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The Determinants of Innovation at Female-Owned Small and Medium Enterprises and Relevance in International Trade Dynamics: Evidence from Afghanistan

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Abstract

The purpose of this study is to explore determinants of innovation in female-owned small and medium enterprises in Kabul city, Afghanistan, and in turn contribute to entrepreneurship-related literature mainly in developing countries. The study employed an explanatory research design with agreement of primary data collection via a cross-sectional survey questionnaire, followed by OLS linear regression as a quantitative research approach. The sample of this study was 303 women entrepreneurs and was selected using a random sampling technique. Being mindful of such importance of innovation, this study inferred that knowledge improvement and transfer, technology, and owner-manager qualification behaviour significantly influence the innovation performance and as such regarded as the strong determinants of innovation. The study didn't account for the determinants like level of education, previous working experience, age, and profitability of the enterprise. Thus, due to frequent changes in such variables, the study may not reflect the dynamics of the data, which would have a convincing influence on the conclusion. In addition, the research has only consisted of 303 samples. Moreover, such a number may not represent the whole population of the entrepreneurs of women-led Afghan SME. The study might help women entrepreneurs in addressing the factors affecting innovation level to take actions towards improving their innovative behaviour and, in turn, contribute to job creation, wealth, and poverty alleviation.

Introduction

Innovation as academic thought started in 1934 with the work of Schumpeter in his seminal work (Rodrigue & Rodrigue, 2008). He argued in his work that changes in technology and process innovation contributed significantly to the growth of firms. It is further argued that to stimulate production function, firms need to combine innovative thought with economic activity (Gunday, Ulusoy, Kilic & Alpkan, 2011; Lee & Kang, 2007). According to him, this combination is called innovation destruction. From the viewpoint of Griliches & Mairesse(1984, Hall and Jones(1999), Innovation destruction becomes the basis of a very renowned economic theory later on. The theory of growth in Sallow's (1956) seminal work is one to name as an example. Furthermore, innovation has been constantly realised as a significant source of growth in practical as well as academic work ever since (Grossman & Helpman, 1991; Romer, 1994; Solow, 1956). According to the work of many researchers, scholars have been an advantage to secure a higher growth rate in business (Aghion & Howitt, 1998, p. 694; Romer, 1994; Solow, 1956). Sallow (1956) and many other economists believe that developing countries find it hard to catch up with dthe eveloped word because of innovation. Being mindful of such importance of innovation this study attempts to examine determinant of innovation at SMEs in Afghanistan.

Background to Study

Afghanistan amongst the least developing country (human developing index, 2018) and is in extreme need of economic growth. Economic growth as argued in the previous section is crucial to the growth of a country (Grossman & Helpman, 1991; Romer, 1994; Solow, 1956). Up to this point, nothing solid has been done to foster innovation in this country. This claim is based on extensive archival and literature search. One of the archives is the

world innovation index reported in GII (2019) in which Afghanistan is never listed intone the other hand a country's growth can better have achieved if private sector growth is given proper attention (Pakes and Griliches 1980). SMEs make up a large chunk to eighty percent of the private sector in Afghanistan (Mashal 2014). According to the Afghanistan Ministry of finance's large, medium, and small taxpayer's office over sixty-nine thousand firms have obtained a commercial license as of December 2019 (MoF, 2019). These facts and figures open a new venue for academic research to understand the determinant of innovation in this country. The following section discusses the problem statement that is the basis for the proposed study.

Purpose of the Study

Women lead entrepreneurs are becoming the pivotal dimensions to economic growth. On certain dimensions the attempt to diversification and innovation remains a bleak par below performance especially in women led enterprises. Taking a. serious note of this, the current study attempts to become a significant contribution to the existing body of knowledge on determinants of innovation.

Problem Statement

Considering the discussion in the background of the study, the research problem in this study is defined as to what determines innovation amongst female – led small and medium enterprises in Afghanistan. The author particularly chose SMEs as argued above they make a large component of the private sector in Afghanistan. The following section defines the research question of this study.

Research Question(s)

Considering the argument in the previous section, this study narrows down the problem area in the following research questions:

i.   What factors the determines of innovation amongst female – led small and medium enterprises in Afghanistan?
ii. What factors the determines of SMEs/owners' and managers' innovative performance?

Research Objective(s)
In the spirit of research questions this study defines the following objectives:

i.   To examine the determinants of innovation amongst female – led SMEs in Afghanistan.
ii. To examine the extent of Afghanistan based SMEs owner/managers' innovative performance.

Significance of the Study
Afghanistan as one of the least developing countries is in extreme needy for growth. The growth can be achieved through private sector development which SMEs make a big part

of it in this country. Meanwhile, we understand now that innovation is highly important for SMEs to grow in terms of profit. Currently, such a policy that fosters innovation is missing in Afghanistan. Therefore, this study will be a significant source of an important policy implication for the Afghanistan macro economy policy at a larger layer. The study can be also a policy level and important source for SMEs to realize their ability to apply innovation for their growth so the study will have significant managerial implications at the micro-level. It the academic side this study will open a venue for future research so a reasonable body of knowledge is created about firm-level innovation. Once this body of knowledge is created universities can include findings for business and economics curriculum.

Research limitations/implications

The study used one time data for determinants like level of education, previous working experience, age, and profitability of the enterprise. Thus, due to frequent change in such variables, the study may not reflect the dynamics of the data, which would have a convincing influence on the conclusion. In addition, the research has only consisted of 303 samples. Moreover, such number may not represent the whole population of the women entrepreneurs of Afghan SMEs. In future research, it is advisable to expand study factors, use interviews as a research tool, and make a comparison between women and men entrepreneurial performances.

Practical implications

The study might serve as an input for officials to consider such determinants of innovation and encourage an environment that increases women entrepreneurs' performance. In addition, the study might help women entrepreneurs in addressing the factors affecting innovation performance to take actions towards improving their performance and in turn contribute to job creation, wealth, and poverty alleviation.

Outline of Study

This thesis is developed in five chapters with multiple sections and sub-sections. Chapter one includes information such as the introduction in which general introduction to the thesis is discussed, the background to study where the author highlights some facts and figure that leads to the definition of the thesis statement. The thesis statement, which lays a foundation for the study follows the introduction . Aftermath, the thesis statement is narrowed down to research questions followed by the research objective. The same chapter argues the significance of the study. Chapter two documents relevant, recent, and important variables for the study. This chapter includes 25 sources, which are mostly comprised of journal articles. The same chapter consists of the research summary and gap identified therein. Furthermore, the same chapter includes a theoretical framework and hypothesis. Chapter three reports the method applied to address the problem under study. It includes research philosophy, research approach, unit of analysis, the population of study sampling procedure, data collection instruments its validity, and reliability. Chapter four reports data analysis findings and discusses if the problem statement addressed, what is the result of the hypothesis, and if the thesis matches or contradicts the findings of previous studies. Finally, chapter five will conclude the study and will offer a set recommendation policy and managerial implication of the study

Literature Review

This study has surveyed pertinent literature to identify important factors for innovation and to literature gap. Highly relevant literature is documented and included in this study. The following paragraphs and sections are organized in a manner that first it discusses highly cited sources. Sources are retrieved from reputable sources mostly journal. They include journal mostly economics and management such as policy research, Economic review, European innovation management and etc. This is followed by a detailed outline of literature in which determinants of literature is discussed. Then author presents summary of literature that effectively leads to literature gap. Afterward literature gap is discussed and finally a theoretical concept developed aligned with systematic review of literature is presented. It becomes imperative to acknowledge the highly cited literature included in this study. For this purpose, the below table summarizes top five highly cited sources on the topic.

Table 2.1. List of highly cited literature on the topic of determinants of innovation.

| Author (s)	Journal	Number of Citations
Romijn, H., & Albaladejo, M. (2002).	*Research Policy*	1458
Mohr, L. B. (1969).	*American Political Science Review*	1436
Romijn, H., & Albaladejo, M. (2002	*Research Policy*	1106

Fleuren, M., Wiefferink, K., & Paulussen, T. (2004	*International Journal for Quality in Health Care*	798
Avermaete, T., Viaene, J., Morgan, E. J., & Crawford, N. (2003).	*European Journal of Innovation Management*	443

The study also attempted to understand what keywords frequently appeared in the relevant literature.

Figure 2.1: Keyword occurrence
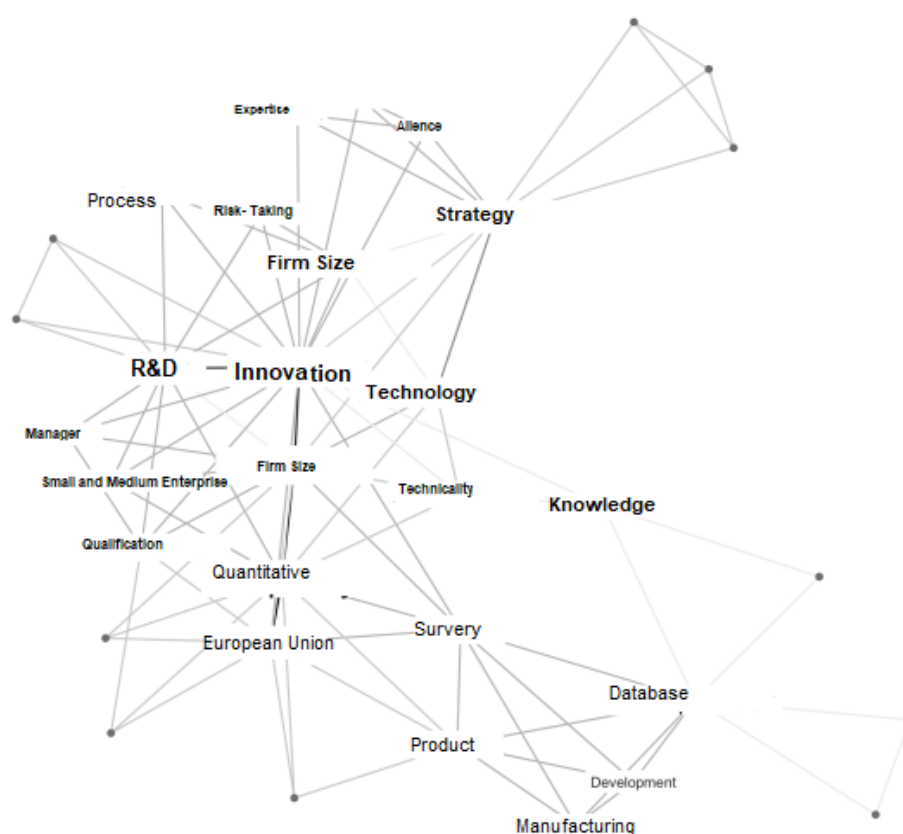
In an extensive review of literature many variables appeared to be highly emphasized these variables are such as firm size, knowledge management, technology, strategic alliance, risk taking behavior of employees/manager/owner, technical expertise of and expertise of the same. In sections to come author discusses them in greater detail. But before discussing the determinants is key to understand with innovation really is. In

the light of this statement next section defines innovation broadly in terms if busines and management philosophy.

2.1 Innovation

Literature in management and business various discussions about overseeing innovation, and if one thing's been very clear from the earliest starting point, it's that while there are huge loads of various ideas and sentiments identified with the subject, there's shockingly little agreement on what viable innovation management truly is.

As this has demonstrated to be an unending wellspring of discussion, many scholars chose to make a progression of discussion covering innovations in the board sense to attempt to demystify and explain the point for anybody intrigued. As his study currently perusing the primary research on innovation, in which the author hoping to clarify the higher perspective and address the entirety of the main topics with respect to determinants of innovation.

In any case, extant literature investigate what innovation management really is. It actually refers, as a term, is likewise a wellspring of much discussion (Adams., Bessant,& Phelps, 2006). Some contend that the very meaning of innovation implies that it can't be overseen, while others are strong professors in building frameworks and cycles to make more advancement. As you can presumably figure, the truth isn't as high contrast. Along these lines, we should initially make a stride back and consider what the term implies (Tidd, 2001).

The Merriam-Webster word reference essentially alludes to advancement as being "the presentation of something new". This isn't equivalent to just designing something new, for example, an item, as it likewise should be dispatched and acquainted with the world.

Management of innovation accordingly alludes to treatment of the relative multitude of exercises expected to "present something new", which by and by implies things like thinking of thoughts, creating, organizing and actualizing them, just as incorporating them, for instance by dispatching new items, or by presenting new inside cycles.

By just taking a gander at the definition, it's anything but difficult to demystify the term. Advancement the board is basically the way toward concocting and presenting new things and building up the business, without a doubt (Afuah, 2020).

Innovations as a board term is just the way toward concocting and presenting new things and building up the business, without a doubt. As is apparent from the definition, there's an unending wide range of sorts of advancements. This is the main driver for many the contradictions identified with advancement: individuals frequently utilize the nonexclusive term when they truly are alluding to a little subset of development, and, after its all said and done, carefully from the perspective of their own association and past experience. Before we can dig into the subtleties on the various types of advancements, we should initially try to comprehend the higher perspective

As highlighted in section 2.1. we need to discuss determinants of innovation in light of extant literature for the purpose following subsection discusses important variables the author came across reviewing literature

2.2 Firm Size

Firm size is the one of the most important variables. For instance, Adeyeye et al (2016) in their study use firm size in hypotheses as a problem of research. Other study hypothesis examines the influence of a firm's innovation activity based on the size on propensity and innovation implementation (Jabeen et al 2019). Whereas some other studies examine size of the firm on the same. The study uses Nigeria's innovation survey data and uses binary logistic regression to analyze them (Latan et al 2020). The result shows the significance of marketing innovation and the insignificance of the firm's size. The study recommends sound knowledge of the market before initiating any kind of innovation (Adeyeye et al 2016).

Similarly, Divisekera and Nguyen (2018) in their study examine the process innovation in the Australian tourism industry. They further examine the relationship between services marketing as output and innovation as input. The study used data from the Business Characteristic Survey and analysis performed logistic regression considering the CDM model. Finding suggests that increasing the size of the firm as well as rivalry in the industry has a great impact on the propensity to innovate. The study recommends sound collaboration in the industry to achieve a higher level of growth. The following figure adopted from firm size can directly influence innovation.

Figure 2.2. Firm size and innovation
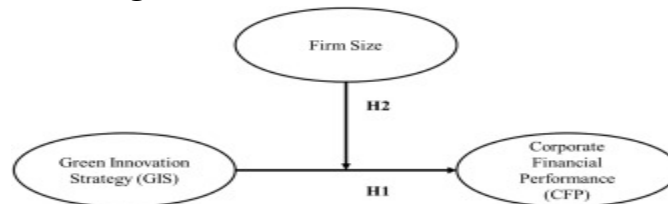
Source: Woon-Leong et al (2019)

Therefore, it can be concluded that firm size is one of the important determinants of innovation in a firm.
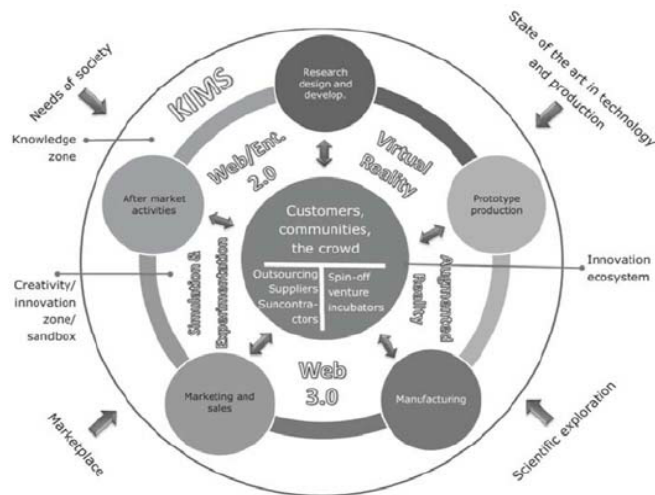
2.3 Technology

Technology is another key determinant of innovation. For example, Hadhri et al (2016) in their research article attempts to identify the effect of main economic determinants investment decisions on innovation at the firm level. The study uses the empirical material gathered in the Lebanese innovation survey for data analysis. The study uses regression analysis to build several models. The findings suggest that joint research and the use of known technology transfer mechanisms are as important for innovation. The study recommends transfer to technology.

In a research Yildiz et al (2020) investigate on role of technological capacity on the innovative ability of firms. Study use data collected in a survey questionnaire from 648 knowledge workers from 126 functional areas in Turkey's firms. Findings indicate that

employees' learning and prove orientation are important predictors of their technological ability, and that their collective technological capacity can result in positive innovation outcomes especially when their activities are highly coordinated. The study recommends a high level of coordination between employees. The following figure depict how mixture of knowledge management referred as KMS and management of technology can lead to innovation and enabling and environment ecosystem.

Figure 2.3. Technology / Knowledge management and innovation

Source: Elissaveta Gourova (2018)

Therefore, we can understand that technology is an important variable for innovation.

2.4 Knowledge Management

Laeeque et al (2017) in their research investigates the intervening impacts of information creation in the connection between learning organizations (LO) practices and innovative approaches. Analyses were performed with an example of workers from Pakistani telecom organizations. Discoveries from structural equation modeling displaying connections between LO practices and information creation, with the two being basic drivers of innovation performance of firms. The discoveries further stress that information creation assumes a fractional intervening job in connecting the LO practices to innovation.

In an empirical study, Nieves and Osorio (2016) analyze the role of organizational knowledge and collaborative human resources practice on innovation at the firm level. Study use 7 points Likert scale survey questionnaires to collect data and applies exploratory factor analysis to analyze them. Findings suggest that the results show that existing knowledge in a certain domain provides a base for introducing innovations and recommends knowledge improvement.

In a study Roffeei, Yusop, and Kamarulzaman (2018) follow the objective model development of innovation knowledge which leads to desirable student innovative behaviors. The study uses a questionnaire collected from 1008 students from Malaysian universities. The study applies to structural equation modeling. The finding suggests that self-efficacy and effective and communicative knowledge leads to innovation behavior. The same is recommended.

2.5 Strategic Alliance

The existing literature interpreted strategic alliance in many form. The later includes cooperation with suppliers, government and other important actors in industry.

In their study Barata and Fontainha (2017) aims at identifying if product and process innovation is a determinant in the traditional low-tech sector in the European construction sector in Europe. The study uses microdata from a business survey of the European Commission. The study utilizes binary logistic regression. The finding suggests the growth of business and suppliers significantly affects innovation in the construction sector. The study recommends the identification of reliable suppliers.

In their study Jabeen et al (2019) examine factors that influence innovation in female-owned firms in Emirates. Data is collected through interviews with 50 female entrepreneurs. findings suggest that Female SME owners prioritize government policies, research and development, innovation strategy, and skill development as the main criteria that influence their innovation decisions. Research recommends sound government policy development.

Pippel (2018) in a study examine if specific research and development cooperation alliance have a link in chances of failure in innovation the study uses German's community innovation survey and applies coefficient correlation statistic to analyze the data. The study's findings reveal that while R&D cooperation with public research institutes is significantly and negatively related to the probability to cancel a process innovation project. The studies recommend a partnership with suppliers.

Seenaiah and Rath (2018) in a study investigating what determines innovation amongst manufacturing firms in India. The study uses a survey questionnaire collected from 190 manufacturing firms. The study applies regression and finds that import intensity significantly affects innovation behavior. The study recommends more attention to export development (Mirza.2020).

In a study Latan et al (2020) examine the role of continuous innovation on firm innovation performance. The study further examines the role of ISO certifications on firm-level innovation in an emerging economy. Data is collected through a survey questionnaire and applies covariance-based structure modeling. Findings suggest a connection with ISO certifications to remains innovative. The same is recommended in the study.

As it might have been noted in above that cooperation and alliance with institution like suppliers, foreign companies for export purposes, government and quality assurance agencies like ISO can be very beneficial to innovation.

2.6 Qualification and Skill/Expertise

The existing literature defines qualification as it literally is. It further defines skill and expertise as technical knowledge, research and development, market knowledge and competitiveness and learning outcome.

The point in Hue (2019) is the examination to experimentally analyze the determinants of the advancement choice for Vietnamese assembling firms by utilizing a broad firm-level board dataset for the period 2010–2013. This investigation applies the

innovation organizational environment (TOE) model to investigate the impact of these variables on the innovation choice of firms with regards to creating nation-specific in Vietnam. The outcomes show that the mechanical variables that are spoken to by a higher level of skillful and highly qualified employees and that are situated in innovatively concentrated divisions have all the earmarks of being basic components for the innovation choice.

In their research Le and Lei (2019) explores the extend with each aspect of innovation such as process innovation and the product is affected by managers and employee's qualification. The research uses a participant survey between 349 participants in 88 firms based in China. The study uses structural equation modeling to analyze the data. Findings suggest the mediating effect of knowledge sharing mediates the effect of qualification on innovation. The study recommends knowledge sharing improvement amongst firms

In their study Jabeen et al (2019) examine factors that influence innovation in female-owned firms in Emirates. Data is collected through interviews with 50 female entrepreneurs. findings suggest that Female SME owners prioritize government policies, research and development, innovation strategy, and skill development as the main criteria that influence their innovation decisions. Research recommends sound government policy development.

Laeeque et al (2017) in their research investigates the intervening impacts of information creation in the connection between learning organizations (LO) practices and innovative approaches. Analyses were performed with an example of workers from Pakistani telecom organizations. Discoveries from structural equation modeling displaying connections between LO practices and information creation, with the two being basic drivers of innovation performance of firms. The discoveries further stress that information creation assumes a fractional intervening job in connecting the LO practices to innovation. The investigation proposes that giving preparing to the board to both, compelling usage of LO rehearses and expanding intra and between departmental cooperation for information creation, could be helpful and vital choices to improve and support innovation performance.

In a study Wyll and Pippel (2016) use two hypotheses as a problem of research. The first hypothesis examines the influence of a firm's innovation activity on propensity and innovation implementation. Whereas the second one size of the firm on the same. The study uses Germany's community innovation survey data and uses binary logistic regression to analyze them. The result shows the significance of marketing innovation and the insignificance of the firm's size. The study recommends sound knowledge of the market before initiating any kind of innovation.

2.7 Summary of Literature

The recent and relevant literature to innovation direct to the following points: (1) most of the scholarly works is done in developed and European countries in particular. However, we have also few cases of developing countries such as India, Vietnam, and Nigeria. Studies are mostly quantitative using either databases or survey questionnaires.

Knowledge, technology, strategy, firm size, risk, qualification and skills and expertise are keywords across literature. The next section discusses the gap in documented literature. The following table summarizes present the summary of literature reviewed.

Table 2.2. Summary of literature review on the topic

Author	Problem	KM	T	SA	FS	RTB	Q	TE	Context
Adeyeye et al (2016)	Micro-level determinants of innovation				✓			✓	UK
Jabana et al (2019).	innovation decisions among female-owned SMEs				✓				Nigeria
Latan et al (2020)	continuous innovation and firm performance				✓				EU
Divisekera and Nguyen (2018)	innovation in tourism	✓			✓				Australia
Woon-Leong et al (2019)	Firm Size and innovation				✓				China
Hadhri et al (2016)	innovation activities in small and open economies		✓						Lebanon
Yildiz et al (2020)	Individual and contextual determinants of innovation performance		✓						Turkey
Elissaveta Gourova (2018)	Innovation and knowledge management		✓			✓			EU
Laeeque et al (2017)	determinants of innovation performance	✓							Pakistan
Nieves and Osorio (2016)		✓							EU
Roffeei, Yusop, and Kamarulzaman (2018)	Innovation Culture amongst Higher Education Students	✓			✓				Malaysia

Author	Topic				Country
Barata and Fontainha (2017)	of innovation in European construction firms	✓			EU
Jabeen et al (2019)	innovation decisions among female-owned SMEs	✓			UAE
Mirza (2020)	Innovation and export performance amongst manufacturing firms				Afghanistan
Pippel (2018)	strategic alliance as determinants of innovation failures	✓			EU
Seenaiah and Rath (2018)	innovation in selected manufacturing firms	✓			India
Latan et al (2020)	continuous innovation and firm performance	✓			EU
Hue (2019)	of innovation in manufacturing firms:		✓	✓	Vietnam
Le and Lei (2019)	innovation capability and the roles of transformational leadership, knowledge sharing and perceived organizational support	✓	✓	✓	China
Jabeen et al (2019)	innovation decisions among female-owned SMEs		✓		UAE

| Wyll and Pippel (2016)	Types of cooperation partners as determinants of innovation failures			✓	✓	Germany

Source: Author compilation

2.8 Literature Gap

In the literature documented above, there was no literature in the least developing countries like Afghanistan. This leaves a contextual literature gap. Besides, country context is always worthwhile for a research topic. Whereas determinates of innovation have never been investigated in Afghanistan this study fills this gap by identifying such determinant at the SMEs level and particularly in women-led business. Furthermore, simultaneous effect of variable defined in theoretical framework is not examined before. Likewise, investigation of firm characteristic and individual characteristic on innovation is new in literature.

2.9 Theoretical Framework

In light of discussing the literature as above following schematic diagram presents the concept developed in this study.

Figure 2.4. Theoretical framework
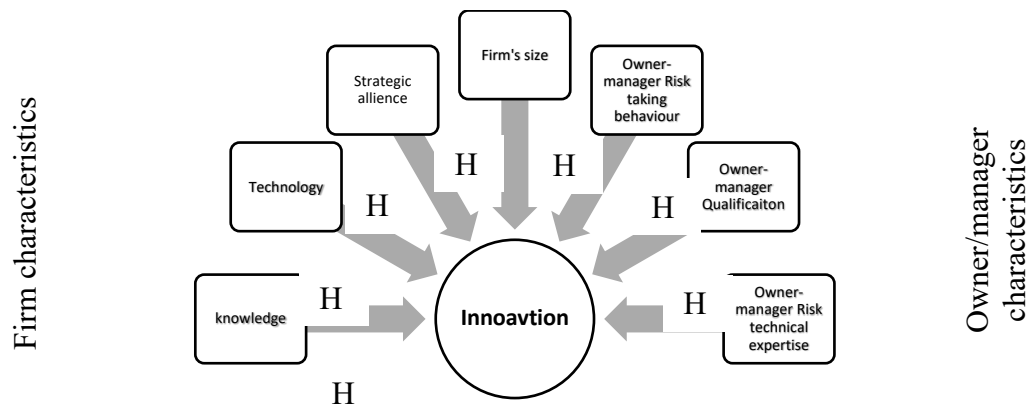
Source: Author compilation

The following expression shows the mathematic expression of the above concept:

Based on the above concept and model the following hypothesis are formulated:

H_1: knowledge improvement and transfer have a significant effect on the innovative performance of SMEs

H_2: Technology can significantly and positively affect innovation performance of SMEs

H_3: Strategic alliance can significantly and positively affect innovation performance of SMEs

H_4: Firms' size can significantly influence the innovation performance of SMEs

H_5: owner-manager risk-taking behavior significantly influence the innovation performance of SMEs

H$_6$: owner-manager qualification behavior significantly influences the innovation performance of SMEs

H$_7$: owner-manager technical expertise and experience significantly influence the innovation performance of SMEs
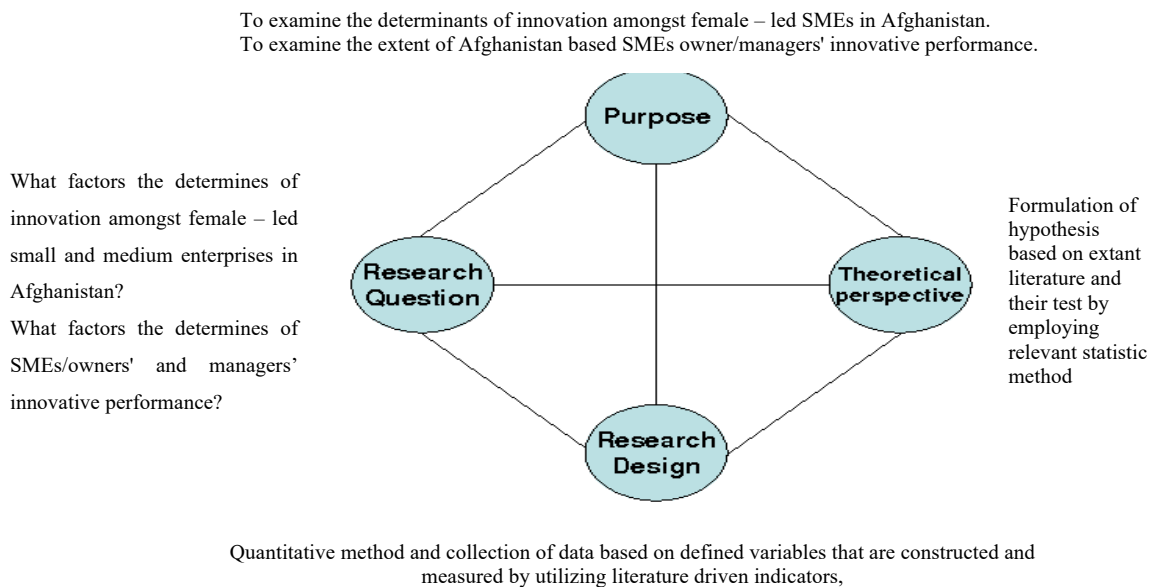
Research Methodology

In this chapter, section, and subsequent subsections, the author discusses the method to be applied for the conduct of this study. The section highlights research philosophy, research approach, research method, unit of analysis, research method, population and sample, research instrument and variable operationalization, data collection, and their analysis procedure reliability and validity of data collection instrument.

Research Philosophy

It is a belief that the researcher holds, and around which data is collected. Epistemology is a type to name as an example. Whereas the philosophical approach of research is consisting of being normative, interpretivism, and positivist.

Figure 3.1. Research Philosophy

To examine the determinants of innovation amongst female – led SMEs in Afghanistan.
To examine the extent of Afghanistan based SMEs owner/managers' innovative performance.

What factors the determines of innovation amongst female – led small and medium enterprises in Afghanistan?
What factors the determines of SMEs/owners' and managers' innovative performance?

Formulation of hypothesis based on extant literature and their test by employing relevant statistic method

Quantitative method and collection of data based on defined variables that are constructed and measured by utilizing literature driven indicators,

Source: Author compilation

This study philosophical approach is positivism as the study intends to the findings to remain data-based and objective as opposed to subjectivity. In the above figure, the study has summarized research philosophy.

Research Approach

The research approach refers to either inductive or deductive. In an inductive approach, the author moves from observation to theory formulation whereas, in the case of deductive approach research points to specificity from general theories.

Figure 3.1. Research approach
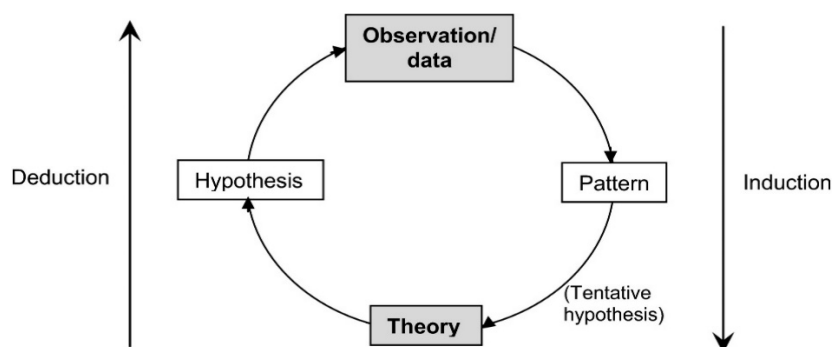
Source: Wiley online library

The figure above summarizes research approach. The approach for this study is deductive as the author intends to test hypotheses formulated on the general theories.

Research Method and Unit of Analysis

The nature of the existing study is quantitative as the study collects data based on a structured questionnaire and apply the quantitative technique to analyze them. The entity based on which data is collected and analyzed is called the Unit of analysis. The unit of analysis can be industry, regions, economies, firms, and individuals. For the sake of this study unit of analysis refer to female – led SMEs about which data will be collected.

Population and Sampling Method

Population refers to the largest set in which elements possess common characteristics to the researcher. This common characteristic refers to variables. A smaller subset of this set is called the sample. For this study, the population refers to female owned SMEs in Afghanistan. Whereas the size of this population is not known for the author at this point, the sample size is proposed 385 female – led SMEs in Kabul to ensure a minimum level of generalizability. The said sample size is selected based on Krejcie and Morgan (1970).

Table 3.1. Determination of sample size

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	102	700	248	1000	360
150	108	750	254	1500	375
160	113	800	250	2000	377
170	118	850	265	3000	379
180	123	900	269	4000	380
190	127	950	274	5000	381
200	132	1000	278	7500	382
210	136	1100	282	100000	384

Source: Krejcie and Morgan (1970)

As it is seen in above table a size of 385 sample will be required for an unknown population. Since the author resides in Kabul city it will be continent for her to survey Kabul based

SMEs the geographical location will remain Kabul city. Therefore, the method for selection of respondent will remain researcher convenient.

Data collection procedure

Data in research generally is collected from existing databases/ archives, through questionnaires through interviews, and focus group discussions. Due to the lack of information on the area of innovation in Afghanistan, the author is compelled to raise questionnaires to collect data. Out of 385 distributed questionnaire 303 retrieved which makes almost 79% response rate. Keeping in view method of data collection i.e. self-administration of questionnaire the response rate is acceptable(Roffeei, Yusop & Kamarulzaman, 2018).

Instrumentation and Operationalization

The author intends to develop a structured questionnaire as a data collection instrument. Operationalization will be applied by the operational definition proposed in the conceptual framework. The questionnaire will be divided into several components which each will define and measure a particular variable. The table below explain each component i.e., variables, indicator that measure the variables according to given scale and source of each indicator retrieved.

Table 3.2. Variable construction and data collection instrument

Variable	Indicators	Source
Innovation	1. Introduction of new product in terms of functionality and feature and usability 2. Introduction of new process in terms of functionality and feature and usability 3. The development of new products, changes in design of established products 4. Creating new products or improved versions of existing products that increase their uses. 5. Use of new materials or components in the manufacture of established product	Wyll and Pippel (2016); Jabeen et al (2019)
Knowledge Management	1. Validate and prioritize concepts through concept testing. 2. Comparison and move forward with the concept and ideas that perform at the top. 3. Determine the concept(s) that may be the most profitable based on the assessment the market by using a customer segmentation process. 4. Refinement of the concept by developing a prototype to put into a formal product development process and incorporate user testing to iterate further	Graham, Stendardi, Myers, and Graham (2002)
Technology	1. Innovation was possible because of availability of technological infrastructure. 2. Acquisition of new machinery makes innovation possible. 3. Use of technology such as website enabled enterprise come up with innovative marketing strategy. 4. Use of information communication technology smoothen product and process innovation and development.	Le and Lei (2019); Hue (2019)
Strategic Alliance	1. Enterprise partnership with universities led to innovation. 2. Enterprise public engagement enabled enterprise to innovate	Latan et al (2020); Seenaiah and Rath (2018)

	3.	Enterprise close relations with retailers made innovation possible.	
	4.	Enterprise relation with suppliers made innovation possible.	
Firm size	1.	Firm's asset is a reason behind innovation	Pippel (2018); Mirza (2020);
	2.	Firm's number of employees is a reason behind innovation	Woon-Leong et al (2019)
Owner/manager risk taking behaviour	1.	Owner/Manager is not risk averse	Mirza (2020);
	2.	Owner/Manager accepts taking risk when new opportunity arises.	Rath (2018)
	3.	Owner/Manager accept risk of entering in new information	
Owner/manager qualification	1.	Owner/Manager is has a high qualification	Elissaveta Gourova (2018)
	2.	Owner/Manager is overseas educated	
Owner/manager technical expertise	1.	Owner/Manager is an engineer	Wyll and Pippel (2016); Hue (2019)
	2.	Owner/Manager is a computer scientist	
	3.	Owner/Manager has high technical expertise	

Source: Author compilation

Note: Refer to Appendix A for detail of indicators shown in the above table.

Data reliability and validity

The data collection instrument will be consulted with experts for validation it will be further piloted before distribution to identified participants. The reliability will be measured by testing Cronbach's alpha through technologies like SPSS and Excel at the disposal of the author.

Data Analysis Method and Model Specification

Data will be analyzed utilizing linear regression and descriptive statistic to validate the model proposed on the conceptual framework. A multiple linear regression will be utilized to construct the following model and thereby test it.

$$Innov=a+\beta_1 KS+ \beta_2 Tech+ \beta_3 StAll+ \beta_4 FiS+ \beta_5 OMRTB+ \beta_6 OMQ+ \beta_7 OMTEE+$$

$$(1)$$

Where:
Innov= Innovation
KS= Knowledge sharing
Tech= Technology
StAll= Strategic alliance
FiS= Firms' size
OMRTB=owner-manager risk-taking behavior
OMQ= owner-manager qualification
OMTEE= owner-manager technical expertise and experience

Summary of Methodology

In summary, this study will be quantitative research and the required data will be collected through questionnaires. The study will attempt to build a model for prediction and future reference. Since the research findings will be at a firm study will utilize a unit of analysis as an entity for analysis while data will be collected from firms operating in that specific industry which is manufacturing for the sake of this study.

Data Analysis and Findings

This chapter present analysis of data and its findings. The chapter is comprised of sections such as descriptive statistics in which variables descriptive characteristics such as mean, standard deviation, Skewness and Kurtosis is presented and discussed. The next section analyzes variable's reliability. The subsequent sections discuss how each variable included in the model has impact on SME level innovation.

Descriptive Statistics

In order to get a feel on data overall and the distribution study has applied descriptive statistics. As mentioned earlier, the descriptive statistic includes mean, standard deviation, Skewness and Kurtosis. Table 4.1. presents the said analysis.

Table 4.1. Variables Descriptive Statistics

| | N | Mean | Std. Dev | Skewness | | Kurtosis | |
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Innov	303	3.47	0.76	0.32	0.14	- 0.63	0.28
KS	303	3.66	0.55	- 0.75	0.14	2.66	0.28
Tech	303	3.76	0.60	- 0.92	0.14	1.59	0.28
StAll	303	3.78	0.74	- 1.53	0.14	3.04	0.28
FiS	303	3.84	0.73	- 1.38	0.14	3.28	0.28
OMRTB	303	3.87	0.61	- 1.41	0.14	4.32	0.28
OMQ	303	3.65	0.60	- 1.05	0.14	2.32	0.28

Source: SPSS output table

In the table above the value of 303 refers to number of respondents or observation. Furthermore, according to table above, all variables have value of mean above the mean value. For instance, innovation (mean = 3.47), knowledge management (mean = 3.66), technology (mean = 3.76), strategic alliance (mean =3.78), firm size (mean = 3.84), owner/manager risk taking behaviour (mean = 3.87) and owner/manager qualification (mean = 3.65). mean value of variable above 3 indicate that they were significant and researcher had the confidence to apply further analysis. In addition to mean value, table also presents skewness and kurtosis values to show the normality of data distribution. For instance, the innovation (skewness = .32) knowledge management (skewness = -.75), technology (skewness = -.92), strategic alliance (skewness =-1.53), firm size (skewness = -1.38), owner/manager risk taking behaviour (skewness = -1.41) and owner/manager qualification (skewness = -1.05). the skewness value in the range between -2 and +2 indicate data's normal distribution however, the negative sign shows that data is slightly skewed in the left but normal. Similarly. Table shows another indicator for data normality i.e. kurtosis. For instance. the innovation (kurtosis = .63) knowledge management (kurtosis = 2.66), technology (kurtosis = 1.59), strategic alliance (kurtosis =3.04), firm size (kurtosis

= 3.28), owner/manager risk taking behaviour (kurtosis = 4.32) and owner/manager qualification (kurtosis = 2.32). the kurtosis value in the range between -3 and +3 indicate data's normal distribution with slight high peakiness.

Reliability Test

Data reliability test indicate if study can proceed with further analysis. The study applied Cronbach alpha to test data reliability. The Cronbach alpha of .70 or higher is acceptable. Table 4.2 shows that none of variable is below the said accepted value.

Table 4.2: Reliability Test

No	Variable	Cronbach Alpha	Item
1	Innov	.740	5
2	KS	.810	4
3	Tech	.835	4
4	StAll	.844	4
5	FiS	.813	2
6	OMRTB	.802	3
7	OMQ	.867	5
	Overall	**.784**	**27**

Source: SPSS output table

For instance, innovation (Cronbach Alpha = .740), knowledge management (Cronbach Alpha = .810), technology (Cronbach Alpha = .835), strategic alliance (Cronbach Alpha =.844), firm size (Cronbach Alpha = .813), owner/manager risk taking behaviour (Cronbach Alpha = .802) and owner/manager qualification (Cronbach Alpha = .867). As mentioned earlier, the values of Cronbach alpha above .70 made the researcher confident to proceed with rest of data analysis.

Data Diagnostics

Data Normality

Table 4.3: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Innov	.162	303	.051	.542	303	.056
KS	.100	303	.102	.668	303	.054
Tech	.115	303	.130	.562	303	.051
StAll	.112	303	.073	.452	303	.054
FiS	.113	303	.053	.443	303	.052
OMRTB	.108	303	.061	.563	303	.051
OMQ	.175	303	.060	.721	303	.063

a.   *Lilliefors Significance Correction*
Source: Data output from SPSS

In statistics, normality tests are used to determine if a data set is well-modelled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normally distributed. In this case, the sample size is greater than 50. Therefore for evaluating the normality of data, the results of the Shapiro-Wilk are employed. The Shapiro-Wilk test for normality is available when using the distribution platform to examine a continuous variable. The null hypothesis for this test is that the data are normally distributed. If the p-value is more significant than 0.05, then the null hypothesis is not rejected. Therefore, reflecting the normality of data. The significant values are all greater than 0.05, depicting that the data for the study variables are normally distributed.

Multicollinearity Diagnosis

Table 4.4: Collinearity Diagnostic Coefficients

Model		Tolerance	VIF
1	(Constant)	.452	2.031
	Innov	.491	2.036
	KS	.423	2.012
	Tech	.412	2.031
	StAll	.376	2.042
	FiS	.389	2.570
	OMRTB	.470	2.126
	OMQ	.561	1.782

Source: Data output from SPSS

The Variance Inflation Factor (VIF) measures the impact of collinearity among the variables in a regression model. The Variance Inflation Factor (VIF) is 1/Tolerance, it is always greater than or equal to 1. When VIF is high there is high multicollinearity and instability of the b and beta coefficients. If the value for VIF tests exceeds 10, then there is a problem of multi-collinearity and same is the case if it is below 1. In this case, the data for VIF shows the tolerance is within the limit and is acceptable as it doesn't exceed 10 and is not even below 1. Therefore the data is free from multicollinearity.

Durbin Watson Test

Table 4.5: DW Test Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.595[a]	.587	.569	.431	2.09

a Predictors: (Constant), OMQ, KS, FiS, StAll, OMRTB, Tech

b. Dependent Variable: Firm's innovation

Source: SPSS output table.

The Durbin Watson statistic is a test for autocorrelation in a data set. The DW statistic always has a value between zero and 4.0. A value of 2.0 means there is no autocorrelation detected in the sample. Values from zero to 2.0 indicate positive autocorrelation and values

from 2.0 to 4.0 indicate negative autocorrelation. As the DW tests shows, the value for this test is 2.09, thus there is negative autocorrelation.

Model Estimation and Procedures

The second part of analysis shows how independent variables have impact on dependent variable. The first output table retrieved is model summary in which model robustness is highlighted. According to the table 4.3. the value of R=.595 indicates that almost 59 percent of dependent variable i.e. innovation at female owned SMEs is explained by knowledge management, technology, strategic alliance, firm size, owner/manager risk taking behavior and owner/manager qualification.

Table 4.6: Model Summary statistics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.595[a]	0.587	0.569	0.431

a Predictors: (Constant), OMQ, KS, FiS, StAll, OMRTB, Tech
Source: SPSS output table.

Analysis of variance is the next statistics that further indicate the model robustness and confirmation of 59 percent explanation of dependent variable. In the analysis of variance, the criteria is that value of F should be greater or equal to 5 and value of Sig should be smaller or equal to .05. According to table 4.5. the value of (F =5.014) and value of (Sig. =.000) indicate the said confirmation.

Table 4.7 Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.136	6	2.523	5.014	.000[b]
	Residual	158.418	296	0.535		
	Total	173.554	302			

a Dependent Variable: Innov
b Predictors: (Constant), OMQ, KS, FiS, StAll, OMRTB, Tech
Source: SPSS output table

Whereas, model summary and analysis of variance show the entire model goodness of fit, coefficient table effect of each independent variable on dependent variable individually. According to table 4.6. some of the variables have a significant impact on SME's innovation and some insignificant effects.

Table 4.8 Coefficient Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.631	0.346		10.506	0
	KM	0.352	0.101	0.254	3.496	0.001
	Tech	0.265	0.11	0.21	2.411	0.017
	StAll	0.117	0.083	0.115	1.41	0.16
	FiS	0.055	0.079	0.052	0.694	0.488

OMRTB	-0.01	0.106	-0.008	-0.095	0.925
OMQ	0.291	0.105	0.23	2.773	0.006

a Dependent Variable: Innov

Source: Data output from SPSS

The above table suggest that the model proposed in previous chapters of this study can be in below equation:

$$Innov= 3.631+.352(KM)+.265(Tech)+.117(StAll)+.055(FiS)-.01(OMRTB) +.291 (OMQ) + \tag{1}$$

In the twenty-first century, more attention is given to entrepreneurship through establishing small and medium enterprises. Extensive evidence shows that the performance of women-owned enterprises played pivotal roles in the development of a nation (Shakeel, Yaokuang, & Gohar, 2020) and the well-being of societies by creating jobs, wealth, and innovations (Mozumdar, Van Der Velde, & Omta, 2020). In Afghanistan, the importance of enterprises owned by women entrepreneurs is noticed on different documents like industrial policy, SME's development strategy, and the growth and transformation and developmental plans to accelerate growth and reduce poverty (Meressa, 2020). Despite this, both the growth and performance of women-owned SMEs remain a concern. However, women's entrepreneurship has gained popularity globally, with many women starting and running their businesses (Awoke, 2019). Moreover, the performance of women-owned MSEs has been persistently influenced by numerous factors; even a significant number of women's interest in business show some escalation in Afghanistan, but their success is still insignificant (Meresa, 2018).

Arriving at interpretation, table 4.7 above and Equations (1) suggest that if all independent variables are excluded from the model, the value of innovation is 3.631. while this value is not directly interpretable, one can say that innovation can exist at the SME level without any external factor influencing it. Furthermore, the value of beta, i.e., ß, suggests the degree of change in innovation due to the inclusion of one independent variable while the rest remain constant. For instance, if knowledge management is improved by 1 unit, there will be 3.52 positive changes in innovation. The criteria for statistical significance of the impact of the variable is set by standards such as t should be greater or equal to 1.96, and significant value should be smaller or equal to .05. Based on this criterion, knowledge management's impact on innovation is statistically highly substantial, as indicated by the value of (t=3.496) and value of (sig =.001).

Similarly, if technology is improved by 1 unit, innovation will improve by .265 units. This impact is also statistically significant, as shown by values of (t = 2.411) and (sig =.017). The strategic alliance also positively affects innovation demonstrated by the value of (B=.117), which means that if the strategic alliance is improved by 1 unit, innovation will improve by 11.7 units. However, this impact is statistically insignificant, indicated by the value of (t=1.41) and (sig =.16), where t is smaller than 1.96 and sig is more significant than .05. There is a positive effect of firm size on innovation as well. If the firm size is changed by 1 unit positively, the innovation will change by .055 units. However, this effect is very insignificant statistically, which is shown by the value of (t=.694) that is way smaller than 1.96, and value of (sig =.488) that is way greater than .05. on the other hand, owner/manager risk-taking behaviour has a negative effect on innovation. If owner/manager risk-taking behaviour positive change by 1 unit, innovation will deteriorate

by .01 unit. However, this effect is statistically insignificant, as indicated by the value of (t=-.095) and (sig=.925). Finally, owner/manager qualification can also positively affect innovation. For instance, if owner/manager qualification is improved by 1 unit, innovation will improve by .291. This effect is statistically significant, shown by the value of (t=2.773) and (sig=.006).

Hypothesis Test

The study formulated a number of 6 hypothesis to validate the theoretical framework. Study approve/disprove the hypothesis utilizing information of listed in the table 4.7 and report the result in table 4.8.

Table 4.9: Hypothesis Testing

#	Hypothesis	t	sig	Acceptance/rejection
1	Knowledge improvement and transfer have a significant effect on the innovative performance of SMEs.	3.496	0.001	Accepted
2	Technology can significantly and positively affect innovation performance of SMEs.	2.411	0.017	Accepted
3	Strategic alliance can significantly and positively affect innovation performance of SMEs.	1.41	0.16	Rejected
4	Firms' size can significantly influence the innovation performance of SMEs.	0.694	0.488	Rejected
5	Owner-manager risk-taking behavior significantly influence the innovation performance of SMEs	-0.095	0.925	Rejected
6	Owner-manager qualification behavior significantly influences the innovation performance of SMEs	2.773	0.006	Accepted

Source: Authors Compilation

For identifying the determinants that influence the level of innovation in women-led SMEs, firm-level data is essential to provide result-oriented and sustainable support. Concerning this, few studies have been carried in the Afghanistan context to identify determinants that influence the performance of SMEs. These include the investigations made by Holmén, Thawtarmin, and Saarelainen (2011), Jones and Tzemach (2012), and Nasri and Shams (2018), to mention a few. However, these studies discuss constraints faced by women entrepreneurs in focusing on entrepreneurial activities. In addition, these studies didn't explain the factors that influence the performance of women entrepreneurs in the country. They tried to explore the factors affecting the performance of entrepreneurial intentions and activities. Therefore, the above evidence suggests the following reasons why additional research in the area of women entrepreneurs] is needed in the context of Afghanistan in general and Kabul, particularly one of the emerging economic centres of the country. Lastly, in the context of Afghanistan, existing studies on determinants that influence the

performance of women entrepreneurs missed the main determinants of innovation. As such, this research is intended to fill this gap on the issue.

As a result, against this background, the purpose of this study was to explore the determinants of innovation that influence the performance of women entrepreneurs in SMEs in Kabul city of Afghanistan. From the hypothesis results, it can infer that knowledge improvement and transfer, technology, and owner-manager qualification behaviour significantly influence innovation performance and are regarded as the decisive determinants of innovation in women-led entrepreneurs in Afghanistan. The study's findings align with the previous studies of Awoke ([2019](#)) and Solomon ([2010](#)). As the results justify technology as a critical determinant of innovation, and the findings are at par with other studies like Hadhri et al. (2016), Yildiz et al. (2020), Laeeque et al. (2017). The second dimension relates to knowledge improvement and transfer which have conformity with the studies like Nieves and Osorio (2016), Roffeei, Yusop, and Zaman (2018), Hue (2019), and Le and Lei (2019). Owner-manager qualification behavior is also a significant dimension of innovation as suggested by this study, and the results are near the findings of Jabeen et al. (2019), Laeeque et al. (2017), and Wyll and Pippel (2016). The result shows the significance of knowledge behaviour as a critical antecedent of marketing innovation. The study recommends sound knowledge of the market before initiating any innovation.

Conclusion and Recommendations

This chapter presents the conclusion and recommendations of the study. The rest chapter is organised with section 5.1 presenting conclusion, followed by recommendations and further research in 5.2 and 5.3 sections respectively.

Conclusion

Considering that entrepreneurship is a key driver for economic growth and development, understanding which determinant variables influence the innovation of women entrepreneurs appears to be a remarkable phenomenon. In this context, this study provides new empirical evidence on determinants that influence women entrepreneurs' performance based on the data acquired from 303 women entrepreneurs in Kabul city, Afghanistan, using regression analysis. Consequently, the result of regression output revealed statistically significant evidence of three explanatory variables out of seven variables in determining innovation in women lead entrepreneurs in SMEs at 5% significance level. Therefore, knowledge improvement and transfer, technology, and owner-manager qualification behaviour significantly influence innovation performance and are regarded as the decisive determinants of innovation in women-led entrepreneurs in Afghanistan. The study's findings align with the previous studies of Awoke (2019) and Solomon (2010). As the results justify technology as a critical determinant of innovation, and the findings are at par with other studies like Hadhri et al. (2016), Yildiz et al. (2020), Laeeque et al. (2017). The second dimension relates to knowledge improvement and transfer which have conformity with the studies like Nieves and Osorio (2016), Roffeei, Yusop, and Zaman (2018), Hue (2019), and Le and Lei (2019). Owner-manager qualification behavior is also a significant dimension of innovation as suggested by this study, and the results are near the findings of Jabeen et al. (2019), Laeeque et al. (2017), and Wyll and Pippel (2016). The result shows the significance of knowledge behaviour as a critical antecedent of marketing innovation. The study recommends sound knowledge of the market before initiating any innovation. Accordingly, the regression output indicated that enterprises owned and

managed by women entrepreneurs with higher formal education experience higher performance in terms of innovation. Moreover, the study finding also revealed that technology as a determinant is a decisive dimensions affecting the innovation performance of women entrepreneurs in SMEs in Afghanistan.

Recommendations

The findings of this study, therefore, suggest that women entrepreneurs with lower impetus to innovation should take actions for better improvement of their innovation performance and their contribution for the city as well as national economy by means of creating strong information exchange with customers and scale up their experience for better performance. With regard to technology support, the government should encourage the women entrepreneurs in adopting modern technologies. In addition, providing access to resources like knowledge behaviour, and technology, which are deemed as the significant and critical antecedent of marketing innovation is the responsibility of the government. For this reason, the government should reconsider the technological policy and training strategies imparted to SMEs as long as these determinants are cardinal for business innovation.

Limitation and further implication of the study

Afghanistan is one of the developing countries that women entrepreneurs recently are increasing to participate in the business arena. However, their business growth and success were influenced by different factors. Therefore, to identify the factors that influence women entrepreneurs' innovation performance in SMEs in Afghanistan, the researcher could not found sufficient baseline literature on the determinants that influence women entrepreneurs' innovation as this can be a limitation of the research. However, there are some studies (Holmén, Tarmin and Saarelainen, 2011; Nasri and Shams, 2018; and Ali and Azimi, 2017) in Afghanistan which focus on factors affecting the entrepreneurial intentions, growth, prospects and performance of female enterprises. Therefore, lack of related literature on the issue makes it difficult to compare the present result with other similar studies in Afghanistan and the study area in particular. On the other side, even though the study has attained its objective, there are still some limitations. In this context, the study did not account for determinants like level of education, previous working experience, age, and profitability of the business. Due to frequent change in these variables, the study may not reflect the dynamics of the data, which would have influence on the conclusions. Another limitation is that the research has only consisted of 303 samples. Such number may not represent the whole population of the entrepreneurs of women led SMEs. Notwithstanding, the findings of the present study can serve as an input for further research and for policymakers in developing countries in general and the study area in particular with regard to women entrepreneurs' innovation in SMEs.

References

Adams, R., Bessant, J., & Phelps, R. (2006). Innovation management measurement: A review. *International journal of management reviews*, *8*(1), 21-47.

Adeyeye, A. D., Jegede, O. O., Oluwadare, A. J., & Aremu, F. S. (2016). Micro-level determinants of innovation: analysis of the Nigerian manufacturing sector. *Innovation and Development*, *6*(1), 1-14.

Afuah, A. (2020). Innovation management-strategies, implementation, and profits.

Ahmad, S. S., & Wani, N. U. H. (2018). Trade potential of Afghanistan against SAARC: An application of gravity model approach. *Kardan Journal of Economics and Management Sciences*, *1*(4), 1-19.

Ali, S., & Azimi, M. N. (2018). The role of female entrepreneurs in the economic development of Afghanistan. *Journal of Global Business and Technology Readings Book*, 7-25.

Avermaete, T., Viaene, J., Morgan, E. J., & Crawford, N. (2003). Determinants of innovation in small food firms. *European journal of innovation management*.

Awoke, F. (2019). Determinants of women entrepreneurs ' performance in Ethiopia (evidence from Hawassa City Administration). *European Journal of Business and Management*, *11*(22), 18–30.

Barata, J. M., & Fontainha, E. (2017). Determinants of innovation in European construction firms. *Technological and Economic Development of Economy*, *23*(6), 915-936.

Bazgar, S.& Wani, N. U. H. (2022). Enhancing Entrepreneurial Education and Self-Efficacy through Technical Vocational Education and Training- Authority of Afghanistan (TVET-AVI): Evaluation and Way Forward. *Kardan Journal of Economics and Management Sciences (KJEMS). Management*, *5*(3), 1-21. DOI: 10.31841/KJEMS.2022.121

Burhani, G., & Wani, N. U. H. (2019). Afghanistan-India Trade Linkage: Collaboration and Future Prospects. *Kardan Journal of Economics and Management Sciences*, *2*(1), 88-103.

Chandran, A. B., Wani, N. U. H., & Kumar, S. (2014). Economic Latent and Emerging Pattern of Merchandise Trade in SAARC Countries. *International Journal of Trade & Global Business Perspectives*, *3*(1), 759.

Dhami, J. K., Wani, N. U. H., & Sidana, N. (2020). Trade Potential of India against BRCS Economies: An Empirical Analysis based on Gravity Model. *Kardan Journal of Economics ad and Management Sciences*, *3*(2), 13-26.

Divisekera, S., & Nguyen, V. K. (2018). Determinants of innovation in tourism evidence from Australia. *Tourism Management*, *67*, 157-167.

Fleuren, M., Wiefferink, K., & Paulussen, T. (2004). Determinants of innovation within health care organizations: literature review and Delphi study. *International journal for quality in health care*, *16*(2), 107-123.

Grover, V., Pal, P., Bishnoi, V., & Wani, N. U. H. (2024). Artificial Intelligence Applications for Demand Forecasting and Optimization. In *Blockchain, IoT, and AI*

Technologies for Supply Chain Management: Apply Emerging Technologies to Address and Improve Supply Chain Management (pp. 107-122). Berkeley, CA: Apple Press.

Hadhri, W., Arvanitis, R., & M'Henni, H. (2016). Determinants of innovation activities in small and open economies: the Lebanese business sector. *Journal of Innovation Economics Management*, (3), 77-107.

Holmén, M., Min, T. T., & Saarelainen, E. (2011). Female entrepreneurship in Afghanistan. *Journal of Developmental Entrepreneurship*, *16*(03), 307-331.

Hotak, K., & Wani, N. U. H. (2019). Impact of Trade Liberalization on the Environment: The Case of Afghanistan. *Kardan Journal of Economics and Management Sciences*, *2*(1), 1-16.

Hue, T. T. (2019). The determinants of innovation in Vietnamese manufacturing firms: an empirical analysis using a technology–organization–environment framework. *Eurasian Business Review*, *9*(3), 247-267.

Jabeen, F., Faisal, M. N., Al Matroushi, H., & Farouk, S. (2019). Determinants of innovation decisions among Emirati female-owned small and medium enterprises. *International Journal of Gender and Entrepreneurship*.

Jones, G. G., & Tzemach, G. (2012). Kaweyan: Female Entrepreneurship and the Past and Future of Afghanistan. *Harvard Business School Entrepreneurial Management Case*, 811-823.

Kakar, M., & Wani, N. U. H. (2016). Nexus between foreign direct investment (FDI) and economic growth in Afghanistan: An econometric analysis. *Kardan Journal of Economics and Management Sciences*, *1*(2), 148-156.

Laeeque, S. H., Babar, S. F., & Ahmad, H. M. (2017). The integrative determinants of innovation performance: The role of learning organization and knowledge creation. *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, *11*(1), 167-184.

Latan, H., Jabbour, C. J. C., de Sousa Jabbour, A. B. L., de Camargo Fiorini, P., & Foropon, C. (2020). Innovative efforts of ISO 9001-certified manufacturing firms: Evidence of links between determinants of innovation, continuous innovation and firm performance. *International Journal of Production Economics*, *223*, 107526.

Le, P. B., & Lei, H. (2019). Determinants of innovation capability: the roles of transformational leadership, knowledge sharing and perceived organizational support. *Journal of knowledge management*.

Meresa, M. (2018). Factors affecting the performance of small-scale enterprise (restaurant and hotels) Inraya Azebo Wereda: The case of Mohoni, Maychew and Korem. *International Journal of Managerial Studies and Research (IJMSR)*, *6*(1), 68–92.

Meressa, H. A. (2020). Growth of micro and small scale enterprises and its driving factors: Empirical evidence from entrepreneurs in emerging region of Ethiopia. *Journal of Innovation and Entrepreneurship*, *9*(11), 1–22.

Mozumdar, L., Van Der Velde, G., & Omta, S. W. F. (2020). Determinants of the business performance of women entrepreneurs in the developing world context. *MDPI, J Multidisciplinary Scientific Journal*, *3*, 215–235.

Muram, S., & Wani, N. U. H. (2020). Linkage between International political relations and foreign direct investment: A case study of Afghanistan. *Kardan Journal of Social Sciences and Humanities*, *3*(1), 1-32.

Muram, S., & Wani, N. U. H. Nexus between International Political Relations and Foreign Direct Investment for Sustainable Trade: A Case Study of Afghanistan. *Munich Personal RePEc Archive*

Naseri, M. E., & Wani, N. U. H. (2020). Export Competitiveness of Afghanistan with Pakistan: An Economic Evaluation. *Kardan Journal of Economics and Management Sciences*, *3*(2), 1-12.

Naseri, M. E., Wani, N. U. H., & Sidana, N. (2018). Determinants of Exports in SAARC Countries: An Empirical Evaluation. *Kardan Journal of Economics and Management Sciences*, *4*(3), 38-57.

Nazary, P. W., Wani, N. U. H., & Hatam, A. K. (2020). Women in Peace Process in Afghanistan: Meaningful Participation and its Impact. *Kardan Journal of Social Sciences and Humanities*, *3*(2), 17-34.

Nieves, J., Quintana, A., & Osorio, J. (2016). Organizational knowledge and collaborative human resource practices as determinants of innovation. *Knowledge Management Research & Practice*, *14*(3), 237-245.

Pippel, G. (2018). Types of strategic allience as determinants of innovation failures. *Technology Analysis & Strategic Management*, *28*(4), 462-476.

Qazizada, Y., & Wani, N. U. H. (2020). Terrorism as a Challenge to Good Governance in Afghanistan: An Evaluation. *Kardan Journal of Social Sciences and Humanities*, *3*(2), 1-13.

Qazizada, Y., Afghan, M. W., & Wani, N. U. H. Challenges of Good Governance in Afghanistan: An Introspection for Sustainable Development. *Munich Personal RePEc Archive*

Roffeei, S. H. M., Yusop, F. D., & Kamarulzaman, Y. (2018). Determinants of Innovation Culture amongst Higher Education Students. *Turkish Online Journal of Educational Technology-TOJET*, *17*(1), 37-50.

Sadiqi, M. K., & Wani, N. U. H. (2018). Latency of Afghanistan-SAARC Merchandise Trade Relation: An Economic Evaluation. *Kardan Journal of Economics and Management Sciences*, *1*(2), 101-20.

Seenaiah, K., & Rath, B. N. (2018). Determinants of innovation in selected manufacturing firms in India: Role of R&D and exports. *Science, Technology and Society*, *23*(1), 65-84.

Shakeel, M., Yaokuang, L., & Gohar, A. (2020). Identifying the entrepreneurial success factors and the performance of women-owned businesses in Pakistan: The moderating role of national culture. *SAGE Open Journal, 1*(1), 1–17.

Shams, M. S., & Nasri, N. (2018). Factors affecting female entrepreneurial intentions in Kabul, Afghanistan. *Kardan Journal of Economics and Management Sciences*, *1*(1), 9-19.

Solomon, D. (2010). Desk review of studies conducted on women entrepreneurs in Ethiopia. Produced and distributed by the Addis Ababa Chamber of Commerce and Sectoral Associations with financial support from the Swedish Agency for International Development Cooperation, Sida, Addis Ababa, Ethiopia.

Taj, Z., & Wani, N. U. H. (2019). Evaluation of Afghanistan export performance: a constant-market-share analysis approach. *Kardan Journal of Economics and Management Sciences*, *2*(2), 16-40.

Taneja, K., & Wani, N. U. H. (2014). Economic performance of Indo-China merchandise trade: An analysis of RCA and RID approaches. *Journal of International Economics*, *5*(1), 88.

Tidd, J. (2001). Innovation management in context: environment, organization and performance. *International journal of management reviews*, *3*(3), 169-183.

Wani, N. U. H. (2018). Performance and Prospects of India's Trade Linkage With BRCS Economies. At Lovely Faculty of Business and Arts. Lovely Professional University. (PhD Thesis)http://dspace.lpu.in:8080/jspui/bitstream/123456789/4141/1/Nassir%20Ul%20Haq%20Wani%20Ph.D%20thesis.pdf

Wani, N. U. H. (2018). Trade compatibility between Afghanistan and India: An empirical evaluation. *Munich Personal RePEc Archive*

Wani, N. U. H. (2018). Trade compatibility between Afghanistan and India: An empirical evaluation. *Kardan Journal of Economics and Management Sciences*, *1*(1), 11-12.

Wani, N. U. H. (2019). Nexus between openness to trade and economic growth: an empirical investigation of Afghanistan. *South Asia Economic Journal*, *20*(2), 205-223.

Wani, N. U. H. (2022). The Trade-Conflict Nexus in SAARC Region: A Gravity Model Approach. *Kardan Journal of Social Sciences and Humanities*. 4 (2) 56-74. DOI:10.31841/KJSSH.2021.45

Wani, N. U. H. (2023). Decoding Social Media's Role in the Resurgence of the Taliban: A Literature Review. *Munich Personal RePEc Archive.*

Wani, N. U. H. (2024). Trade Potential of Afghanistan With SAARC Region and European Union: A Gravity Model Approach. In *Policy Solutions for Economic Growth in a Developing Country: Perspectives on Afghanistan's Trade and Development* (pp. 41-57). Emerald Publishing Limited.

Wani, N. U. H. Performance and Prospects of India's Trade Linkage with BRCS Economies. *Munich Personal RePEc Archive.*

Wani, N. U. H., & Dhami, D. J. K. (2016). Ecopreneurship: The reality cultured for today and tomorrow? *Munich Personal RePEc Archive*

Wani, N. U. H., & Dhami, J. K. (2013). Indo-China trade: intensity and potential for future trade. *International Journal of Enhanced Research in Management and Computer Applications*, 2319-7471.

Wani, N. U. H., & Dhami, J. K. (2014). Economic Concert, Collaboration and Prospective of Trade between India and Brazil. *Foreign Trade Review*, *49*(4), 359-372.

Wani, N. U. H., & Dhami, J. K. (2016). Indo-ASEAN Trade: A Study with Reference to Agriculture Sector. *Asian Journal of Research in Social Sciences and Humanities*, *6*(2), 1-21.

Wani, N. U. H., & Dhami, J. K. (2017). India's Trade Linkage with BRCS Economies: Trends, Patterns and Future Potentialities. *Journal of International Economics (0976-0792)*, *8*(1).

Wani, N. U. H., & Dhami, J. K. (2018). Trade Prospective of India against BRCS Economies: An Empirical Evaluation Based on RCA and RID Approaches, American Journal of Economics, 8(1): 31-46, doi:10.5923/j.economics.20180801.06

Wani, N. U. H., & Dhami, J. K. (2021). An empirical investigation of the effects of health and education on income distribution and poverty in SAARC Countries. *Kardan Journal of Economics and Management Sciences*, *4*(3), 1-15.

Wani, N. U. H., & Hatam, A. K. (2022). Afghanistan's Regulatory Business Environment: Exploring the Impact on Trade. *Munich Personal RePEc Archive*

Wani, N. U. H., & Kabir, H. (2016). An evaluation of the relationship between public debt and economic growth: A study of Afghanistan.

Wani, N. U. H., & Latif, L. (2022). India's Security Strategy in South Asia: Visualizing Afghanistan's Past, Present, and Future. *Kardan Journal of Social Sciences and Humanities,(2022)*, *5*(2), 11-25.

Wani, N. U. H., & Latif, L. (2022). India's Security Strategy in South Asia: Visualizing Afghanistan's Past, Present, and Future. *Kardan Journal of Social Sciences and Humanities,(2022)*, *5*(2), 11-25.

Wani, N. U. H., & Rasa, M. M. (2023). Dynamics of Trade Specialization and Performance of SAFTA: A Case Study of Afghanistan. *South Asia Economic Journal*, *24*(2), 153-179.

Wani, N. U. H., Dhami, J. K., & Rehman, A. U. (2016). The determinants of India's imports: a gravity model approach.

Wani, N. U. H., Dhami, J. K., & Sidana, N. (2020). Indo-Russia Trade: An Evaluation of Symmetry, Complementarity, Intensity and Similarity. *Kardan Journal of Economics and Management Sciences*, *3*(1), 14.

Wani, N. U. H., Khan, F. N., & Paruthi, R. (2022). International Trade in Services and FDI: A Review and Bibliometric Analysis (2000-2020). *Management*, *5*(1), 1-14.

Wani, N. U. H., Mir, A. S., & Dhami, J. K. (2013). The experience and future potentialities of BRICS as a trading bloc. *Asian Journal of Research in Business Economics and Management*, *3*(7), 271-289.

Wani, N. U. H., Rahman, A., Grover, V., Mirzakhidova, S., & Mirwais Rasa, M. (2024). Regional trade expansion opportunities in Central and South Asia: exploring trade complementarity, diversification and similarity. *Cogent Economics & Finance*, 12(1). https://doi.org/10.1080/23322039.2024.2363461

Wani, N. U. H., Taneja, K., & Adlakha, N. (2013). India and Pakistan: Economic Recital, Collaboration and Prospective of Trade. *International Journal of Trade & Global Business Perspectives*, *2*(2), 412.

Wani, N.H., Dhami, J.K., and Sidana, N. (2022), Impact of education on poverty alleviation in Afghanistan: An empirical evaluation, Kardan Journal of Social Sciences and Humanities, 5 (1), 1-14. DOI: 10.31841/KJSSH.2022.47

Wani, N.U., Khan, F.N. & Naderi, F. Electricity consumption and economic growth nexus in Afghanistan: impact, causality, projections, and policy implications. *SN Bus Econ* 4, 113 (2024). https://doi.org/10.1007/s43546-024-00671-0

Wani, N.U.H. (2024), "Drivers of Export Supply in SAARC: Investigating the Cross Evidence From Afghanistan", *Policy Solutions for Economic Growth in a Developing Country*, Emerald Publishing Limited, Leeds, pp. 61-82. https://doi.org/10.1108/978-1-83753-430-220241004

Wani, N.U.H. (2024), "Impact of Non-Tariff Measures on Trade Within the SAARC Region: An Empirical Investigation of Afghanistan", *Policy Solutions for Economic Growth in a Developing Country*, Emerald Publishing Limited, Leeds, pp. 181-200. https://doi.org/10.1108/978-1-83753-430-220241009

Wani, N.U.H. (2024), "Incidence of Reverse Capital Flight to Afghanistan: An Empirical Examination", *Policy Solutions for Economic Growth in a Developing Country*, Emerald Publishing Limited, Leeds, pp. 131-154. https://doi.org/10.1108/978-1-83753-430-220241007

Wani, N.U.H. (2024), Afghanistan's Regional and Bilateral Free Trade Agreements: An Evaluation of Trade Effects, Diversion and Creation, *Policy Solutions for Economic Growth*

in a Developing Country, Emerald Publishing Limited, Leeds, pp. 155-179. https://doi.org/10.1108/978-1-83753-430-220241008

Wani, N.U.H. (2024), Afghanistan's Regional Integration With Central Asia: Identifying Trade Linkages, Economic Recital and Future Latency, *Policy Solutions for Economic Growth in a Developing Country*, Emerald Publishing Limited, Leeds, pp. 13-39. https://doi.org/10.1108/978-1-83753-430-220241002

Wani, N.U.H. (2024), Export Diversification in ASEAN and SAARC Regions: Exploring Trends Patterns and Determinants Through Empirical Investigation, *Policy Solutions for Economic Growth in a Developing Country*, Emerald Publishing Limited, Leeds, pp. 83-103. https://doi.org/10.1108/978-1-83753-430-220241005

Wani, N.U.H. (2024), Glossary of Afghan Expressions, *Policy Solutions for Economic Growth in a Developing Country*, Emerald Publishing Limited, Leeds, pp. 201-201. https://doi.org/10.1108/978-1-83753-430-220241016

Wani, N.U.H. (2024), Index, *Policy Solutions for Economic Growth in a Developing Country*, Emerald Publishing Limited, Leeds, pp. 203-209. https://doi.org/10.1108/978-1-83753-430-220241010

Wani, N.U.H. (2024), Introduction to the Book, *Policy Solutions for Economic Growth in a Developing Country*, Emerald Publishing Limited, Leeds, pp. 3-9. https://doi.org/10.1108/978-1-83753-430-220241001

Wani, N.U.H. (2024), Prelims, *Policy Solutions for Economic Growth in a Developing Country*, Emerald Publishing Limited, Leeds, pp. i-xxii. https://doi.org/10.1108/978-1-83753-430-220241011

Wani, N.U.H. (2024), Trade Costs of Afghanistan With Its Major Trading Partners: Measurement and Its Determinants, *Policy Solutions for Economic Growth in a Developing Country*, Emerald Publishing Limited, Leeds, pp. 105-127. https://doi.org/10.1108/978-1-83753-430-220241006

Wani, N.U.H. (2024), Trade Potential of Afghanistan With SAARC Region and European Union: A Gravity Model Approach, *Policy Solutions for Economic Growth in a Developing Country*, Emerald Publishing Limited, Leeds, pp. 41-57. https://doi.org/10.1108/978-1-83753-430-220241003

Wani, N.U.H. and Rasa, M.M. (2024), Mapping trade opportunities in Central and South Asia: an exploration through trade indices and metrics, *Competitiveness Review*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/CR-02-2024-0023

Wani, N.U.H., (2018). Terrorism and foreign direct investment: An empirical analysis of Afghanistan. *Kardan Journal of Economics and Management Sciences*, *1*(3), 40-59.

Wani, N.U.H., Dhami, J.K., and Sidana, N. (2022), Impact of education on poverty alleviation in Afghanistan: An empirical evaluation, Kardan Journal of Social Sciences and Humanities, 5 (1), 1-14. DOI:10.31841/KJSSH.2022.47

Wani, N.U.H., Majidi, B.S., Sidana, N. and Goel, R. (2024), *Self-Help Groups in Afghanistan: A Ploy of Economic and Social Empowerment of Women for Sustainable Development*, Goel, R., Singh, T., Rahman, M.M., Islam, Q.T. and Baral, S.K. (Ed.) *Understanding the Multi-Dimensional Nature of Poverty*, Emerald Publishing Limited, Leeds, pp. 147-170. https://doi.org/10.1108/978-1-83753-292-620241008

Wyll, H., & Pippel, G. (2016). Types of cooperation partners as determinants of innovation failures. *Technology Analysis & Strategic Management*, *28*(4), 462-476.

Yama, M., & Wani, N. U. H. (2021). Nexus between export diversification and economic growth: A case study of Afghanistan. Kardan Journal of Economics and Management Sciences 4 (1) 1–24, 10.31841/KJEMS.2021.8 https://kardan.edu.af/Research/CurrentIss

Yildiz, H. E., Murtic, A., Klofsten, M., Zander, U., & Richtnér, A. (2020). Individual and contextual determinants of innovation performance: A micro-foundations perspective. *Technovation*, 102130.

Appendix A- Questionnaire

Please answer the question on scale of 1-5 where 1 is strongly disagree and 5 is strongly agree

Variable	Indicators	1	2	3	4	5
Innovation	Enterprise introduced new product in terms of functionality and feature and usability					
	Enterprise introduced new process in terms of functionality and feature and usability					
	Enterprise developed new products, changed the design of established products					
	Enterprise created new products or improved versions of existing products that increase their uses.					
	Enterprise used new materials or components in the manufacture of established product					
Knowledge Management	Enterprise validate and prioritize concepts through concept testing					
	Enterprise made comparison and move forward with the concept and ideas that perform at the top.					
	Enterprise determines the concept(s) that may be the most profitable based on the assessment the market by using a customer segmentation process.					
	Enterprise refined of the concept by developing a prototype to put into a formal product development process and incorporate user testing to iterate further					
Technology	Innovation was possible because of availability of technological infrastructure.					
	Acquisition of new machinery makes innovation possible.					
	Use of technology such as website enabled enterprise come up with innovative marketing strategy.					
	Use of information communication technology smoothen product and process innovation and development.					
Strategic Alliance	Enterprise partnership with universities led to innovation.					
	Enterprise public engagement enabled enterprise to innovate					
	Enterprise close relations with retailers made innovation possible.					
	Enterprise relation with suppliers made innovation possible.					
Firm size	Firm's asset is a reason behind innovation					
	Firm's number of employees is a reason behind innovation					

Owner/manager risk taking behavior	Owner/Manager is not risk averse					
	Owner/Manager accepts taking risk when new opportunity arises.					
	Owner/Manager accept risk of entering in new information					
Owner/manager qualification	Owner/Manager is has a high qualification					
	Owner/Manager is overseas educated					
Owner/manager technical expertise	Owner/Manager is an engineer					
	Owner/Manager is a computer scientist					
	Owner/Manager has high technical expertise					