Entrepreneurship status:</td><td colspan="4">□ Entrepreneurs</td></tr>
<tr><td colspan="4">□ Non- Entrepreneurs</td></tr>
<tr><td>SD5:</td><td>Work experience:</td><td colspan="4">(……..) Years</td></tr>
<tr><td rowspan="3">SD6:</td><td rowspan="3">Monthly income (£):</td><td>□ Less than 1000</td><td>□ 1000 to 2999</td><td>□ 3000 to 4999</td><td>□ 5000 to 6999</td></tr>
<tr><td>□ 7000 to 8999</td><td>□ 9000 to 10999</td><td>□ 11000 to 12999</td><td>□ 13000 to 14999</td></tr>
<tr><td colspan="4">□ 15000 or more</td></tr>
</table>

## (Section 2):

## Islamic Religiosity (IR) questions

Please rate each of the following statements provided on a 1 to 5 point scale where:

1= Strongly disagree,2= Disagree, 3= Not sure, 4= Agree, 5= Strongly agree OR

1= Never, 2= Rarely, 3= Sometimes, 4= Very often, 5= Always

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| IR1: I pray the obligatory prayers | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR2: I recite the Holy Qur'an | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR3: I perform the obligatory fasting (Ramadan) | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR4: I perform the supererogatory fasting | ☐ | ☐ | ☐ | ☐ | ☐ |
| IRN5: I tell others things that are not true | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR6: I give away the supererogatory charity | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR7: I promote virtue and prevent vice | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR8: I obey my parents | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR9: I try to smile as much as possible | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR10: I pay visits to relatives | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR11: I care about neighbours | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR12: I fulfil my promises | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR13: I follow the Islamic code of dress | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR14: I do not abuse others | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR15: I help old people when they need it | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR16: I perform Umrah | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR17: Religion is important in my life | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR18: I believe there is no God but Allah | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR19: I believe Mohammed (pbuh) God's messenger | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR20: I believe in God's angels | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR21: I believe in God's books | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR22: I believe in God's messengers | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR23: I believe in afterlife | ☐ | ☐ | ☐ | ☐ | ☐ |
| IR24: I believe in predestination | ☐ | ☐ | ☐ | ☐ | ☐ |

| | | | | | |
|---|---|---|---|---|---|
| IR25: I believe in hell | □ | □ | □ | □ | □ |
| IR26: I believe in heaven | □ | □ | □ | □ | □ |
| IR27: I attempt to bribe if necessary | □ | □ | □ | □ | □ |
| IR28: I accept bank usury if necessary | □ | □ | □ | □ | □ |
| IR29: I obey Sharia rules in every situation | □ | □ | □ | □ | □ |
| IR30: I enjoy watching magic | □ | □ | □ | □ | □ |

## (Section 3):

## Innovation propensity (IN) questions

Please rate each of the following statements provided on a 1 to 5 point scale where:

1= Strongly disagree,2= Disagree, 3= Not sure, 4= Agree, 5= Strongly agree

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| IN1: I believe that ideas that have endured for a long time is better than New ideas | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN2: I believe that it is important to this person to think up new ideas and be creative; to do things one's own way | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN3: I depend too much on science and not enough on faith | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN4: I am worry about the problems that might be caused by change | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN5: I believe that people shape their fate themselves | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN6: I believe that adventure and taking risk is important to this person to have an exciting life | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN7: I am concerned about my inability to manage all the innovation requires | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN8: I am constantly on the lookout for new ways to improve my life | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN9: I like to take bold action by venturing into the unknown | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN10: I am willing to invest a lot of time and/or money in new ideas that might yield a high Return | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN11: I often like to try new and unusual activities that are not typical | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN12I am able to develop new ideas | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN13: I am suspicious of new inventions and new ways of thinking | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN14: I enjoy trying out new ideas | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN15: When I make plans, I am certain I can make them work. | ☐ | ☐ | ☐ | ☐ | ☐ |
| IN16: I consider myself to be creative and original in my thinking and behaviour | ☐ | ☐ | ☐ | ☐ | ☐ |

## (Section 4):

## Entrepreneurial characteristics (Risk-taking, Self-efficacy, Internal locus of control) questions:

Please rate each of the following statements provided on a 1 to 5 point scale where:

1= Strongly disagree,2= Disagree, 3= Not sure, 4= Agree, 5= Strongly agree OR

1= Never, 2= Rarely, 3= Sometimes, 4= Very often, 5= Always

| **Risk-taking** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|
| RT: I believe that adventure and taking risks are important to this person to have an exciting life | □ | □ | □ | □ | □ |

| **Internal locus of control** | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| ILC: People shape their fate themselves | □ | □ | □ | □ | □ |

| **Self-efficacy** | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| SE: when I make plans, I'm sure I can make it work | □ | □ | □ | □ | □ |

## Appendix (2): Paper 3 regression report:

Model 2, 4 and 6 in table 4.2 page 157 represent the first stage of the predicted relationship between Islamic religiosity and the three entrepreneurial characteristics, risk taking, self-efficacy and internal locus of control. We use on the first stage of this study an ordinary linear regression (OLS) between the independent variable Islamic religiosity and the three dependent variables that represent entrepreneurial characteristics, risk taking, self-efficacy and internal locus of control. Gender, age, education, and experience are control variables. The result of the first stage predicts new variables that were named risk-taking 2 which refers to risk taking that influenced by Islam, self-efficacy 2 which refers to self-efficacy that influenced by Islam and internal locus of control 2 which refers to internal locus of control that influenced by Islam

For the second stage, (table 4.3 page 158, model 2, 4, 6 and 8) represent the second stage of the regression. We use on this stage the logistic regression (logit) to differentiate between entrepreneurs and non-entrepreneurs in the three entrepreneurial characteristics that influenced by Islam, (risk-taking, self-efficacy and internal locus of control). Risk-taking 2, self-efficacy 2 and internal locus of control 2 are the independent variables, while entrepreneurs are the dependent variable. Gender, age, education, and experience are control variables.

# Appendix 3: Ethics and Research Governance Online form (ERGO)