The Main Determinants of Innovation and Export Complexity

Nazrin Shahmamedova

MBA34 (ADA FT 1)

MSM | MAASTRICHT SCHOOL OF MANAGEMENT

Table of Contents

1.Abstract

Economic growth and development require greater access to the international market while developing countries face difficulties in terms of improving their indicators of economic complexity and innovation which is the necessity for reaching global markets. The purpose of this study was to investigate the factors which influence the economic complexity and innovation and the role of gender diversity in the relationship between ease of doing business and innovation. For testing the hypotheses, the secondary data provided by the global organization, the sample of 63 countries, and multiple regression analyses were used. The results confirm that ease of doing business positively affects innovation and the complexity of exports of a particular country. In addition, innovation also has a positive significant effect on the complexity of exports. Findings also revealed that gender diversity moderates the relationship between ease of doing business and innovation. In other words, ease of doing business has a greater influence on innovation when the workforce of the country is more balanced in the number of males and females. This study contributes to a better understanding of the factors that explain how human capital can be translated into greater county-level achievement. Thus, promoting entrepreneurship and gender equality must be in the center of governmental policies to be able to achieve long term sustainable growth and development.

2.Introduction

Innovation is inevitably important for human development. Since the 17th-century successful technological revolutions have resulted in the introduction of new goods and services, with its tremendous influence on the welfare of society. But unfortunately, these innovations are not available to all societies and there are still countries that lack innovations in fundamental areas such as medicines, ICTs, and so on (Papaioannou, 2011). In the literature, innovation was recognized as a driver of productivity, differentiation, efficiency, competitive advantage, and other positive outcomes (Dameri, Garelli & Resta, 2015).

Moreover, innovation has a positive impact on the exports, since the export potential of the country is also considered the result of innovation (Papaioannou, 2011). Many empirical researches support the Schumpeterian theories that innovation is the main driver of export activities (Ebling & Janz, 2003). There is a

simultaneous relationship between exports and innovation, and innovation in terms of technological advancements positively impacts exports. (Hughes, 1986).

The innovation level of the country is heavily reliant on the innovations of individual firms which constitute the major part of the economy and play an important role in growth. Nowadays SMEs play a central role in the economic development of the country. They contribute to the overall economy through the changes in the business sector, by their ability to respond to the emerging technologies and competitiveness conditions instantly and quickly, along with contributing to the innovation level of the country. Successful product innovation is associated with the decisions of SMEs to enter the export market, and it can affect exports directly or through its effect on firms' productivity which increases the likelihood that a firm will enter an export market (Golovko & Cassiman, 2010). Researches show that for both developed and developing counties expansion of exports is associated with enhanced economic performance and increased productivity (Kavoussi, 1984). One of the classifications of exports is economic complexity which refers to the production of knowledge-based products and the diversification of exported goods by the country. By economic complexity, the emphasis is on the intense application of technical knowledge in product diversification to encompass it in the domestic consumer markets on the one hand and foreign markets on the other. (Lall, Weiss & Zhang, 2006). The term of economic complexity was introduced by Hidalago, Barabassi & Haussman (2007). They examined the networks of communication between products and concluded that publicly used and simple products that do not require much skills and knowledge are produced by countries with low complexity and are less competitive globally.

Therefore, the more diverse and the more sophisticated the country's export basket is the more powerful is it in economic terms and at the international level. Hidalgo (2015) stated that not only the extent to which every nation enjoys the production of knowledge at present is important but also the extent to which the society, in general, is more committed to the use of aggregated knowledge. The development of individual societies depends on their abilities to use collective and shared knowledge. It is a necessity for societies to broaden their activities in the network of active members, through providing the opportunities to share the common knowledge with the universe.

Based on the fact that less developed countries suffer from exporting only primary products and face export instability, researchers claim that the composition of the country's export basket has a significant effect on its growth (Glezakos, 1973). Currently, the countries of Middle East, North Africa and countries the export basket of which consists mainly of oil production face substantial losses due to the sharp decrease in oil prices because of the coronavirus pandemic (COVID-19) (World Bank, 2020) as well as countries which are reliant on tourism and are service-oriented (Fernandes, 2020). This negative effect emphasizes the importance of the flexible rather than fixed economy which creates an economy with a sustainable cycle in which industries feed off each other on a continuous base and grow more as economies grow (Hales, 2016).

Globalization and international trade have made a global market a highly competitive environment and to survive in this fierce competition and be able to achieve a long-term sustainable growth rate country must make emphasize factors such as innovation and complexity of exports. This research aims to provide evidence on the factors which influence the innovation level and economic complexity of the global nations with an emphasis on gender diversity and entrepreneurship. The analysis will be done including a sample of 63 countries. Conducting the research on the global scale will help to identify the main macroeconomic drivers of innovation and complexity of exports as well as considering the various factors which may vary from country to country. This research aims to contribute to the three branches of the existing literature: (1) the literature on exports in terms of economic complexity, (2) the literature on entrepreneurship, in terms new venture creation and its effect on macroeconomic variables (3) the literature on the gender diversity and its positive effect on the innovation.

To develop this study the following section presents the review of the literature and hypotheses. The next section is dedicated to the methodology used and data analysis. Finally, the research findings are discussed as well as the theoretical, practical contributions, limitations, future research proposals, and conclusion of the study.

3.Literature review

3.1. Ease of doing business

Ease of doing business is an aggregate figure which includes several parameters and defines the ease of doing business in a country (The Economic Times). When it is easier to do business in a country entrepreneurs

get more access to better opportunities which creates a competitive environment, increases employment, and decreases the threat of corruption (Kuriyama, 2020). Canare (2018) analyzed the impact of ease of doing business on company creation and found the positive relationship between these two variables using the data from 120 countries. The strongest elements contributing to the creation of companies are the starting business and paying taxes components.

With the continuously growing number of SMEs, the ease of doing business plays a more important role in the county's economic growth. Ease of doing business has implications for both FDI and local entities since they are also impacted by the rules and regulations set up by governments which may help achieve a business-friendly environment or hold organizations back from their entrepreneurial spirits. When there is a business-friendly environment in the country set up a business becomes easier not only for large companies but also for small companies that have a small amount of capital and resources. Society as a whole can benefit from the ease of doing business by having access to economic opportunities, decreased transaction costs, and a decrease in corruption (Friedrich Nauman Stiftung, 2017).

Entrepreneurs benefit from unrestricted and free entry into the market but once they become successful businesses they have a time-inconsistent motivation to lobby for government entry restrictions. Wrong political institutions lead to those demands and increasing barriers are set on domestic as well as on international competition. Productive entrepreneurship is the result of freedom to succeed and discipline of failure which free market provides. Barriers to trade lead to fewer combinations of inputs and goods and decrease the productive resource usage by entrepreneurs (Russell, Sobel, Clark & Dwight, 2007). Improved ease of doing business index results from a country changes in the business environment since it affects both domestic and international markets. For example, improved ease of doing business index can attract foreign direct investment which will increase competition in the domestic market. With regard to this, the aim of societies must be to satisfy the theoretical models of rivalry and competition. The ideal outcomes for the nations would be competition or monopolistic competition with the large entry (Karama & Dalal, 2014). High barriers to entry lead to monopoly, or in some cases oligopoly (OpenStax, 2016). Monopolies result in the inefficient use of resources and reduction in the overall economic welfare (Ferguson & Ferguson, 1994). One of the reasons why monopolies decrease the innovation of the country is that adopting new technologies is usually one of the major

problems for companies since their adoption requires a temporary reduction in the output level which is named switchover disruption. The cost of adopting new technologies is the loss associated with the sales of delayed or lost production and these costs are higher the larger the price of those units (Holmes, Levine & Schmitz, 2012).

3.2. The role of the government regulations

The business regulation laws have a significant impact on company growth entry and exit along with profitability and productivity. Limited resources like capital and labor are challenged to be used in the most efficient way to produce better results. High entry barriers can prevent the allocation of resources in the right way by harming the growth of efficient companies and allowing them to dominate the market by inefficient ones. This will ruin the Schumpeterian process of creative destruction which is an important element of productivity and innovation (European Commission, 2016).

The entrepreneurship environment consists of several elements like culture, leadership, customers, and capital markets which combine in complex ways. None of this element can sustain entrepreneurship alone. This is the main mistake of many governments since they address only one or two of these elements. Natural resources are also one of the elements of competitive advantage of the country however they are not always the key element of the entrepreneurial environment. Usually, entrepreneurship is stimulated in countries where such resources are scarce because people become more inventive. Governments cannot build the entrepreneurship ecosystem alone. The only private sector has the perspective and motivation to develop a profit-driven and self-sustaining markets. For this reason, governments must stimulate the private sector at an early stage and let it acquire and keep a reasonable share in the success of the economy. One way to do this is to reduce structural barriers and formulate business-friendly programs and policies (Isenberg, 2010).

The relationship between entrepreneurship and economy is and will be strong since entrepreneurship is important for the growth and development of the country, especially for countries with low economic development (Manuel, 2006). The rate of new company formation is crucial for the least developed countries and most of the policies created to increase entrepreneurial activities have disappointing results. Moreover, institutional reforms that are aimed for the maintenance of stable and transparent institutional frameworks which is linked to entrepreneurship is the best task for entrepreneurial policy (Davidsson, 2020).

The research done by Thurik & Wennekers (2004) identified that both small business and entrepreneurship are important separately and in some cases, these two concepts overlap. They concluded that the central role of the government is to enable entrepreneurial activities because entrepreneurship on its own is a driver of growth, competition, and job creation.

Creating a business-friendly environment in the country is important for the formation of small and medium-sized enterprises which play a central role in the growth of the country. SMEs are entities that help the economy to stay on the float during times of crisis and while globalization helps these companies to have access to the global arena it also increases the competition level and forces companies to advance technologically and grow. The business-friendly environment can be created through government actions which will ensure equality in the market, security and enforcement of contracts, attractive tax, credit, custom policies, provision of legal and economic infrastructure to increase entrepreneurship and innovation which are keys to development and by using it power government must provide opportunities for new businesses and investors (Bytyci, 2015).

The performance of the organization is highly dependent on the different types of reforms among which are competition, management of the companies, pay incentives, increase in profit retention rates, and the increase in the manager's scopes of responsibilities to making the production-related decisions and determining the level of wages.

Government regulations are necessary not only for the protection of the organizations, but they carry great importance for the consumers as well. Consumers are usually less informed than producers or may face difficulties when buying sophisticated products like technology or pharmaceutical drugs, and for addressing this issues consumer protection laws must be enforced. Also, it is a common practice in many countries when a certain industry is dominated by a few sellers who can set the market price of a good on the desired level, and anti-monopoly laws are required to avoid consumers paying higher than fair price. Social costs are another problem that requires government regulations since societies are exposed to discrimination, environmental pollution, and other damages. Consistent with these results it can be claimed that market regulation laws are an important determinant of the societies welfare and development (Xu, 2003).

3.3. Entrepreneurship and competition

Entrepreneurship results in the exploration of new ways to do business and leads to competition (Matusik, 2016) which is defined as the situation in which one party is trying to be more successful or win another party (Cambridge Dictionary). In business, competition is the rivalry between organizations within the same industries the purpose of this is to capture more market share, earn more revenue, or create a sustainable brand image (Ali, 2020). The competition level of the society can also be a function of culture that is, some societies raise their children on the worldview of cooperation that is in some context opposite to competition. Competition in this society is associated with aggressiveness and contradicts the objective of an affiliative and peaceful society (Bonta & Bruce, 1997). Studies suggest that individualistic cultures tend to be more competitive rather than collectivist (Leibbrandt, Gneezy, & List, 2013). Competition plays important role in the development of countries by facilitating the equal opportunity to all members of the society although there are many anti-competition policies especially in developing countries that are created by governments or organizations (Godfrey, 2008). One example is corruption and oligopolistic markets and

Emerson (2006) identified that there is a negative relationship between the corruption of government officials and competition that arises from controlling the number of companies operating in a certain sector and that is an unethical practice against the competition. In microeconomics, there is a concept of perfect competition which is the state of the economy that achieves the maximum benefit for the society but in the real world, the perfect competition doesn't exist instead there is a monopolistic competition that is close to it (Thampapillai, 2010). Adam Smith's (1776) theorem of the invisible hand is underlying two assumptions that are the decentralization of the political and economic system and that the competition is based on price. However, there are also other types of "nonprice" competition such as research and development, advertising, competition for monopoly, and corporate growth. Mehralian & Shabaninejad (2014) argue that competition is the key success factor for the countries and companies, that helps to attain a competitive advantage which is the differentiating characteristic of one company or country from others and the factor which is needed to achieve long term sustainable growth and survival. The availability of many companies in one sector increases the number of employment positions which in turn increases the welfare of the society. The competition also benefits consumers by providing lower prices and better quality. Moreover, the countries that have a sustainable competitive environment attract foreign investments (United Nations Conference on Trade and Development).

3.4. Innovation

Innovation is the process of modifying the existing product or process by adding new elements and features or creating a completely new product or process that will also create new value for the users of it (O'Sullivan & Dooley, 2009). The innovation can be called everything from creating a sophisticated product like a 3D printer to the modification to simple products or everyday activities like turning the bottle of the ketchup upside down. For innovation to be meaningful it must be creating the new value and meet the unmet needs of the customers (Greenwald, 2014). Over the past decades, innovation became an important way of avoiding social threats and risks like problems of global warming, growth of the population, scarce resource, natural disasters. And innovation is one way of resolving such issues and strengthening society's capacity to act. It acts as a mechanism of resolving the collective problems efficiently and sustainably, typically with the use of new technology. For increasing the levels of innovation public, private, and nonprofit sectors must be involved (Kylliäinen, 2019).

In the economy, innovation is defined as the process of application of ideas and technologies which improve products and services or increase the efficiency of the production process. In recent years IT changed the way organizations produce and sell their goods and services while exploring new markets and business models. One of the main benefits of innovation is its contribution to economic growth. It leads to higher productivity, through generating more output with the same amount of input and this leads to the increase in the number of goods and services produced and consequently economic growth (European Central Bank, 2017).

Merigó, Cancino, Coronado & Urbano (2016) analyzed the innovation research level of the countries from an academic perspective from the year 1989 to 2013 and concluded that publications done in this area are biased towards the country of origin of the journal. Moreover, research revealed that the USA and UK are the leading countries in the field of academic research on innovation.

3.5. Organizational level innovation

Workplace innovation is crucial because it allows the companies to penetrate the markets quicker and provides better connections to developing markets which can result in better opportunities, especially in developed countries. It can also help in developing the original concepts while providing the inventor with a

confident and proactive attitude to take risks. Those companies the culture of which supports innovation will grow faster despite the fact that innovative processes are not always simple and fast. Tried and tested methods are more reliable but exploring new things is always a worthwhile experiment (Henderson, 2017).

Innovation is a necessary condition for the development and growth of organizations although it is usually followed by some degree of uncertainty and risk (Boer & During, 2001). There is a significant difference between the risk aversion of managers and entrepreneurs meaning that managers are less likely to take risks, which is one of the leading components of innovation. (Tan, 2001). Studies suggest that small companies are more flexible, innovative and chances of survival in an ambiguous environment are higher. In today's business environment those organizations which want to remain competitive must be innovative an innovation is not only modifying or adding new features to existing products but also an invention and producing the products which were not previously produced (Afuah,2009).

According to O'Sullivan (2008), the drivers of innovation are new technologies, competitors, ideas that can be derived from customers, partners, and changes in the external environment. Nowadays for organizations innovation is something more than just allocating the part of the budget to the R&D department because the boarders of innovation are spread beyond this department and can it can take part in any department or at any hierarchical level of the organization (Dearlove & Crainer, n.d.). Because of globalization and rapid economic and technological changes in the world managers of the organization face the situations with which the managers of previous decades haven't faced. These changes can be similar across countries, industries, and organizations over time. So, the change on its own and the characteristics of the environment can be unique but the effect that it has on organizations and managers is not (Tushman & O'Reilly, 2002).

3.6. Knowledge spillover theory of entrepreneurship

Ease of doing business fosters entrepreneurship which is a closely related term to innovation and a considerable number of studies and theories exist which explain the positive relationship between them. Entrepreneurship is an important element for the functioning of the economy because it leads to the growth of productivity, production, and commercialization of innovation (Praag & Versloot, 2007). Entrepreneurial companies have many positive spillovers for not only for domestic economy but also for the regional economy

by influencing the employment rates of all firms in the region in the long run along with accounting for high GDP, less volatile labor market, increased number of innovation and a more important role in the adoption of innovations (van Praag et al., 2007).

According to the knowledge spillover theory of entrepreneurship, an individual's decision to become an entrepreneur can be influenced by the context from which decision making is derived (Acs, Audretsch & Lehmann, 2013). Particularly, the context which is rich with knowledge can generate new entrepreneurial opportunities from these ideas. John Foster and Stan J. Metcalfe (2009) highlight the importance of adopting the views of the complex system, the main element of which is the transmission and creation of new knowledge for the foundation of new economic modeling. Entrepreneurship turns knowledge into new to the market innovation and supports the importance of Schumpeterian entrepreneurship in the process of knowledge commercialization (Block, Thurik & Zhou, 2012). The entrepreneur serves not only as a means by which knowledge is spillover, but also ensures the enhanced economic performance and innovative activity. The knowledge spillover theory of entrepreneurship combines the contemporary thoughts and theories of entrepreneurship along with universal theories of strategy, economic growth, geography and explains not only why individuals chose to become entrepreneurs but also why it is such of importance for society and economy (Acs, Audretsch & Lehmann, 2013).

3.7. The effect of entrepreneurship in innovation through competition

Entrepreneurship is characterized by risk-taking and innovation and is an inevitable part of the societies success in the competitive environment (Bytyci, 2015). It has a competitive nature (Kirzner, 1973 and Schumpeter, 1934; as cited Urbig, Bönte, Procter & Sandro Lombardo). The level of competition in the country is determined by the number of companies operating in the same sector and overall, in the economy, the more operating companies the higher and more intense the competition. The easer is the procedure for beginning the business the more new startups would emerge in the economy, considering other factors as well (Doing Business, 2020).

Innovation is very sensitive to competition (Lamoen, 2011). Competition enhances better performance which in turn can lead to innovation. In the long-run gains from reforms enhancing competition will exceed the

static gains in the short run because companies will continue to innovate, they would not do otherwise. "dynamically competitive" industries are more likely to be efficient than "non dynamically competitive" industries (Ahn, 2002). When companies decide whether to implement the innovation or not they rely on some factors and the study done by Ozer & Acikdilli (2012) with the sample of small and medium-sized firms in machinery sector found that during the adoption of innovation companies take into consideration competition, environment, characteristics of innovation and marketing strategy but usually they avoid the characteristics of own firms.

The European region was the part of the world that first experienced a sustainable growths and this was explained by the existence of political competition in European countries. The result of political competition was an increase in the innovation level of the country that certainly leads to growth (Chaudhry & Garner, 2006). Philippe Aghion and Rachel Griffith (2008) point a contradictory view about competition and growth, on one hand, the models of industrial organizations and new development economies predict the negative relationship between competition and innovation because competition decreases monopoly rents which appraise successful innovations. But on the other hand, common sense and empirical studies found that competition positively affects innovation and productivity growth. Cornaggia, Xuan, Tian & Wolfe (2015) found that competition in the banking sector affects positively small and innovative companies to secure their financing by banks rather than being acquired by big corporations. Aghion, Bechtold, Cassar, & Herz (2014) analyzed the impact of competition on innovation by the laboratory experiment among the companies that operate in a similar sector and came to the conclusion that competition increases the amount of investment by neck and neck companies. Moreover, more competition decreases the number of sectors in which companies are operating the neck and neck. The study done in the telecommunication sector of Kenya by Kaunyangi (2014) analyzed the performance of four firms and identified that competition has a positive impact on the performance of all four companies. Low barriers to entry into this sector increase the number of buyers and consequently the competition level also increases. The research done by Moen, Tvedten & Wold (2018) among 380 Norwegian SMEs found the positive relationship between competition and most of the innovation indicators such as product, service, and process exploration. Castellacci (2010) analyzed the impact of competition on four different measures- labor productivity, innovation output, the intensity of R&D, and the

company engagement level in innovation. The results showed that in oligopolistic competitions are more likely to engage in innovative actions and increase the spending on R&D. Companies in competitive sectors have more impact of innovation on economic and technological performance.

3.8. The importance of market regulation laws for entrepreneurship and innovation

Galindo & Méndez (2014) analyzed the relationship between GDP, entrepreneurship, and innovation found that monetary policy and social climate has a positive impact on entrepreneurship. Moreover, economic activity promotes innovation and entrepreneurship, and the later facilitates economic activity. Fried (2016) argues that laws regulating market functioning must be in the center of government policies that aim to achieve a sustainable growth rate. Anticompetitive actions such as import restrictions on certain products that are produced domestically, monopolization in industries, and government-owned sectors are undermining the advantages such as innovation that healthy competition would bring. Encaoua & Hollander (2007) investigated the effects of intellectual property protection laws on the competition and revealed that IP rights decrease the competitiveness in certain sectors such as software markets because of the difficulties associated with building upon the previous patented software. Weaker protection of IP rights enhances competition and innovation, although they are followed by some degree of unfairness to the owners of IP.

The review of the literature shows that a business-friendly environment facilitates entrepreneurial activities which increases market competition. Competition in turn facilitates innovation and efficiency. Based on the existing theories and empirical studies conducted on the relationship between entrepreneurship, competition and innovation and considering the fact that there are no existing studies which analyzed the effect of ease of doing business on the innovation level of the county I came to the conclusion that ease of doing the business level of a country positively affects its innovation level.

H1: Ease of doing business positively affects innovation

3.9.Gender: Key differences between male and female

When we say gender the first opinion that comes to our mind is the biological difference between two representatives of this concept. But more broadly gender can be defined as the roles and the responsibilities that the society has assigned to males and females, and that has been formed for the centuries. Like everything in the world the understanding, positions in the society, and attitudes toward gender are also varied across countries and cultures and even this variation can be extended to the variation between the groups of people within the same culture or country (Rose, 2010).

Gender differences can be seen in many aspects of our lives and even in the reaction to the same diseases, that biologically occur the same way and have the same symptoms, such as depression can have a different impact on men and women. The cross-national research done by Salk, Hyde & Abramson (2017) found that more gender differences, surprisingly, occur in the countries with greater gender equality. Many studies have been done to identify the differences between two genders and one of them that was conducted among 320 university graduates and found that males performed better in most of the knowledge-based determinants such as abilities, personal traits, and motivational factors across technical and humanitarian sciences (Ackerman, Bowen, Beier, & Kanfer, 2001). Males and females differ not only by their relative level of knowledge, skills, and abilities but also by their personal characteristics. Archer &

Waterman (2010) revealed that females differ in their way of social interdependency that means that females tend to be more dependent while males prefer more independence. Gino and Brooks (2015) argue that males are more motivated by power rather than women for whom management positions are less attractive and this explains why the majority of executive positions are held by males and that the priorities in the life of both genders differ.

For becoming a business owner both females and males have some motives and they can be both economic and noneconomic motives. Females, as well as males, are also primarily motivated by achievements, autonomy, and desire for job satisfaction. Meanwhile, the desire to earn money is also an important factor. But females are less concerned with making money than males and their primary motive for becoming a businesswoman is career dissatisfaction. Moreover, for females, entrepreneurship is considered a way of meeting their own needs and needs of their children (Cromie, 1987).

There are differences between the perception of competition of males and females, and they respond differently to the competitive environment. The study was done by Kivikangas, Kätsyri, Järvelä, & Ravaja (2014) found that males prefer competition over cooperation and are more motivated and successful under competitive pressures. While females are indifferent between competition and cooperation, meaning that they can work under both circumstances. Differences were found also in the decision to enter the competition more males than females preferred to enter the competition when they had to compete against each other. Moreover, further research found that females prefer to enter into the competition when they are sure that the environment in which they compete is gender tolerant and there is an equal representation of females (Niederle & Vesterlund, 2008).

Gender plays an important role and can be a moderator in different situations of our everyday life. For example, Lin, Featherman & Sarker, (2016) analyzed the impact of the gender of the continuance of usage of social networking sites and came to the conclusion that the elements on the basis of which males and females make decisions and their relative weights vary by gender.

3.10. The problem of gender gap and attempts of governments to eliminate it

In many cultures, males are considered the dominating gender and have more physical and moral power over the opposite gender (Muller & Wrangham, 2009). The differences associated with gender has a more negative impact on women than men. Although there are many laws and policies promoting gender equity and prohibiting discriminatory behavior against females there is still a gap between males and females in many aspects of social and economic life. Especially this is true for developing and low-income countries (OECD, 2015). For example, the in the African and some Asian countries agricultural sector suffers because women who are one of the most important success determinants of this sector are facing constraints like the lack of ownership of important for assets and services that are required for the effective operation of this sector (SOFA Team, 2011). Furthermore, women-owned enterprises face is limited access to capital, networks, and credits which are essential for effective competition (United Nations Inter-Agency Network on Women and Gender Equality, 2011). Although females and males have similar expectations about rewards they will derive from business ownership, females still face gender-related problems. Hubbard and Bytes (2017) claim that

monopolistic and oligopolistic markets and gender inequality are interconnected. That is the aim of a monopoly is to exclude smaller companies just like the aim of gender inequality is to exclude less powerful opposite gender-females from the workforce. When there are only a few firms in one sector the employee mobility decreases and this situation hurts females more than males. Johannes Laitenberger (2017) argues that enforcement of competitive and antimonopoly laws will resolve issues like inequality, fairness, and innovation.

Competition and gender equality are parts of the reforms done in many countries. For example, India has gone a long way of reforms and policies to promote market competition, growth, innovation, and currently is one of the fastest-growing economies in the world. But at the same time, the gender gap in India is larger than in other developing countries and it is forecasted that competition will lower the discriminatory policies away in order to get the benefits of gender diversity for development (Ghani, Goswami, Kerr & Kerr, 2017). In some of the European countries that are characterized by highly competitive markets, investors require to include a certain percentage of females in the corporate board with the purpose of increasing the performance and innovation (Trager, 2019).

3.11. Gender diversity and innovation

Globalization and increased liberalization of worldwide trade make the word a highly competitive environment in which the members of this competition are forced to innovate and differentiate to gain competitive advantage. The primary objective of the companies is to create new ideas and offer products that will appeal to the customers more than those of rival companies and the right innovation management system is one way to archive this objective (Dereli, 2015). A possible way of realizing it is through diversity. There are many types of diversity and gender diversity is one of them. The literature suggests many studies regarding the effect of gender diversity on innovation and better performance. And the majority of them found a significant positive relationship between gender diversity and innovative performance. Diversity is the factor that helps companies to attract talent which is one of the key drivers of innovation and is an important component of the overall success of the company (Forbes Insight, n.a.). According to Atcheson (2018) to create a diverse solution or a diverse product there must be a pool of diverse views that will help to outperform rivals. In the

highly competitive global environment, gender diversity plays an important role in the success of the company by providing different views and improving performance, creativity, and innovation (Potochny, 2020). Nowadays gender diversity is not the issue of the fairness and equality it is one of the ways to achieve a better outcome and the survey conducted among the females and males of American Economic Association revealed that gender diversity is the only diversity type increases the likelihood of diverse opinions (International Monetary Fund, 2013).

For centuries communities all over the world have benefited from the inventions and creativity of female scientists, designers, and representatives of other professions (WIPO, n.a.). The study done by Ali & Metz (n.d.) identified that high levels of gender diversity have a highly positive effect on companies' competitive advantage while moderate levels of diversity have a negative effect on competitive advantage. Companies that have a diverse workforce in terms of gender outperform those who have more male dominate compositions of the workforce, companies like Louis Vuitton, Apple, and Facebook characterized with high diversity outperformed their rivals by 2.8 percent in the share price. This situation is explained by the fact that diversity makes employees happier and more engaged which contributes to better performance. Moreover, companies in which males and females are treated equally are six times more innovative meaning that tolerance culture generates new ideas (Stanley, 2016). Other research by Cheng and Groysberg (2020) done with the sample of over 60 countries identified the recruitment of women in the board of directors affects the long term innovations of the company. In low and middle countries of Africa, the Middle East, and Asia higher economic freedom of women is associated with higher levels of innovation despite the fact that in these countries the relative level of economic freedom of women is lower (Jaap, 2016).

The lack of representation of females in the workplace is a disadvantage for the company operating globally and having a large number of competitor companies. Because competition itself makes companies operate better and innovate they have to look at other issues like workforce diversity to be more successful (Christiansen, Lin, Pereira, Topalova, & Turk, 2016). Highly competitive markets demand the skills that are inherent to females such as being collaborative, empowering, and caring -the traits of the transformational style of management (Conradie, Lowies & Upton, 2015). The research done in Turkish HR consultancy companies found that transformational leadership style, in turn, contributes to organizational learning and development

that leads to innovation (Akay & Demirel, 2017). Another study by Steele, Hartog, Watts (2017) analyzed the effect of culture on the relationship between transformational leadership style and innovation and came to the conclusion that countries that are using the more transformational style of management are more innovative in the individual and team levels with no remarkable impact of culture.

Diversity also has a positive impact in the public sector - governments have to deal with the number of social, legal and political issues and these problems require different points of view through which the decisions made will be the most accurate and will benefit more stakeholders of the society (Trivedi, 2018). A survey done by EY (2016) among public sector workers from several countries found that 96% of respondents believe that diversity of opinions is one of the keys to attain the changes and development of the public sector, furthermore, 55% of respondents claimed that females are the most important underutilized asset in the public sector.

3.12. Female entrepreneurship

According to Unnikrishnan & Hanna (2019), female entrepreneurs have the necessary abilities to change the world. The pattern of female entrepreneurship reflects the character and increases the likelihood of female employment within the overall economy (Goffe & Scase, 1985). Eliminating the gender gap in entrepreneurship and employment will result in new ideas, products, and services, and to make this happen females must have access to all forms of capital, especially to the powerful networks which are a form of social capital. There are many policies and researches regarding the increase in the number of female entrepreneurs and their contribution to the domestic and global economy. Attitudes towards female entrepreneurship differ across countries and sometimes within the regions of the countries (McClelland, Swail, Bell & Ibbotson, 2005). Despite the stereotype that female-owned businesses lack savvy, their survival rate is equivalent to that of male-owned businesses. Measured by market share and revenues, entrepreneurial success is the same for males and females. Successful businesswomen usually have experience in the field in which their company operates and also possess necessary attributes such as communication and financial skills, generate new innovative ideas, effectively set up the organizational structure, and establish long term objectives (Buttner, 1993).

The study done among female entrepreneurs in Malaysia which particularly focused on innovation found a positive relationship between innovation conviction, creed, and mindset, and the need for achievement. According to the feedback from respondents, innovation is more important for female entrepreneurs rather than for male entrepreneurs since they have to be more competitive and offer more differentiated goods and services to be accepted and respected in the market (Lai, Nathan, Sin Tan, & Chan, 2010).

One type of business is an informal business which is usually favorable for females due to their financial potential and flexible nature. Ratten (2016) proposes that innovation expectation, risk averseness, and customer knowledge development affect the willingness of females to start an informal business. Female entrepreneurs have higher levels of offering new to some or to all customers than their male counterparts and global companies such as Coca Cola which made 5 million female entrepreneurs a part of their global supply chain or Wal Mart which uses the power of women-owned companies as a way to innovate compelling products. (VanderBrug, 2013).

3.13. Other perspectives on gender diversity

Knutsen (2012) argues that gender diversity is only effective when there is proper leadership otherwise diversity may not be effective and can result in conflicts in the workplace which in turn will decrease productivity. The research done by Zhang (2019) across 35 countries found that firm performance that was measured by market value and revenue, was higher only in countries the culture of which supports the gender equality and where employees understand the importance of gender diversity.

Most researches that looked for a relationship between gender and innovation were conducted within a specific country and even a specific industry the limitation of which is that cultural and industrial differences may have an effect on whether a workforce diversity will lead to better performance or innovation or not (Turban, Wu & Zhang, 2019).

Many researchers analyzed the moderation effect of gender on different topics; between empathy and aggressiveness in sport (Stanger, Kavussanu & Ring, 2015), between favoritism/nepotism and work withdrawal (Abubakar, Namin, Harazneh, Arasli & Tunc, 2017), between international experience and perceived success (Orser & Leck, 2010). But only a few researchers analyzed the moderation effect of gender on innovation. For

example, Yu, Jiarong, Chen & Shouming (2016) found that gender moderates the relationship between self-efficacy and entrepreneurs innovation during the early stage of entrepreneurial activity. On the organizational level, gender diversity in top management moderates the relationship between management capabilities and product innovation (Jiménez, Fuentes, 2016). Baer, Vadera, Leenders & Oldham (2014) found that gender diversity can be a moderator in the competition and creativity relationship, that is the creativity of groups is largely dependent on their gender composition. Results showed that groups with more female members outperformed the groups with more male members when there was intergroup competition. However, there are no studies that have evaluated the moderation effect of gender between entrepreneurship and innovation as well as between competition and innovation on the country level.

Globalization and highly competitive markets put pressure on governments and organizations and this in turn makes them look for ways to survive in this environment. As it is evident from the literature gender diversity, is the one method of achieving better outcomes and outperform rivals. The difference between males and females in many aspects can help to generate a range of views to the same situations, this may be complementary and contradictory views which are required inputs for creativeness and innovation. Therefore, I argue that in the competitive business environment gender diversity can positively affect innovation.

H2: Gender diversity moderates the relationship between ease of doing business and innovation so that the impact of ease of doing business on innovation is stronger when there is gender diversity.

3.14. Complexity of exports

Exports are defined as the products that are produced in one country and sold to another country (Segal, 2020) and they carry great importance for countries since they determine the employment rate, economic growth, and account deficit (Pettinger, 2017). It is evident that there is a positive relationship between trade and growth and particularly the relationship between exports and growth. As proof, the study done including 69 countries suggested that there is a strong linear relationship between exports and growth. The further results

showed that the composition of exports determines the strength of the growth (Greenway, Morgan & Wright,2006). There are a number of factors that influence the export potential of the country and some of them are the intensity of human capital, technology advancement, and domestic market share. The size of the companies also impacts exports that is the larger the company more its export potential but this impact is decreasing because there are more and more emerging small companies that are exporting (Wagner,1995).

Operating in the international market is riskier than operating in the domestic market because of economic, political, and social instabilities. According to the structural model of development, economies must diversity their export baskets from simple products to manufactured products to meet the objective of sustainable growth (Chenery, 1979). Since prices on commodities usually fluctuate, export-dependent economies suffer from fluctuations in export revenues. With the increase in macroeconomic uncertainties, long term economic development becomes crucial so highly sophisticated competitive product diversification and consequently diversification of exports contribute to the stability of export revenues (Ghosh & Ostry, 1994).

The export basket of the company is identical to the portfolio of an individual investor and the best method of minimizing the overall risk is diversification. The diversified export basket will reduce the dependency on each product in the basket and thus ensuring the stability in the exports (Hirsch & Lev, 1971). As time passes individuals and companies specialize in various activities, the economic efficiency increases, and the market becomes more complex in terms of differentiated products, networks making the interactions between members of the market, and these interactions foster growth and development.

Index of economic complexity which was introduced by Hildago & Hausmann (2009) with the purpose of measuring the complexity of the economy of a particular country and is based on the effective and efficient role of knowledge which explains the differences in GDP, rate of economic growth and overall development. This complexity of the economy is closely related to the level of income and welfare and can forecast future growth (Hidalgo et al., 2009). As Adam Smith (1776) stated specialization is the key to the efficiency of the economy. The division of labor into different markets and organizations fosters knowledge diffusion, thereby increasing the collective wisdom. The complexity of the economy which is the relative measure of the knowledge intensity of the economy (OEC) depends on the useful knowledge contained in it. Because every individual has a limited amount of knowledge the only way of expanding this knowledge is the facilitation of

interaction in complex networks in order to produce goods. The ability to produce a wide range of complex products depends on the knowledge of the individuals that go into the production process. Countries that are able to increase production "know-how" are home to the great diversity of complex products. The index of economic complexity measures the degree of complexity and diversity of the countries export basket. Studies indicate that countries that have not just diversity of products but also have sophisticated manufacturing products are usually more developed or are expected to rapidly grow in the future (Pugliese, Chiarotti & Zaccaria, 2014). The benefit of a complex export basket for a particular country is strengthened when other countries are not able to produce those products (Hausmann et al., 2011).

3.15. Innovation and exports

Innovation is one of the factors of success because it is one of the primary elements of appealing to the needs of customers and their satisfaction (Reguia,2014). Innovation capacity of the country depends on its innovative infrastructure particularly knowledge of the population and the innovation-friendly environment of the country

(Furman, Porter & Stern, 2002) and is closely related to terms like technological advancement and competitive advantage (Hall, 1992). Moreover, decisions that are taken in the companies also have a major impact on their survival in a competitive environment. A study done in 1990-1990 among Spanish manufacturing companies revealed that product innovation reinforces companies to enter the export market. (Cassiman & Martinez-Ros, 2007).

Innovation is considered an important element of creating and sustaining competitive advantage of countries and organizations. Common sense states that innovation results in increases in the likelihood of exports. Innovation in the context of new products, production processes, or improvements in existing products or processes are determinants of exports (Nguyen, Pham, Nguyen, & Nguyen, 2008). Innovation and exports are two complementary concepts that mean they can positively reinforce each other. Companies that take part in export activities are more likely to innovate to increase the quality of their products against global competitors. Innovation in turn can also force companies to export their products to new geographical areas and increase their sales (Golovko & Valentini, 2011). The research done in German and UK manufacturing plants

found a positive relationship between product innovation in those plants and export probability in both countries (Roper & Love, 2002). Organizational innovation can enhance exports both in a direct and indirect way. Indirectly the effect is seen through the mediating effect of technological innovation, and the extensiveness of organizational innovation will result in more exports (Azar & Ciabuschi,2011). The research done in 36 industries in the UK covering manufacture and service companies found that successful R&D programs are also positively correlated with trade performance and consequently on the volumes and prices of exports (Greenhalgh, Taylor & Wilson, 1994).

3.16. Innovation and diversity of exports

A strong positive relationship exists between innovation and export diversification which is an important part of the growth of new ventures strategy. (Deligianni, Voudouris & Lioukas, 2014). Moreover, innovation efforts and companies' strategic positioning in the domestic market can explain export diversification. (Cirera, Marin & Markwald, 2015).The study was done by Chen (2012) analyzed the impact of innovation on the durability of exports on the product level and found that the effect is stronger for the diversified products rather than for homogeneous products.

Global competition forces economics to learning by doing and learning by exporting which in turn leads to more export diversification. Horizontal exporting diversification into new sectors has a positive influence on the overall economy because it makes other sectors to learn from networking with foreign partners and from the competition. Vertical diversification- the process of moving from primary to manufactured product exports is also associated with the growth of the economy. (Herzer & Nowak-Lehnmann, 2006). The diversity of export basket not only predicts the economic growth but it also reduces the income inequality level of the country (Hartmann, Guevara, Aristaran & Hidalgo, 2017) which usually arises in the countries with low education levels and in countries with low political and economic stability along with weak market regulation laws (Odedokun, Round & Jeffery, 2001).

3.17. Factors contributing to the diversity of exports.

More and more countries understand the importance of exports and particularly the diversity of exports for development and growth. There several factors that contribute to the export basket of the country. The first one is the countries own ability and competence to diversify its basket. Since diversity depends on the creativity governments have to devote some of their resources to create a favorable environment for creativity (DiPietro & Anoruo, 2006). Secondly, the level of competition within the country and globally within similar industries or product types. The competition level in the product market influences organizations' incentives to innovate and at the same time increasing consumer welfare (Marshall & Parra, 2019). Thirdly, the ability to innovate I relation to simple technologies and exploiting already invented technologies by other nations. The export basket of a particular country can be developed either by copying the processes of other countries and introducing the small novelties or creating a completely new product by innovating (Saracco, Clemente, Gabrielli & Pietronero, 2015).

Human capital is another factor that contributes to export diversification which means that the countries that have higher education levels tend to have more diversified export baskets (Agosin, Alvarez & Bravo-Ortega, 2012). Contractor & Mudambi (2008) found a positive relationship between human capital and exports and the interesting result in this study was that human capital was not more important for the service sector than for product sectors, opposite to expectations.

3.18. Overview of studies related to the concept of economic complexity

There have been numerous studies to investigate factors that affect the diversity of exports but there are only a few ones that focused specifically on the complexity of exports. As was previously discussed there is a slight difference between diversity and complexity of exports. Diversity is a concept which primarily focuses on the quantity, but complexity focuses on the quality as well. A recent study by _ (Sepehrdoust, Davarikish, & Setarehie, 2019) concluded that trade liberalization is positively associated with economic complexity in Middle East developing countries. Another research by Hartmann, Guevara, Jara-Figueroa, Aristarán, & Hidalgo (2017) identified that economic complexity is a negative predictor of income inequality. As far as we know, no previous research has investigated the effect of innovation on the complexity of exports.

This has been discussed by a great number of authors in the literature that exports are an essential part of the development of the country and the deeper analysis of exports reveals that the competitive advantage of the

export basket is determined by its complexity. Complex export basket is characterized by the inclusion of a wide range of sophisticated products that can be produced by a few countries. To be able to maintain a complex export basket country must maintain high innovation levels. Since innovation in turn is one way of achieving this complexity by modifying existing or creating new products, services, or processes. Therefore, I hypothesize that innovation positively affects the complexity of exports.

H3: Innovation positively affects the diversity of exports

3.19. Entrepreneurship and exports

Nowadays being an exporter has great importance and entrepreneurial orientation is one way to achieve it. Entrepreneurial orientation increases the export intensity of SMEs (Fernandez & Alegre, 2015) but there is a need to analyze this relationship more precisely. In today's competitive world developed countries face competition from developing countries and this situation leads to the discovery of new opportunities, innovate, and the ability to manage resources at the global level. This new economic order combines entrepreneurship, innovation, and internationalization for success (Hagen, Denicolai & Zucchella, 2014).

A series of studies have indicated that entrepreneurship has a positive significant effect on GDP, exports, patents per population and has a negative impact on unemployment rates in a country (Cumming, Johan & Zhang, 2014). The main objectives of entrepreneurship are economic growth, job creation, poverty elimination and each of these objectives are used for attaining further objectives like export growth, and increasing the numbers of self-employed which are the indicators of

other macro indicators (Ahmad & Hoffman, 2008).

The export performance of the country is determinant of whether the fundamental structure of the economy is right. Low export levels are signals of the weaknesses that limit productivity and prevent local companies to reach global markets (Ketels, 2010). An increase in the export potential of the country depends on three things- financing, opportunity, and expertise which must be under the responsibility of the governments The first step which governments have to undertake in order to increase the exports is to increase export opportunities for SMEs (Kean, 1989). Small and medium-sized companies are recognized for their important role in creating jobs and being the parts of the global supply chain. in Europe 99% of all companies are SMEs

and 90% of them have less than 10 employees and two-thirds of all jobs in Europe are created by SMEs. In the age of globalization, considering their vital role in innovation, SMEs are primarily seen as suppliers of multinational companies allowing them to built complex value chains (Simons, 2013). The research done by Hessels & Stel (2011) analyzed the relationship between startups and economic growth while considering the startups' export orientation. Results indicated that there is a positive relationship between entrepreneurship and economic growth and export orientation of the star up makes an additional strong contribution to the growth. Export driven star ups make contributions to the generations of knowledge spillovers, increase diversity, increase competition which results in the propensity of the nation's economy. According to statistics in the US, every $1 billion increase in SME exports increases the number of new jobs by 25000 by lowering the trade deficit at the same time. To support the small business in their exporting activities in many states of US foreign trade offices were established. They provide needed expertise and provide SMEs with a foreign base for operations along with serving as a domestic source of information regarding local products and services. (Kean, 1989).

The study was done in the Spanish and Italian SMEs found that innovation and organizations earning capability mediate the relationship between entrepreneurial orientation and export performance. So for the effective export performance being entrepreneurially oriented is not sufficient and it must be followed by innovation and learning (Mesa & Alegre, 2015).

3.20. The effect of domestic competition and exports

According to Goodwin, Pierola, Denisse (2015) enforcement of competition laws is complementary to trade reforms and can be traced to export performance. Trade is determined by pro-competition market regulations which promote competition and decrease restrictions. Rivalry and elimination of barriers to entry contribute to export competitiveness and in some industries, competition policies can directly lower trade costs. The intensity of domestic competition in a country positively affects the export performance of the country measured by the global export share, especially when R&D spending creates opportunities for development and innovation. Oppositely the trade protection laws negatively affect the exports by reducing the performance. This was the results of the study by Sakakibara and Porter (2006) using the sample of Japanese industries, the

aim of the study was to find whether domestic competition has an effect to the global trade performance and results indicated that competition, rather than a monopoly, sheltered domestic market or collusion leads to improvement and competitiveness of the country in the global international market. Exports have a positive impact not only for the country but also for an exporting company since selling abroad makes the company more productive rather than focusing only on the domestic market. But at the same time exporting requires additional costs such as spending on market research in foreign country and transportation costs and adaptation of products in the foreign market (Joachim, 2016). The study done including 70 000 Chinese companies found that domestic exporters benefit more from export than foreign-owned exporters. Moreover, gains in productivity are higher for new entrants but this gain declines the more companies become experienced. Companies that are involved in exports are more likely to innovate, develop new products and services which suggests that participation in international markets increases innovation (Sun, Hong, 2011). Kim & Marion (1997) analyzed the Porter hypothesis about the positive effect of domestic competition on international market performance. The results of the study done using the performance indicators of U.S. food producer companies showed consistency with the Porter hypothesis: net export share and industry concentration are negatively related. Another study was done by Bramati, Gaggero & Solomon (2015) also found a positive relationship between competition level and export intensity using the dataset of Belgian companies from 2005-2008. Domestic market competition and international entrepreneurial orientation are factors that force SMEs to enhance their marketing and technological performance which leads to better performance in international markets (Jin & Cho, 2018).

The presence of multinational companies is another determinant of local firms' export behavior in developing countries and there are two ways through which these multinational companies can facilitate the export of the country. one of them is that local companies engage in learning processes from these companies with the help of which they can export because multinational companies have access to more information about foreign markets, better marketing skills, and distribution channels. For example, in Bangladesh, the entry of Korean garment exporter significantly increased the number of exporting companies owned by local entrepreneurs. The second channel is of facilitating the diversity of exports is competition in the local market. The increased competition forces companies to adopt more efficient production techniques that open access to

foreign markets. The liberalization of FDI in 1991 in India lead to a boom in exports at the same time (Poddar, 2004). In Central Asia and Eastern Europe, strict competition laws and cutting tariffs increased price competition and innovative activities. These policies result in the likelihood that new products will be introduced to the market (Clarke,2011). The exchange rate appreciation in 2005-2007 in China caused considerable competitive pressures due to the reduction in exports to Chinese exporter companies. As a result, exporter organizations increased their expenditures on research and development and the development of new products increased by 1.5 times. This result supported the fact that competition increases innovation and innovation increases exports (Miaojie & Zhao, 2017).

3.21. Developing countries and export diversification

Many developing countries suffer from the low demand for their domestic production and exporting is the one way of increasing the demand for production and making the cost of the production lower. The necessary requirement for exporting is the existence of an elastic demand for exports. Countries that have a narrow export basket and are highly commodity-dependent usually suffer from unstable and inelastic global demand. And the diversification of exports is one way to overcome this problem. Moreover, the export basket of the country must be competitive enough to be successful and benefit from global trade (Hesse, 2009).

In developing countries trade facilitation is crucially important for export diversification. The study done by Dennis and Shepherd (2007) with a sample of 118 developing countries found that export diversification can be achieved through low domestic market entry costs and that one percent of the reduction in the cost of international transport or cost of the exporting is also associated with export diversification. In the 2009 ease of doing business report Rwanda mad a leap from 167 to 67 place in the ranking. The reason for it was the business revolution at Costco which is one of the most demanding trade customers of the retail world and where small farmer entrepreneurs grow pungent coffee for the export. This business revolution caused a four-time increase in the GDP since 1995 (Isenberg, 2010). The diversity of exports in developing countries depends on the diversity of domestic production. It means that developing counties should produce high value-added goods, like manufacturing, for which demand is growing viably. These can be achieved through better infrastructure and access to services that depend on government regulations (Osakwe & Kilolo, 2018). Prices of services such

as custom services, customs brokers, port service providers, and trucking companies all play an important role in the operating of businesses. Some countries have a considerably high cost on such services which affect inversely the trade in those countries. In several developing countries these services are priced higher relative to developed countries and this creates difficulties for operating the businesses. The regulation of these fees by governments can help to improve the quality and reduce prices by increasing the competition (Doing Business, 2010).

At the beginning of the twenty-first century more and more developing countries became to export high tech manufacturing products, almost 25% of all exported goods in developing countries were more complex than in the past but there is still a large concentration in few countries (Mani, 2007). Primarily this was achieved by attracting foreign investment and increasing the quality and sophistication of exports. But this process can be disadvantageous in the long run since it will bring unsustainable industrialization and decrease the manufacturing value added (Lectard & Rougier, 2017).

3.22. Entrepreneurship and complexity of exports

As stated by Hausmann & Hidalgo (2011) complexity of exports depends on the productive "know-how" of the economy. From an economic perspective, knowledge becomes valuable when it is transformed into products and processes. The ability to exploit knowledge depends on its stock and absorptive capacity of individuals some of which are employees of the companies. To fully commercialize the stock of existing knowledge, transmission channels, and knowledge flows must occur and entrepreneurship is one way to exploit this knowledge (Mueller, 2006). Knowledge accumulation and its diffusion affect growth through entrepreneurial activities and incumbents. Entrepreneurs are a necessary link that converts knowledge into an economically relevant product. The study done using OECD countries from the period 1981 to 2002 supports the fact that the primary contribution to growth was through entrepreneurship and its importance increased in the 1990s. As a result, it can be stated that policies that facilitate entrepreneurial activities are necessary for knowledge diffusion and economic development (Braunerhjelm, Acs, Audretsch & Carlsson, 2009).

Previous studies have emphasized the importance of entrepreneurship and its positive effect on economic development, particularly on the export performance of the county. A closer look at the literature on

complexity of exports, however, reveals a number of gaps and shortcomings. Although theoretically knowledge spillover theory of entrepreneurship is closely linked with the economic complexity- the knowledge intensity of economy which helps to produce a wide range of sophisticated products for export, no empirical evidence was found to support this relationship. Thereby I hypothesize that facilitation of entrepreneurship through the ease of doing business positively affects economic complexity.

H4: Ease of doing business positively affects diversity of exports

4.Conceptual Model

Following conceptual model was developed for the research:

Gender

H2 +

Ease of doing business ——— H1+ ———→ Innovation

H4 +   H3+

Economic complexity
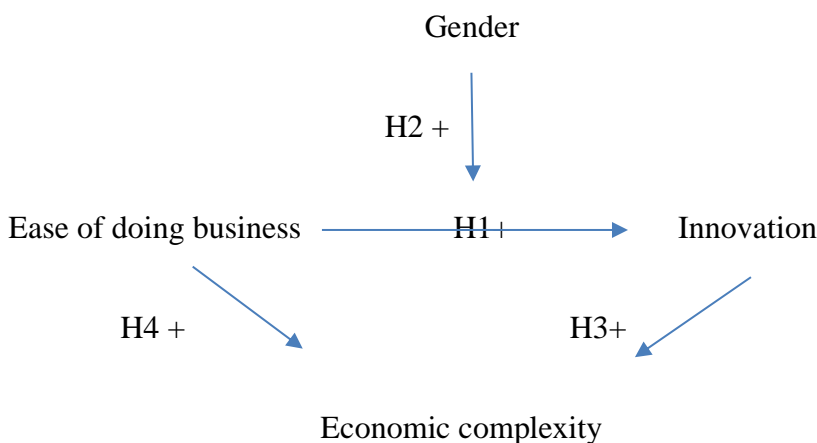
5.Methodology

5.1. Data

Due to the reason that this research was done worldwide including 63 countries of the world, and collecting the primary data on such type of the research is impossible secondary data collected by the global organizations including the World Bank was used. All data were collected within two weeks through the internet from publicly available sources. Any kind of primary data including surveys and interviews was not

used and all collected data was quantitative. Scores on each variable for each country were manually entered to the table in Microsoft Excel and were twice checked to avoid any mistakes and ensure the reliability of data. The fact that this data was collected by global organizations makes the data reliable, transparent, and with minimum bias. The overall number of variables was 10 of which 4 are main variables- innovation, gender diversity, ease of doing business and diversity of exports, and 7 are control variables- human development, economic, political, business environments, infrastructure, and culture (IDV, UAI). All data except economic complexity was of the year 2016 and economic complexity was for the 2017 year. The variables that affect the complexity of exports were used for the prior year since processes of large scale such as exports take time to be realized. Because the data on the economic complexity index is updated every five years the latest available data was for the year 2017.

5.1.1. Innovation For measuring the innovation level of the country the global innovation İndex 2016 which was published by the World Intellectual Property Organization that is a self-funding bureau of United Nations the member of which are 192 countries were used.

GII is the unique index in the world which measures innovation level of the 128 countries and that constitutes 96.3% of global GDP and 90.8% of the entire world's population including objective/quantitative-58 indicators, subjective/qualitative- 5 indicators and index data-19 indicators in its 82 total indicators. Qualitative data were derived from several private and public organizations such as UNESCO, UNIDO, World Bank, PwC, and WIPO. Usually, those indicators were related to GDP, population, or other size-related factors and needed relevant size indicators for country comparisons to be valid. İndex indicators were accessed through specialized academic institutions and agencies like the International Telecommunication Union (ITU), World Bank, and UN Public Administration. Survey data was derived from the World Economic Forum's Executive Opinion Survey (EOS).

The GII uses some data from Bureau van Dijk's R&D that was produced for the Joint Research Centre which is part of the European Commission's science and knowledge services. Bureau van Dijk includes more than 2500 public organizations making it the most all-inclusive R&D research that includes JRC methodology (Francisco Fisher, 2018).

The GII 2018 was audited by JRC and was approved as a reliable measure of national innovation meaning that GII meets the international standards of statistical soundness and transparency.

5.1.2. Gender Diversity. For measuring the gender diversity level in the countries, women workplace equality index covering years 2016-2017 was used. The data was collected by the World Bank and released in its Women, Business, and the Law report.

To ensure the transparency of the data World Bank requires each data collected to have a legal and citable source and posted on the project website. The data was collected by domestic experts of each of 189 countries using questionnaires, conversations, interviews, and area visits by the representatives of the World Bank. The reliability of the data was checked through the serious review process.

5.1.3. Ease of doing business. To measure the ease of doing the business level of the country the ease of doing business index was used. The data was collected in a standardized way. Initially, the questionnaire was designed together with expert advisers. To ensure the comparability across countries and over time the simple business case was used assuming legal forms, locations, and sizes of the businesses. Surveys were conducted among 15000 domestic experts including accountants, government officials, lawyers, business consultants, and other experts who regularly advise on legal requirements. The data collection methods included conference calls, personal visits, and written correspondence. For recruiting the respondents and verification of data 28 countries were visited. The collected data was verified several times which at the same time led to the expansion of data.

5.1.4. Complexity of exports. To measure the complexity of exports of the country economic complexity index was used. The data was derived from the observatory of economic complexity which is the master thesis of Alexander Simoes at the MIT Media Lab. The index itself was developed by Cesar A. Hidalgo and Ricardo Hausmann.

The observatory provided access to world trade data for approximately for the past 50 years, 200 countries, and 1000 different types of products. Historic data was provided by The Center for International Data from Robert Feenstra while up to date data was provided by UN COMTRADE.

5.1.5. Human development index. To control for human development which is essential for the development of the country human development index was used. The index is composed of the three important factors of human development- the level of knowledge, long and healthy life, and an appropriate standard of living. For the calculation of index secondary data was used from various global organizations:

• Life expectancy at birth: UNDESA (2015).

• Expected years of schooling: UNESCO Institute for Statistics (2016), United Nations Children's Fund (UNICEF) Multiple Indicator Cluster Surveys and ICF Macro Demographic and Health Surveys.

• Mean years of schooling: Barro and Lee (2016), UNESCO Institute for Statistics (2016), Human Development Report Office updates based on UNESCO Institute for Statistics (2016), UNICEF Multiple Indicator Cluster Surveys and ICF Macro Demographic and Health Surveys.

• GNI per capita: IMF (2016), UNSD (2016), and World Bank (2016).

5.1.6. Cultural variables. To control the cultural factors which affect the behavior and shape the values of individuals Hofstede's cultural dimensions were used. The partners of Gerald Hofstede in this research were Michael Minkov, Gert Jan Hofstede, and their teams. The data about employee value scores were derived from the databases of IBM between the years 1967 and 1973. The data was about more than 70 countries and Hofstede initially covered 40 countries which had the largest groups of respondents and after that increased the number of countries to 50. Currently, the data is available for 104 countries around the world.

Among the respondent groups were commercial airline pilots, civil service managers from 14 countries, students from 23 countries, and 'elites' from 19 countries and 'up-market' consumers from 15 countries.

5.1.7.Economic Environment. To assess the economic environment of the country index of economic freedom was used which consists of 4 components of the economic environment through which policymakers exercise control rule of law, government size, regulatory efficiency, and market openness. To calculate the Index the secondary data was used derived from. More than 100 secondary sources were used, some of them are Economist Intelligence Unit, Country Commercial Guide, Freedom in the World, U.S. Department of State and Transparency International, Country Commercial Guide, Freedom in the World, Corruption Perceptions

Index, Transparency International, Country Commercial Guide, Investment Climate Statements and news and magazine articles and governmental publications from each country. The most recent data was collected for the analysis to the possible extent.

5.1.8. Political environment. To measure the extent of the effective leadership of the country governance index of Bertelsmann Stiftung's Transformation Index was used. For the calculation of the index, both primary and secondary data were used. In the first stage, the scores are assessed on the basis of country reports that are available online. Then these results are reviewed by the second country expert. Primary data was based on qualitative surveys in which written answers were translated into numbers to ensure the comparability around the world. For ensuring the transparent data collection for 129 countries the data was reviewed by a second country expert.

5.1.9. Competitiveness index. The data about infrastructure and business sophistication which also contribute to the development are two out of twelve elements of the global competitiveness index. Global Competitiveness index uses statistical data from international organizations such as the United Nations Educational, Scientific and Cultural Organization, International Monetary Fund (IMF), and World Health Organization. Moreover, some part of the data was from the World Economic Forum's annual Executive Opinion Survey to identify concepts which require a qualitative assessment and for which the international statistical data is not available.

5.2. Measures

5.2.1. Innovation. Global Innovation Index measures the countries according to their achievements and capacity of innovation. The GII is measured by taking into account into Innovation output sub-index and innovation input sub-index. The innovation output index which will be used in the study includes two categories and the average of which is taken to measure the sub-index. Two categories and sub-categories are as following:

Innovation Output Sub Indexes:

Knowledge and technology outputs- knowledge creation, knowledge impact, and knowledge diffusion

Creative Outputs- intangible assets, creative goods and services, and online creativity.

Output sub-indexes include actual innovative outputs of the nation. These scores are calculated around 129 countries all around the world with the supervision of an advisory board that includes members from various geographical locations and backgrounds which eliminate the biases of titling results toward certain countries.

The countries for which some of the indicators were missing were not replaced with anything and were indicated as "n.a." for the sake of replicability and transparency. To treat potentially problematic outliers that could result in bias and polarization two rules were used according to the recommendation of JRC. 36 out of 58 quantitative data was affected by this. The first rule was identifying the outliers by using skewness and kurtosis if skewness is greater than 2 or kurtosis is greater than 3.5. the second rule winsorized the treatment series with 1 to 5 outliers. Those values were replaced by the next highest value where kurtosis and skewness were withing the specifies range. Further, the 82 indicators were normalized to the scale from 0 to 100, with the 100 representing highest performance and 0 representing the lowest performance. Normalization was done according to the minimum-maximum method, where max and min values were assigned by the max-min indicator sample vales, except some index and survey data, where the original data range was max and min values.

5.2.2.Gender diversity. To calculate the Women's Workplace Inequality Index, the Women and Foreign Policy program at the Council on Foreign Relations (CFR) calculated the average of each of the seven indicator scores. Further countries were ranked on the scale between 100 and 0 based on their overall average score.**y**

The World Bank developed overall fifty questions and divided them into three categories which are as follows:

1.   Gender-based differences that influence females entrepreneurship activities and employment, for example, job restriction that effect females

2.   Lack of laws and regulations protecting females, for example, the absence of laws on gender discrimination

3.   Existence of organizations and processes that are likely to protect females, for example, anti-discrimination commissions

CFR experts added new four scores- getting a job, providing incentives for work, protection of women from violence and accessing institutions, after additionally adding six new questions to the data of the World Bank, because of their important contribution to females' rights and opportunities.

The total number of questions was 56, 51 of which were yes/no questions, where for "Yes" answer "1" was assigned whereas for ''No" answer "0" was assigned. Then overall results were recalculated, using the World Bank methods of unweighted averages of the scores. Further all countries were grouped into three categories according to their scores- high for countries that scored between 76-100, medium for countries that scored between 51-75 and low for countries scored under 50.

For this analysis the "Getting Job" indicator was used which shows to what extent females are able to have the same job opportunities as males.

5.2.3.Ease of doing business. To measure the degree of entrepreneurship level in the country the Ease of doing business index was used. Ease of doing business index measures the economy's ability to meet regulatory best practices within the sample of 41 dimensions for 10 topics of Doing Business.

Topics are as follows:

Starting a business, getting a credit, registering property, dealing with construction permits, resolving insolvency, enforcing contracts, protecting minority investors, dealing with construction permits, labor market regulation and paying taxes.

The process of calculating scores for each country involves two major steps. Firstly, each individual component dimension is normalized to a common unit of measure where each of dimensions y, except the contribution rate and total tax, are rescaled by linear transformation method (worst-Y)/(worst-best).

In this formula, the highest score indicates the best regulatory performance of the dimension across all countries since 2005 or the third year when the data for the dimension was again collected. Every five years, the best and worst regulatory performances are settled on the basis of the doing business data for that particular year and these performances remain at the same level for the next five years regardless of changes in the data following years. Thus, a country may have the best regulatory performance for the dimension even if it doesn't score high in the following year. Opposite to this, a country may have a higher score than the best regulatory performance if the country develops in this dimension after the highest regulatory performance is established.

For example, the least required time to get the electricity at the best regulatory performance is established at 18 days. However, in the Korean Republic, this time is 13 days and in UAE it is just 7 days. Despite the fact that these two countries have a different number of days they both will score a maximum point of 100 on getting electricity dimension because they both exceeded the limit of 18 days. For the quality of land administration and strength of legal wights indexes the best regulatory performance score is set at the largest possible value, although there is no any country that has reached that value Fort the contribution rate and total tax, the best regulatory performance is calculated as contribution rate and total tax at the 15th percentile of the overall distribution for previous years and including doing business 2015 score. The best regulatory performance for the time to pay taxes is established as the least amount of time recorded among all countries in three major tax types- labor taxes, profit tax, and mandatory contributions and sales tax or VAT. For the time differences in trade across borders, the best regulatory performance is established as one hour although many countries have time less than one hour.

To address the problem of outliers in the distributions from most of the dimensions, the worst performance is calculated after the removal of all outliers. For example, there are many countries that need 9 days for procedures for starting a business and very few countries need 700 days). The decisions about outliers are based on the distribution of the indicators. For simplicity, a number of rules were created; for the most dispersed distributions 95th percentile was used, like cost and time dimensions, minimum capital, payment of taxes. For the number of procedures, the 99th percentile was used. For component dimensions bound by construction or definition like legal index (insolvency framework index, depth of credit information and extent of disclosure index) and the recovery rate scores outliers are not removed.

The second step of the calculation of ease of doing business score includes the averaging the individual dimensions for each country through simple averaging method into one score, initially for each topic after that for all 11 topics which are getting electricity, protecting minority investors, resolving insolvency, registering property, enforcing contracts, getting credit, dealing with construction permits, paying taxes, starting a business, labor market regulations and trading across borders. The simple average method is used because complex methods like unobserved and principal components yield the same scores as simple methods. Thus, a

simple method is used by takin the equally-weighted average of each topic and with the same method calculating the components of each topic. Overall scores are indicated on a scale from to 100 where the best regulatory performance is 100 and the worst one is represented by 0. All scores are calculated without rounding up the numbers.

5.2.4.Diversity of exports. For measuring the diversity of exports, the economic complexity index was used. The economic complexity measures the mix of products that the country is able to produce. While measuring the economic complexity three factors for the country were considered to avoid distortions.

- The population of the countries had to exceed or equal to 1.25 million

- The traded value of the country had to be larger or equal to 1 billion

- The traded value of the products had to be larger or equal to 10 million.

In order to make products and countries comparable to Balassa's definition of Revealed Comparative Advantage was used. According to this definition, a country has a competitive advantage in a product if it exports more than the fraction that is equal to the fraction of the total global trade of those products. For example, in 2008, soybeans exports were 0.35% of global trade the dollar amount of which was 42 billion dollars. In the same year, soybeans constituted 7.8% of Brazil's exports which means that Brazil has a comparative advantage in soybeans in the global market. 7.8/ 0.35=22.

While linking countries to products it is important to consider the volume of export of the particular country to the volume of the world trade products. Because the size of the country affects the volumes of export, for example for the same product the export volume of a larger country like China can be more than a smaller country like Uruguay. Moreover, it is expected that products in which export volume represents a large share of global trade such as foot-ware or cars, to represent a larger amount of share of a country's exports than products that own a small amount of the global trade like potato flour or cottonseed oil.

The economic complexity index is calculated using the diversity of products that a country produces and exports and the ubiquity which is the number of countries that are able to produce a similar product. For generating more accurate results of the number of capabilities presented in the country and required by the

product the information about diversity and ubiquity must be corrected. For this to be done average ambiguity of exported products and average diversity of the countries which produce that product must be calculated.

5.2.5.Human development index. The human development index is the way to measure the individuals and their capabilities that contribute to the development of the country, not only economic growth. It also helps to assess the national policies of the countries, identifying what are the differences between human development factors of two countries that have the same GNI per capita.

The human development index measures the average achievement of the country in the most important dimensions of human development which are the level of knowledge, long and healthy life, and an appropriate standard of living. The index is obtained by taking the geometric mean of normalized numbers for each of the above three dimensions.

The health dimensions are measured by life expectancy at birth, the education level for adults aged 25 or more is assessed by average years of schooling and for children the expected years of schooling of school entering age. The standard of living is measured by gross national income per capita. To show the diminishing effect of income with increasing GNI, the HDI used a logarithm of income. As the last step, the scores for all three dimensions are combined in one index through geometric mean.

The components of the three dimension of HDI are as follows:

Education: School attainment, School attendance:

Health: Nutrition, Children mortality

Standard of living: Electricity, Freshwater, Sanitation, Cooking oil, Having a home, Assets:

5.2.6. Cultural (Hofstede) factors. Cultural factors have a significant impact on the behavior and values of the nations a thus Hofstede's dimensions of culture were used in the analysis (Individualism versus Collectivism, Power Distance, Masculinity versus Femininity, Uncertainty Avoidance, Long-Term versus Short-Term Orientation).

Professor Geert Hofstede made a comprehensive research to identify how culture influences the values and the behavior of individuals in the workplace.

The dimensions in Hofstede's model represent the independent preferences for one situation over another that distinguish nations from each other. The scores of countries in this model are relative because culture can be meaningful only in comparison.

Individualism-collectivism index (IDV)

The individualism part of this dimension explains to what extent the individuals of society take care of only themselves or their families. Whereas collectivism shows the willingness of individuals to belong to a certain ingroup and always act in the I interest of the group rather than in their own interests. The major distinction in this dimension is between "I" and "WE" attitude of people. The higher scores represent the individualistic culture and lower scores represent collectivistic cultures.

Uncertainty avoidance index (UAI)

This dimension explains the extent to which society avoids uncertainty and ambiguity. The main point is to identify how the society looks into the future- by trying to control it or just let it happen. Countries with high UAI have strict codes of behavior and beliefs whereas weak UAI countries keep a relaxed attitude in which practice plays more role than principles. Higher scores indicate more UAI and lower scores indicate less UAI of the society.

For this analysis, only individualism and uncertainty avoidance dimensions were used since most of the studies found the significant relationship between these two dimensions and innovation.

5.2.7.Economic environment. The economic freedom index considers key aspects of the economic environment through which governments enforce policy controls- government size, market openness, rule of law and regulatory efficiency. The economic freedom index contains 10 components of economic freedom, which are calculated on the scale from 0 to 100. Each of these components includes a number of subcomponents. To measure the score of the components equally-weighted average of subcomponents is taken. And to measure the overall index of economic freedom the equally-weighted average of components is taken.

For the calculation of the index of 2016 the data from the second half of 2014 through the first half of 2015 was taken. During the analysis, the most recent data was used to the possible extent. But for some components, the historical data was used as well. For example, for the monetary freedom component, the three years weighted average rate of inflation from 2012 to 2014 was taken.

RULE OF LAW

Property Rights- measures the extent to which country laws protect private property rights and the degree to which those laws are appreciated.

Freedom from Corruption- corruption prevents economic freedom by creating an uncertain and insecure environment, it also undermines the efficiency of the economy by using the resources in the wrong way. The score of this component was derived from Transparency International's Corruption Perceptions Index (CPI), which measures corruption level in 175 countries.

GOVERNMENT SIZE

Fiscal Freedom- fiscal freedom measures the marginal and overall taxation level and consists of indirect and direct taxes that are imposed by all government levels as a part of GDP. This measure is derived from three sub-elements: marginal tax rate on corporate income, the marginal tax rate on individual income and total tax as a percentage of total GDP

Government Spending- government spending includes the expenditures of governments to different entitlement programs, consumption, and transfer payments. There is no clearly defined optimal level of government expenditures. The optimal level differs from one country to another depending on factors like geography, culture, and economic development.

REGULATORY EFFICIENCY-

Business Freedom- business freedom indicates the degree to which regulations and infrastructure of the country prevent the effective operations of the business. This component includes a number of factors that cover starting, operating, and closing the business. Scores are based on 13 sub-components calculated by equally-weighted average with the use of data from World Bank's Doing Business report:

Labor Freedom- Labor freedom takes into account qualitative factors of legal and regulatory system of the labor market of the country such as minimum wages, severance, laws prohibiting layoffs, hiring regulations and hours of work per day, additionally the participation rate of the labor force as an indicator of employment opportunities in the market.

The labor freedom component considers several aspects of the regulatory framework of a country's labor market, minimum wage, laws inhibiting layoffs, severance requirements, and measurable regulatory restraints on hiring and hours worked, plus the labor force participation rate as an indicative measure of employment opportunities in the labor market. All indicated factors are counted using an equally-weighted average method.

Monetary Freedom- monetary freedom element is the combination of price stability along with the estimate of price controls. Without microeconomic intervention price stability is an ideal condition for the economy. The overall score for this component is calculated based on the price controls and the weighted average rate of inflation for the three previous years.

OPEN MARKETS-

Trade Freedom- trade freedom measures the degree of tariff and non-tariff barriers that influence exports and imports of goods and services. It includes two components- non-tariff barriers and the trade-weighted average rates of tariff. According to the type of product different tariffs can be imposed on them. The method of weighted average tariff includes each tariff based on the share o each good. based on the share of imports for each product weighted average tariff uses weights for each tariff. Tariffs are completely qualitative measures.

Investment Freedom-in In a country with a free economy there is no restriction on the investment of capital. The movement of resources by individuals into and out of the country is free.

Such countries are represented by 100 scores in this component. However, there are many countries that have restrictions on the flow of investment in different regulations for domestic and foreign investments. Even there are restrictions on foreign exchange, transfers, payments, and capital transactions.

Financial Freedom- financial freedom indicates the banking sector's efficiency and independence from the government. When governments own financial institutions the competition an efficiency decreases as well as access to credit. In an ideal financial environment central banks' obligation is to enforce contractual obligations and prevent fraud. This index is calculated by considering seven areas of financial freedom: extent so state intervenes in banking and financial sectors, the extent to which government intervenes through indirect and direct ownership, the impact of government credit allocation, degree of capital and financial market development, and foreign competition appreciation.

5.2.8.Political environment. Because political leadership of the country plays an important role in the development of the nation the governance index of The Bertelsmann Stiftung's Transformation Index (BTI) was used as a control variable.

The Bertelsmann Stiftung's Transformation Index (BTI) measures and evaluates how countries are undertaking social changes for attaining democracy and market economy. To do this expert developed 17 criteria and assess whether 129 countries around the world met them. In the first stage, the scores are assessed on the basis of country reports that are available online. Then these results are reviewed by the second country expert. Finally, validation is assured by the by subjection all 49 scores per country to the regional and interregional calibration process. Standardization of the calculation process is one way that makes comparisons between countries' possible process.

The Bertelsmann Stiftung's Transformation Index divides the aggregate results of the transformation process and political administration into two separate indexes which are status index and governance index. The status index includes two dimensions where all 129 economies are evaluated on their efforts toward democracy under the laws and a social market economy. The governance index measures the quality of the political management of the together with which transformation process takes place.

Governance index is the part of The Bertelsmann Stiftung's Transformation Index (BTI) and measures the quality of political leadership with the help of which transformation process takes place.

Governance index includes five criteria that are based on 20 indicators which are as follows:

Level of Difficulty, Governance Performance, Resource Efficiency, Consensus-Building, International Cooperation.

It measures the extent to which policymakers steer and facilitate transformation and development processes. By evaluating the policymaker's reform policies, BTI highlights factors that determine failure and success which lead to democracy and market economy. Effective management states that countries are consistent in their objectives and the exploitation of resources effectively and wisely. Moreover, policymakers activate the set of possible consensuses for the achievement of transformation objectives and cooperate with external parties and neighborhood countries. Governance performance is assessed with the levels of difficulty, that is taken from three quantitative and three qualitative measures. Is shows that every countries quality of transformation is affected by structural barriers. By this method scarcity of resources and tough conditions are taken into account. The BTI is the single index that analyzes and compares the governance performance by self-collected data, and with the consideration of policymakers' steering capacity.

The BTI is based on the qualitative surveys in which written answers are translated into numeric ratings and are checked in 3 stage review process to make them comparable within and across the countries. This approach enables those factors of political and economic development that are appraised on the quantitative basis to be graded by the expert's qualitative assessments. One of the advantages of this method is the distinction between the existing rights and their implementation. Additionally, the magnitude of social capital and the degree to which civil society participates in the political decision-making process.

However qualitative surveys always contain some degree of subjectivity and BTI considers t while collecting and analyzing the data in order to minimize the subjective bias. To address this issue the evaluation processes involved one local and one foreign expert to assure both internal and external views are taken into account to eliminate subjective judgments. The total number of experts was 256 from leading research organizations that contributed to the formation of country reports.

While answering the questions experts referred to the standardized codebook as a foundation for the survey process. The first expert makes a draft of the report on the basis of criteria highlighted in the codebook while second expert reviews and adds comments to the country report. Additionally, while evaluating 11 of 49 indicators, experts were required to take into account some quantitative indicators such as inflation and spending on education. Two experts independently of each other make assessments on the scale from 1 to 10 and by this was countries are evaluated to what degree they satisfy their specified scores and conform to the BTI criteria.

5.2.9.Business sophistication. Business sophistication includes two linked elements: the quality of countries' overall business networks and the quality of individual companies' strategies and operations. These elements are important for developed countries when the basic sources of productivity to a large extent have been exploited. The quality of business networks and industries measured by the quality and quantity of domestic suppliers and the degree of their cooperation has importance for many reasons. When firms and suppliers from a certain industry are located in the geographically proximate groups, named clusters, the efficiency increases, and more opportunities for innovation in products and processes are achieved, along with the reduced barriers for entry for the new firms. Business sophistication is measured on the scale from 1 to 7 and includes the following dimension:

Business sophistication-number of domestic suppliers, quality of domestic suppliers, level of cluster development, state of competitive advantage, value chain, regulations of international distributions, complexity of production, marketing efforts, authority delegation, state of management capabilities

5.2.10.Infrastructure. Efficient and extensive infrastructure is crucial for the effective operation of the economy. Transportation models- railroads, high-quality roads, air, and water transport enable companies to deliver their goods and services at the right time and ensure the movement of labor to the most suitable jobs. Production processes also depend on utilities such as electricity which are supplies without any shortages so that production facilities and businesses can operate without interruption. A telecommunication network ensures the free flow of information which increases the overall efficiency of the economy by ensuring that

decisions are made by the use of all available information. Infrastructure is measured on the scale is from 1 to 7 and includes the following dimensions

1. Transport infrastructure- quality of infrastructure, including roads, railroads, ports, and air transportation

2. Electricity and telephone infrastructure- access to electricity, telephone lines and mobile subscriptions.

5.3.Analysis

For analyzing the data St

atistical Package for the Social Sciences (SPSS) program was used. For testing all hypotheses multiple linear regression was used. For analyzing the first hypothesis multiple linear regression was used including dependent and several independent variables. The dependent variable was innovation while independent variables were competition, human development, economic environments, governance of the country, business environment, cultural factors, and technological readiness of the country- variables that have an impact on the innovation level of the country. A similar method was used for the analysis of the impact of innovation on economic complexity. Economic complexity was used as a dependent variable and independent variables were human development, economy, the political leadership of the government, business environment, infrastructure, cultural determinants, and technological readiness. For the moderation test initially, the values of ease of doing business and gender diversity were standardized. After that, the interaction variable was introduced by multiplying the standardized values with each other. Finally, linear regression was run using the interaction variable. To address the problem of multicollinearity variance inflation factors (VIF) were calculated for independent variables. All obtained values of VIF were within the race of 1 to 10 indicates the absence of multicollinearity between variables (Gujarati, 2003).

6.Findings

Table 1

Model Summary

Model	R	R^2	Adj R^2	Durbin Watson
1	.749[a]	.561	.505	2.265

Table 2

ANOVA

Model	SS	df	MS	F	p
Regression	2255,451	7	322,207	10,051	,000[b]
Residual	1763,086	55	32,056		
Total	4018,537	62			

Table 3

Coefficients

Model	β	t	p
(Constant)	-14,544	-2,116	,039
Ease of doing business	,396	2,819	,007
Economic Environment	-,067	-,826	,413
IDV	,096	1,795	,078
UAI	-,033	-,893	,376
Human Development	11,280	,962	,340
Business Sophistication	2,758	1,381	,173
Governance system	,076	,100	,921

It was hypothesized that ease of doing business positively predicts innovation. To test the hypothesis, a multiple linear regression was used to evaluate the prediction of innovation from the ease of doing business, human development, UAI, IDV, business sophistication, economic and political environment. The results of regression suggested that ease of doing business, governance system, business sophistication, human development, and economic environment explained 56% of the variance, $R2 = .56$, $F(7, 55) = 10.051$, $p < .001$. The data met the assumption of independent errors (Durbin-Watson value = 2.265). Ease of doing business significantly predicted innovation, $β = .396$, $t = 2.819$, $p = .007$. One unit

of increase in the ease of doing business caused the Innovation level of the country to change by .396 units. Therefore, the null hypothesis is rejected, and the alternative hypothesis is retained.

Table 3

Mean, standard deviation and correlations

Variables	M	SD	1	2	3	4	5	6	7	8
1.Innovation	27.34 60	8,05078	-							
2.Ease of doing business	64.05 94	9,33913	,686**	-						
3.Economic Environment	60.97 5	10,8880	,234**	,430**	-					
4.IDV	31.02	15,256	,433**	,326**	,023	-				
5.UAI	64,73	22,719	,030	,179	,094	-,042	-			
6.Human Development	,7300	,11933	,626**	,785**	,319**	,359**	,366**	-		
7.Business Sophisticatio n	4,024 3	,48611	,500**	,515**	,447**	,219**	-,029	,552***	-	
8.Governance system	5,470 79	1,14777 8	,313**	,469**	,349**	,285**	,184	,333**	,004	-

*Note: N= 63,   ** p < .05, ***p < .001, one tailed.*

Table 4 shows the descriptive statistics and correlations between different study variables. Results of the Pearson correlation indicated that there was a significant positive association between ease of doing business and innovation, $r(61) = .686$, $p = .000$. According to Schober, Boer, & Schwarte (2018) the correlation coefficient of $r = .686$ is considered a moderate positive association.

The Main Determinants of Innovation and Export Complexity

Table 5

Model Summary

Model	R	R^2	Adj R^2	Durbin Watson
1	.859ᵃ	.737	.692	2.253

Table 6

ANOVA

Model	SS	df	MS	F	p
Regression	29.126	9	3.236	16.513	.000
Residual	10.387	53	.196		
Total	39.513	62			

Table 7

Coefficients

Model	β	t	p
(Constant)	-4,506	-7,597	,000
Ease of doing business	,039	3,250	,002
Innovation	,021	2,007	,050
Economic Environment	-,013	-2,042	,046
IDV	,001	,185	,854
UAI	,000	-,117	,907
Human Development	2,159	2,275	,027
Business Sophistication	,237	1,290	,203
Governance system	,052	,870	,388
Infrastructure	-,149	-1,350	,183

A multiple linear regression was used to predict complexity of exports based on the ease of doing business, innovation, infrastructure, IDV, UAI, business sophistication, human development, economic and political environment. A significant regression equation was found $F(9, 53) = 16.513$, $p < .001$, with an R^2 of .737. The data met the assumption of independent errors (Durbin-Watson value = 2.253). Countries complexity of exports is equal to -4.506 +.039 (EASE OF DOING BUSINESS) + .021 (INNOVATION) - .013 (ECONOMIC ENVIRONMENT) + 2,159 (HUMAN DEVELOPMENT). Consistent with the hypothesis both ease of doing business $\beta = .39$, t = 3,250, p = .002. and innovation $\beta = .021$, t = 2.007, p = .05 were

significant predictors of complexity of exports. Results indicate that economic environment β = .-013, t = -

2,042, p = .046 and human development β = .2.159, t = -2.275, p = .027 were significant predictors in the model

as well.

Table 8

Mean, standard deviation and correlations

Variables	M	SD	1	2	3	4	5	6	7	8	9	10
1.Complexity of exports	0,02	0,80	-									
2.Ease of doing business	64,06	9,34	,787***	-								
3.Innovation	27,35	8,05	,698***	,686***	-							
4.Economic Environment	60,98	10,89	,201	,430***	,234**	-						
5.IDV	31,02	15,26	,380**	,326**	,433***	,023	-					
6.UAI	64,73	22,72	,198	,179	,030	,094	-,042	-				
7.Human Developmen	0,73	0,12	,761***	,785***	,626***	,319**	,359**	,366**	-			
8.Business Sophistication	4,02	0,49	,480***	,515***	,500***	,447***	,219**	-,029	,552***	-		
9.Governance system	5,47	1,15	,394**	,469***	,313**	,349**	,285**	,184	,333**	,169	-	
10.Infrastructure	3,95	0,89	,514***	,649***	,552***	,376**	,252**	-,057	,635***	,735***	,210**	-

Note: N= 63, ** p < .05, ***p < .001, one tailed.

Table 8 indicates the descriptive statistics and correlations between different study variables. Results of the

Pearson correlation indicated that there was a significant positive association between the complexity of exports and

innovation, r (61) = .698, p = .000, and between the complexity of exports and ease of doing business r (61), = .787, p =

.000. A Pearson's data analysis revealed a moderate positive correlation, r = .787 and r = .698. According to (Schober,

Boer, & Schwarte, 2018).

The Main Determinants of Innovation and Export Complexity

Table 9

Model Summary

Model	R	R^2	Adj R^2	Durbin Watson
1	,784[a]	,615	,550	2.146

Table 10

ANOVA

Model	SS	df	MS	F	p
Regression	2472,317	9	274,702	9,416	,000[b]
Residual	1546,220	53	29,174		
Total	4018,537	62			

Table 11

Coefficients

Model	β	t	p
(Constant)	-22,568	-3,113	,003
moderator	1,787	2,171	,034
Ease of doing business	,348	2,343	,023
Economic Environment	-,067	-,861	,393
Gender diversity	,096	1,977	,053
IDV	,025	,435	,665
UAI	-,046	-1,292	,202
Human Developmen	12,060	1,073	,288
Business Sophistication	5,264	2,455	,017
Governance system	-,549	-,679	,500

To investigate the moderation effect of gender between ease of doing business and innovation a multiple linear regression was used. The data met the assumption of independent errors (Durbin-Watson value = 2.253). The results of the regression suggest that moderator, ease of doing business, economic environment, gender

diversity, IDV, UAI, human development, business sophistication, and governance system explained 61.5% of

the variance, $R2$ =.615,

$F (9.53)$ = 9.416, $p < .001$. The interaction between ease of doing business and gender diversity was

found to be statistically significant β = 1.787, t = 2.171, p = .034 which means that gender diversity strengthens

the relationship between ease of doing business and innovation. The analysis show that ease of doing business β

= .348, t = 2.343, p = .023 and business sophistication $ß$ = 5.264, t = 2.455, p = .017 significantly predict

innovation, however gender diversity did not significantly predict innovation $ß$ = .096, t = 1.977, p = .053.

Table 12

Mean, standard deviation and correlations

Variables	M	SD	1	2	3	4	5	6	7	8	9	10
1.Innovation	27,35	8,05	1,000									
2.moderator	0,46	0,97	-,030	1,000								
3.Ease of doing business	64,06	9,34	,686***	-,304*	1,000							
4.Economic Environment	60,98	10,89	,234**	-,177	,430***	1,000						
5.Gender diversity	63,94	22,10	,394**	-,110	,482***	,108	1,000					
6.IDV	31,02	15,26	,433***	,198	,326**	,023	,370***	-				
7.UAI	64,73	22,72	,030	,027	,179	,094	,199	-,042	-			
8.Human Development	0,73	0,12	,626***	-,184	,785***	,319**	,305**	,359*	,366*	-		
9.Business Sophistication	4,02	0,49	,500***	,285**	,515***	,447**	-,092	,219*	-,029	,552***	-	
10.Governance system	5,470 79	1,147778	,313**	-,114	,469***	,349**	,593***	,285*	,184	,333*	,169	-

*Note: N= 63, ** p < .05, ***p < .001, one tailed.*

Table shows the descriptive statistics and correlations between different study variables. Results of the

Pearson correlation indicated that there was an insignificant negative association between innovation and

moderator variable, r (61) = -.030, p = .409, and a significant positive association between innovation and ease

of doing business r (61), = .686, p = .000. Pearson's data analysis revealed a moderate positive correlation, r = .686 according to (Schober, Boer, & Schwarte, 2018).

7.Discussion

The main purpose of this study was to determine the macroeconomic factors which affect the innovation level and complexity of exports of a particular country. The findings of this study indicate that complexity of exports may be influenced by innovation and entrepreneurship. Innovation in turn is affected by entrepreneurship and gender diversity moderated this relationship. The effect of entrepreneurship on the complexity of exports was both direct and through innovation.

Innovation and complexity of exports are cornerstones of sustainable economic growth and propensity and precise understanding of them carry great importance. Results show that ease of doing business is a significant predictor of innovation meaning that entrepreneurial activities that increase the efficiency of the private sector positively affect the innovation level of the country. surprisingly ease of doing business was the only variable that significantly predicted the innovation level of the country. This result is consistent with Schumpeter's (1991) entrepreneurship theory which states that entrepreneurship serves as a key driver of innovation. He believed that development is not an automatic process, rather it must be continuously promoted by some agency within the system. And an entrepreneur is an agent that provides economic leadership that changes the existing conditions of the economy and causes continuous dynamic changes. Moreover, findings support the knowledge spillover theory of entrepreneurship according to which entrepreneurs act as a mechanism to spillover the knowledge and generate economic growth and innovation. The positive effect of entrepreneurship on innovation has been empirically proved by a great number of authors in literature Galindo & Mendez,(2014); Praag & Verslott, 2007). Another surprising finding was that none of the cultural factors (UAI, IDV) had significant elect on innovation. Although Prior research suggests that cultural factors impact

innovation. For instance, Taylor & Wilson (2012) found that individualism has a strong positive effect on innovation, even when controlling for the majority of policy variables. Sun (2009) identified that individualism and uncertainty avoidance have a significant impact on the national innovation level. One possible explanation for it is that ease of doing business is a stronger predictor of innovation than cultural factors.

The next important finding of the study was that the effect of ease of doing business on innovation becomes stronger when there an appropriate level of gender diversity in a country. Over time, a growing number of empirical studies have focused on the topics of gender diversity and its effects on innovation. The majority of the studies found the significant positive relationship between gender diversity and innovation on the organization level (Potocny, 2020, Cheng & Groysberg, 2020) however some of them suggested that diversity can lead to positive outcomes only under certain conditions such as proper leadership (Knutsen, 2012). This study focused on entrepreneurship as a primary driver of innovation since entrepreneurial activities increase the market competition which naturally leads to more innovative outcomes. But at the same time competition puts pressure on entities and to be able to sustain a competitive advantage they must make emphasize factors that may help them to further facilitate innovative activities. Gender diversity is one of those factors. The results of this research are similar to Oldham's (2014) research which found that gender diversity moderates the relationship between competition and creativity on the group level however this study was done on the country level.

Further analysis revealed that both innovation and ease of doing business levels of the country significantly impact the complexity of exports. Moreover, human development and economic environment also were significant predictors of export complexity. The strongest predictors of economic complexity were the ease of doing business. This can be explained by the fact that economic complexity is a measure of the knowledge intensity of an economy and entrepreneurship is the way of knowledge diffusion which increases collective wisdom.

Knowledge is the point at which these two concepts intersect and thus entrepreneurship has the strongest effect on economic complexity. It should be noted that ease of doing business affected economic complexity

both directly and through innovation. Since human development includes the knowledge, health, and living standards of the population it is not surprising that it was the second strongest predictor of the economic complexity. There is a considerable amount of literature which supports the relationship between entrepreneurship and diversity of exports (Goodwin, Pierola & Denisse, 2015; Kean, 1989), or between innovation (Dennis & Shepherd, 2007; Cassiman & Ros 2007) and exports. The results of his study are to some degree consistent with those but with a slight difference meaning that prior studies focused on the diversity of exports but this study analyzed the predictors of the complexity of exports which includes both diversity and ubiquity of the products.

Overall, it can be concluded that the most important economic indicators like innovation and complexity of exports which help countries to sustain a competitive advantage in international trade can be achieved through the exploitation of the human capital. This study underlines entrepreneurship and gender diversity as a way to derive the maximum advantage from human capital. Although natural resources re also valuable assets which on one hand contribute to the development, on the other hand, can hurt economies in some cases. Richard Auty (1993) proposed the theory of "natural resources curse" which described the negative effects of natural resources on the economic and social well-being of the country through the decreased attention to the private sector development which indeed affects the economic diversity of the country. Thus, human capital is the most important asset of societies and in some cases, it has more value than natural resources.

8.Theoretical contribution

A large number of existing studies in the broader literature have examined gender diversity, innovation, entrepreneurship, diversity of exports, and their interrelation. Prior empirical studies show that entrepreneurship affects the unemployment rate, distribution of income, efficient use of resources, and innovation. Additionally, there are theories about which prove the relationship between entrepreneurship and innovation; innovation theory (Schumpeter, 1991), status withdrawal theory (Hagen, 1963). The direct effect of gender diversity on innovation has also been investigated and proved by a considerable number of researches as well as the moderation effect of gender on different topics (Stanger, Kavussanu & Ring, 2015). But there are no existing

researches that analyzed the moderation effect of gender on the relationship between ease of doing business and innovation. The topic of exports and its determinants also possesses a large share in the existing literature as well as its subtopic the diversity of exports however there is a lack of studies on the topic of economic complexity. Most of the existing researches was conducted in different industries countries and sometimes including a cluster of a small number of countries. This research contributed to the three streams of the existing literature:

(1) the literature on exports in terms of economic complexity - according to findings the main determinants of the complexity of exports were ease of doing business, human development, economic environment, and innovation.

(2) the literature on entrepreneurship, in terms of new venture creation and its effect on macroeconomic variables- indicated a result of the positive effect of entrepreneurship on innovation was limited to the proof of existing studies and theories.

(3) in terms of gender diversity, the main finding o this research was that gender diversity moderates the relationship between ease of doing business and innovation.

9.Practical contribution

The complexity of exports and innovation are the macroeconomic indicators which help countries to stay competitive and achieve long-term sustainable development. The economic complexity increases the production of diversified, less inclusive goods, creates new job opportunities, increases income per capita thus leading to growth. therefore, is it is necessary for the nations to move in the direction of increasing the economic complexity. Countries whose governments pursue a scientific policy to improve the productive capacity of the are able to create favorable conditions sophisticated and high tech products. Most developing countries are dealing with problems such as low rates of economic growth, increasing income gap, unemployment, and gender discrimination. To overcome these problems, therefore, they require sustained economic growth but face some difficulties and one of the most effective solutions is to rely on the production

of knowledge-based goods and diversify the exports. Elimination of poverty and achieving income equality along with sustainable growth is the most difficult task for policymakers in developing countries. This research provides evidence on the factors which must be considered for attaining the high levels of innovation and complexity of exports.

The findings of these studies are useful especially for developing countries, and countries whose export basket is narrow consist largely of natural resources, such as Azerbaijan. Moreover, individual companies in these countries can also benefit from this research. While adopting the policies governments must make emphasize especially on the development of the private sector which will indeed resolve several important issues such as job creation, allocation of resources, efficient use of capital which in turn will increase the welfare of the society. Highly competitive domestic markets increase the innovation and consequently the complexity of exports which will ensure competitiveness for the economies. Companies will be more innovative if the market will be highly competitive rather than monopolized. So, governments must foster domestic competition in order to be a competitive country in the world. Besides the creating of a business-friendly environment in a country promotion of gender equality must also be in the center of governmental policies. By creating a gender-equal and business-friendly environment governments can benefit from efficient use of human resources.

10. Limitations and future research proposals.

As with the majority of the studies, the design of the current study is also subject to limitations. which arise due to the fact that the study was done on a global scale and one of the difficulties associated with doing research on a global scale is the difficulty of collecting the data which is the first limitation of this study. Collecting the primary data for global research is nearly impossible had collected the secondary data also has its drawbacks. Although all data was derived from reliable sources that were collected by global organizations, the data was limited. The sample size of this research was 63 which can result in the sample size bias. The sample which was used for analysis mainly included developing countries. There is a small probability of type 2 error if we claim that the hypothesis is applicable to all countries. But the sample included mainly developing countries the research can be surely applicable to developing countries. The second limitation was that the data

collected was of the years 2016 and 2017. Since the latest available data for the diversity of exports was for the 2017 year and the index is updated only every five years. If the data were available for all years 2019 data would be used so the difference is two years which is not too much outdated since the variables which were used in the research tend to take a long term to change considerably.

For future researches, it is proposed to address the limitations of this study in order to get more accurate results. Moreover, I would advise and in-depth exploration of factors that affect the complexity of exports in Azerbaijan.

11.Conclusion

This study deepened the existing knowledge about the ways to increase the innovation level and to increase the complexity of export basket of the country. There are a number of factors that affect the innovation and exports but in this study, the focus has been made on entrepreneurship explained by the ease of doing business and gender diversity.

The first results of the study confirm that ease of doing business has a positive effect on innovation, which is consistent with the Schumpeterian theory that entrepreneurship is a driver of innovation through knowledge spillover. Secondly, the study reveals that ease of doing business positively affects the diversity of exports. The explanation for this can be that the availability of the large number of companies operating in the domestic market creates a highly competitive environment in which each company gets a smaller market share, and in order to increase revenues through increasing the units of the product sold firms are motivated to enter foreign markets. Innovation is a way of achieving a competitive advantage (Porter, 1990), and entering foreign markets requires producing products and services which will be competitive enough to be recognized in international trade and this leads to the more innovative performance of the individual firms. Understanding the relationship between competition and innovation is important for governments since they play an important role in creating incentives to facilitate the competition which will stimulate the growth of the economy through innovation. The existence of a positive significant relationship between innovation and diversity of exports supports this fact. So, ease of doing business affects exports both directly and through innovation.

The results of the study support the conclusion that the gender diversity level of a country moderates the relationship between ease of doing business and innovation. Results confirm the positive moderation effect of gender. The innovation level of a country achieved by providing incentives to start a business and stimulating entrepreneurship can be higher is at the same time there is a gender diverse workforce in the country. Gender diverse workforce seems to stimulate the development of new ideas, creativity, exchange of knowledge, and using the resources more efficiently. The study presented an enhanced understanding of the factors that enable governments to transform the human capital into a greater achievement for nations and the need to analyze the market and its composition more extensively. Most studies analyzed the relationship between gender diversity and innovation in a country (García, Moreno & Martínez, 2013) or at an industry-specific level (Jiménez & Fuentes, 2016). Whereas this study made a broader view on gender diversity and analyzed the gender diversity and innovation relationship within the sample of 63 countries.

References:

Abubakar, A. M., Namin, B. H., Harazneh, I., Arasli, H., & Tunç, T. (2017). Does gender moderates the relationship between favoritism/nepotism, supervisor incivility, cynicism and workplace withdrawal: A neural network and SEM approach. *Tourism Management Perspectives*, *23*, 129–139.

Ackerman, P. L., Bowen, K. R., Beier, M. E., & Kanfer, R. (2001). Determinants of individual differences and gender differences in knowledge. *Journal of Educational Psychology, 93*(4), 797–825.

Afuah, A. (2009). *Strategic Innovation: New Game Strategies for Competitive Advantage* (1st ed.).

Aghion, P., & Griffith, R. (2008). *Competition and Growth*. Amsterdam, Netherlands: Amsterdam University Press.

Aghion, P., Bechtold, S., Cassar, L., & Herz, H. (2014). *The Causal Effects of Competition on Innovation: Experimental Evidence*.

Ahn, S. (2002). Competition, Innovation and Productivity Growth: A Review of Theory and Evidence. *SSRN Electronic Journal*, 1–77.

Akay, E., & Demirel, A. G. (2017). Transformational Leadership and Innovation: An Empirical Study of Direct and Indirect Effects in HR Consulting Companies. *International Journal of Business and Management*, *13*(1), 131.

Ali, M., Metz, I., & Kulik, C. (n.d.). *Workforce gender diversity: Is it a source of competitive advantage?*

Archer, S. L., & Waterman, A. S. (1988). Psychological Individualism: Gender Differences or Gender Neutrality? *Human Development*, *31*(2), 65–81.

Baer, M., Vadera, A. K., Leenders, R. T. A. J., & Oldham, G. R. (2014). Intergroup Competition as a Double-Edged Sword: How Sex Composition Regulates the Effects of Competition on Group Creativity. *Organization Science*, *25*(3), 892–908.

Bertelsmann Transformation Index. (2016).

Boer, H., & During, W. E. (2001). Innovation, what innovation? A comparison between product, process and organisational innovation. *International Journal of Technology Management*, *22*(1/2/3), 83.

Bonta, Bruce D. (1997). Cooperation and competition in peaceful societies. *Psychological Bulletin*, *121*(2), 299–320.

Buttner, E. H. (1993). "Female Entrepreneurs: How Far Have They Come?" Business Horizons. 36(2), 59-65

BYTYÇI, I. (2015). ENTREPRENEURSHIP AND INNOVATIVE SME'S – AS A KEY OF ECONOMIC DEVELOPMENT - KOSOVO CASE . *European Journal of Business, Economics and Accountancy* , *3*(4), 14–21.

Cassiman, B., & Golovko, E. (2010). Innovation and internationalization through exports. *Journal of International Business Studies*, *42*(1), 56–75.

Castellacci , F. (2009). *How Does Competition Affect the Relationship Between Innovation and Productivity? Estimation of a CDM Model for Norway*.

Chaudhry, A., & Garner, P. (2006). Political Competition Between Countries and Economic Growth. *Review of Development Economics*, *10*(4), 666–682.

Cornaggia, J., Mao, Y., Tian, X., & Wolfe, B. (2015). Does banking competition affect innovation? *Journal of Financial Economics*, *115*(1), 189–209.

Cromie, S. (1987). Motivations of aspiring male and female entrepreneurs. *Journal of Organizational Behavior*, *8*(3), 251–261.

Dameri, R. G. M. R., & Renata Paola Dameri, R. G. M. R. (2015). *ECIE2015-10th European Conference on Innovation and Entrepreneurship*. Amsterdam, Netherlands: ACPIL.

David Encaoua,Abraham Hollander. CompetitionPolicyandInnovation. OxfordReviewofEconomic Policy, Oxford University Press (OUP), 2002, 18 (1), pp.63-79.

Davidsson, P. (2020, April 28). Some conclusions about entrepreneurship and its support | QUT ePrints.

Dearlove, D., & Crainer, S. (2016). What we mean when we talk about innovation.

Dennis, & Sheperd. (2007). *Trade Costs, Barriers to Entry and Export Diversification in Developing Countries* .

Dereli, D. D. (2015). Innovation Management in Global Competition and Competitive Advantage. *Procedia - Social and Behavioral Sciences*, *195*, 1365–1370.

Díaz-García, C., González-Moreno, A., & Jose Sáez-Martínez, F. (2013). Gender diversity within R&D teams: Its impact on radicalness of innovation. *Innovation*, *15*(2), 149–160.

Díaz-García, C., González-Moreno, A., & Jose Sáez-Martínez, F. (2013). Gender diversity within R&D teams: Its impact on radicalness of innovation. *Innovation*, *15*(2), 149–160.

E. Pugliese, G.L. Chiarotti, A. Zaccaria, L. PietroneroThe Discernment of Heterogeneous Country Industrialization Patterns Through Economic Complexity. Universita Politecnica Delle Marche, Dipartimento di Economia Quaderno di Ricerca No. 327

Ebling, G., & Janz, N. (2003). Export and Innovation Activities in the German Service Sector: Empirical Evidence at the Firm Level. *SSRN Electronic Journal*, 1–22.

Economic Complexity Legacy Rankings (ECI). (2017).

Emerson, P. M. (2006). Corruption, competition and democracy. *Journal of Development Economics*, *81*(1), 193–212.

European Central Bank. (2017). How does innovation lead to growth?

European CEO. (2019, August 14). Gender-diverse companies outperform male-dominated rivals, Morgan Stanley finds.

Explaining Gender Differences at the Top. (2017, November 30).

EY. (2017). *Think governments are achieving gender diversity in the workforce? Think again.*

Ferguson, P. R., & Ferguson, G. J. (1994). Monopolies — Good or Bad? *Industrial Economics*, 83–107.

Field, A. (2009). *Discovering Statistics Using SPSS*. Thousand Oaks, Canada: SAGE Publications.

Food and Agriculture Organization of the United Nations . (2011). *Gender differences in assets* .

Forbes INSIGHTS. (n.d.). *Global Diversity anD inclusion Fostering Innovation Through a Diverse Workforce*.

Fried, J. (2016). Why competition can be healthy for development-friendly trade.

Friedrich Naumann Stiftung. (2017). 3 Reasons Why Ease of Doing Business in a Country is Important.

Ghani, E., Goswami, A., Kerr, S., & Kerr, W. (2017). Gender discrimination versus market competition in India.

Ghosh and Ostry, 1994

Glezakos, C. (1973). Export Instability and Economic Growth: A Statistical Verification. *Economic*

Development and Cultural Change, *21*(4, Part 1), 670–678.

Global Innovation Index 2018. (2016).

Godfrey, N. (2008, March). WHY IS COMPETITION IMPORTANT FOR GROWTH AND POVERTY

REDUCTION?

Goffee, R., & Scase, R. (2015). *Women in Charge (Routledge Revivals): The Experiences of Female*

Entrepreneurs. Abingdon, United Kingdom: Routledge.

Greenaway, D., Morgan, W., & Wright, P. (1999). Exports, export composition and growth. *The Journal of*

International Trade & Economic Development, *8*(1), 41–51.

Greenwald, M. (2014, March 13). What Exactly Is Innovation?

Gujarati, D. (2003) *Basic Econometrics*, 4th edition, Boston: McGraw Hill

H. CheneryStructural Change and Development Policy

Hales, R. (2016). The Importance Of A Diversified Economy.

Hanna, R., & Unnikrishnan, S. (2019, October 31). The Trillion-Dollar Opportunity in Supporting Female

Entrepreneurs.

Hartmann, D., Guevara, M. R., Jara-Figueroa, C., Aristarán, M., & Hidalgo, C. A. (2017). Linking Economic

Complexity, Institutions, and Income Inequality. *World Development*, *93*, 75–93.

Hausmann and Hidalgo, 2011

Henderson, T. (2018, March 6). Council Post: Why Innovation Is Crucial To Your Organization's Long-Term

Success.

Hidalgo, C. A., & Hausmann, R. (2009). The building blocks of economic complexity. *Proceedings of the*

National Academy of Sciences, *106*(26), 10570–10575.

Hirsch, S., & Lev, B. (1971). Sales Stabilization Through Export Diversification. *The Review of Economics and*

Statistics, *53*(3), 270.

Holmes, T. J., Levine, D. K., & Schmitz, J. A., Jr. (2012). Monopoly and the Incentive to Innovate When Adoption Involves Switchover Disruptions. *American Economic Journal: Microeconomics*, *4*(3), 1–33.

Hubbard, S. (2017, December 20). How Monopolies Make Gender Inequality Worse.

Hughes, K. S. (1986). Exports and innovation: A simultaneous model. *European Economic Review*, *30*(2), 383–399.

Human Development Index (HDI) | Human Development Reports. (n.d.).

International Monetary Fund. (2013). *Finance & Development*.

International Monetary Fund. (2016). *Gender Diversity in Senior Positions and Firm Performance: Evidence from Europe*.

J. Econ. Growth, 36 (16) (2011), pp. 309-342

Kaunyangi, T. (2014). The Impact of Competition on Performance of Firms in the Mobile Telecommunication Sector in Kenya. *International Journal of Scientific and Research Publications*, *4*(1), 1–22.

Kavoussi, R. M. (1984). Export expansion and economic growth. *Journal of Development Economics*, *14*(1), 241–250.

Kivikangas, J. M., Kätsyri, J., Järvelä, S., & Ravaja, N. (2014). Gender Differences in Emotional Responses to Cooperative and Competitive Game Play. *PLoS ONE*, *9*(7), e100318.

Knutsen, E. (2013, August 13). When Gender Diversity Doesn't Work (and How to Do It Right).

Kuriyama, B. C. (2020, February 18). Ease of Doing Business: Three Lessons for Round Three.

Kylliäinen, J. (2020, March 2). The Importance of Innovation – What Does it Mean for Businesses and our Society?

Lai, K., Nathan, R., Tan, K., & Chan, B. (2010). Effect of Innovation to the Success of Female Entrepreneurs. *Journal of Innovation Management in Small and Medium Enterprise*, 1–14.

Lall et al., 2006

Lectard, P., & Rougier, E. (2018). Can Developing Countries Gain from Defying Comparative Advantage? Distance to Comparative Advantage, Export Diversification and Sophistication, and the Dynamics of Specialization. *World Development*, *102*, 90–110.

Leibbrandt, A., Gneezy, U., & List, J. A. (2013). Rise and fall of competitiveness in individualistic and collectivistic societies. *Proceedings of the National Academy of Sciences*, *110*(23), 9305–9308.

Lin, X., Featherman, M., & Sarker, S. (2017). Understanding factors affecting users' social networking site continuance: A gender difference perspective. *Information & Management*, *54*(3), 383–395.

Lowies A, C. J. (2015). Management Attributes that Contribute to the Success of Women in Management Positions. *Business and Economics Journal*, *06*(02), 1–5.

Mani, S.U. (2000). Exports of High Technology Products from Developing Countries: Is it Realor a Statistical Artifact?

Manuel, E. G. (2006, August 1). Entrepreneurship and Economics by Eduardo Gando Manuel :: SSRN.

Marris, R., & Mueller, D. (1980). The Corporation, Competition, and the Invisible Hand. *Journal of Economic Literature*, *18*(1), 32–63.

Massachusetts Institute of Technology. (2020, January 22). Gender Diversity at the Board Level Can Mean Innovation Success.

McClelland, E., Swail, J., Bell, J. and Ibbotson, P. (2005), "Following the pathway of female entrepreneurs: A six-country investigation", *International Journal of Entrepreneurial Behavior & Research*, Vol. 11 No. 2, pp. 84-107.

Mehralian, Shabaninejad, G., H. (2014). The Importance of Competitiveness in New Internationalized and Competitive Environment of Pharmaceutical Industry. *Iranian Journal of Pharmaceutical Research (IJPR)*, *13*(2), 351–352.

Mehrdad Vahabi. A critical survey of the resource curse literature through the appropriability lens. 2017.

Merigó, J. M., Cancino, C. A., Coronado, F., & Urbano, D. (2016). Academic research in innovation: a country analysis. *Scientometrics*, *108*(2), 559–593.

Miller, T., & Kim, A. (2016). *Economic Freedom Index 2016*.

Moen, Ø., Tvedten, T., & Wold, A. (2018). Exploring the relationship between competition and innovation in Norwegian SMEs. *Cogent Business & Management*, *5*(1), 1–22.

Newfarmer, R., Shaw, W., & Walkenhorst, P. (2009). *Breaking Into New Markets*. Washington, USA: World Bank Publications.

Nguyen, A. N., Pham, N. Q., Nguyen, C. D., & Nguyen, N. D. (2008). Innovation and exports in Vietnam's SME sector. *The European Journal of Development Research*, *20*(2), 262–280.

Niederle, M., & Vesterlund, L. (2008). Gender Differences in Competition. *Negotiation Journal*, *24*(4), 447–463.

O. (2020, May 18). Principles of Economics – Open Textbook.

O'Reilly, C. A., III, & Tushman, M. L. (2002). *Winning Through Innovation: A Practical Guide to Leading Organizational Change and Renewal* (Revised ed.).

O'Sullivan, D., & Dooley, L. (2009). Applying Innovation.

OECD. (2015). *Gender equality and women's rights in the post-2015 agenda: A foundation for sustainable development*.

Orser, B., & Leck, J. (2010). Gender influences on career success outcomes. *Gender in Management: An International Journal*, *25*(5), 386–407.

Østergaard, C. R., Timmermans, B., & Kristinsson, K. (2011). Does a different view create something new? The effect of employee diversity on innovation. *Research Policy*, *40*(3), 500–509.

Oxford University Press, New York (1979)

Ozer, L., & Acikdilli, G. (2012). Innovatıon Adoptıon And Dıffusıon in the Industrıal Markets: An Empırıcal Research on the Small and Medıum Sıze Enterprıses in Ankara - Ostım . *International Journal of Humanities and Social Science* , *2*(23), 1–0.

Papaioannou, T. (2011). Technological innovation, global justice and politics of development. *Progress in Development Studies*, *11*(4), 321–338.

Pettinger, T. (2017, December 21). Importance of exports to the economy.

Porter, M. E. (1990). The competitive advantage of nations. Harvard Business Review, 68(2), 73–93.

Potochny, D. (2020, January 23). Gender Diversity in the Workplace.

Pugliese et al., 2014

R. Hausmann, C. HidalgoThe Network structure of the economic output

Ratten, V. (2016). Female entrepreneurship and the role of customer knowledge development, innovation

outcome expectations and culture on intentions to start informal business ventures. *International*

Journal of Entrepreneurship and Small Business, *27*(2/3), 262.

Research: When Gender Diversity Makes Firms More Productive. (2019a, February 12).

Ruiz-Jiménez, J. M., Fuentes-Fuentes, M. del M., & Ruiz-Arroyo, M. (2014). Knowledge Combination

Capability and Innovation: The Effects of Gender Diversity on Top Management Teams in Technology-

Based Firms. *Journal of Business Ethics*, *135*(3), 503–515.

S. Lall, J. Weiss, J. ZhangThe sophistication of exports: a new trade measure

Salk, R. H., Hyde, J. S., & Abramson, L. Y. (2017). Gender differences in depression in representative national

samples: Meta-analyses of diagnoses and symptoms. *Psychological Bulletin, 143*(8), 783–822.

Schober, P., Boer, C., & Schwarte, L. A. (2018). Correlation Coefficients. *Anesthesia & Analgesia*, *126*(5),

1763–1768.

Sepehrdoust, H., Davarikish, R., & Setarehie, M. (2019). The knowledge-based products and economic

complexity in developing countries. *Heliyon*, *5*(12), e02979.

Shaw, A. A. (2020, January 3). What is Business Competition? Types, Benefits & Examples.

Smith, A., & Cannan, E. (2003). *The wealth of nations*. New York, N.Y: Bantam Classic.

Sociological Methodology. Vol. 13, Pages 290-312.

SOFA Team . (2011). *Gender differences in assets*.

Stanger, N., Kavussanu, M., & Ring, C. (2016). Gender Moderates the Relationship Between Empathy and

Aggressiveness in Sport: The Mediating Role of Anger. *Journal of Applied Sport Psychology*, *29*(1),

44–58.

Steele, Logan & Watts, Logan & Den Hartog, Deanne. (2018). Transformational leadership and innovation

across cultures: A meta-analysis.

Sun, H. (2009). A meta-analysis on the influence of national culture on innovation capability. *International Journal of Entrepreneurship and Innovation Management*, *10*(3/4), 353.

Tan, J. (2001). Innovation and risk-taking in a transitional economy. *Journal of Business Venturing*, *16*(4), 359–376.

Taylor, M. Z., & Wilson, S. (2012). Does culture still matter?: The effects of individualism on national innovation rates. *Journal of Business Venturing*, *27*(2), 234–247.

TCdata360: 2nd pillar Infrastructure. (2016).

TCdata360: 9th pillar Technological readiness. (2016).

TCdata360: Business Sophistication. (2016).

Thampapillai, D. J. (2010). Perfect competition and sustainability: a brief note. *International Journal of Social Economics*, *37*(5), 384–390.

The Atlas of Economic Complexity by @HarvardGrwthLab. (n.d.).

Thurik, R., & Wennekers, S. (2004). Entrepreneurship, small business and economic growth. *Journal of Small Business and Enterprise Development*, *11*(1), 140–149.

Trager, L. (2019). Why Gender Diversity May Lead to Better Returns for Investors.

UNCTAD | Why competition and consumer protection matter. (n.d.).

van Praag, C. M., & Versloot, P. H. (2007). What is the value of entrepreneurship? A review of recent research. *Small Business Economics*, *29*(4), 351–382.

VanderBrug, J. (2014, August 20). The Global Rise of Female Entrepreneurs.

Voeten, J. (2016, Oct). Policy Brief: Gender Diversity and Innovation . *Tilburg: Tilburg University*.

Wagner, J. (1995). Exports, firm size, and firm dynamics. *Small Business Economics*, *7*(1), 29–39.

WIPO. (n.d.). Innovation, Creativity and the Gender Gap.

World Bank. (2020). Coping with a Dual Shock: Covid-19 and Oil Prices.

World Dev., 34 (2) (2006), pp. 222-237

Xu, L. C. (2000). Control, Incentives and Competition: The Impact of Reform on Chinese State-owned Enterprises. *The Economics of Transition*, *8*(1), 151–173.

The Main Determinants of Innovation and Export Complexity