NEAR EAST UNIVERSITY
INSTITUTE OF GRADUATE STUDIES
BUSINESS ADMINISTRATION PROGRAMME

THE ROLE OF PRODUCT INNOVATION IN THE PHARMACEUTICAL INDUSTRY, ITS EFFECT ON COMPETITIVENESS

GÜLSÜM BELGİN ÜNAL

PhD THESIS

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ACCEPTANCE AND APROVAL

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ÖZ

İLAÇ ENDÜSTRİSİNDE ÜRÜN İNOVASYONUNUN ROLÜ, REKABET GÜCÜ ÜZERİNE ETKİSİ

Bu araştırmanın amacı, ilaç endüstrisinde ürün inovasyonunun rolünün rekabet gücü üzerinde etkisini incelemektir. Araştırmaya Bursa ilinde faaliyet gösteren ilaç firmalarının rastgele olarak seçilen 107 çalışanı katılmaktadır. Araştırmaya katılanlara Sosyo-Demografik Veri Formu (SDVF), İnovasyon Düşüncesine Katılma Ölçeği (İDKÖ), İşletmede İnovasyon Ölçeği (İİÖ) verilmiştir.

İlaç firmalarında çalışan Lisansüstü mezunlar, işletmeleri CE belgelerine sahip ve temel pazar yapısı uluslararası olanları da inovasyon düşüncesine katılma konusunda farklı görüşler ortaya koymuşlardır. En az farklılık ise ISO belgelerine sahip ve temel pazar yapısı yerel olan işletmelerin çalışanlarıdır.

Çalışanların bulundukları işletmelerin inovasyon düşüncesinde gerçekleşen olumlu bir değişim işletmede inovasyonu, işletme yaşının artmasının işletmede inovasyonu ve yıllık ciroyu, işletme çalışan sayısının artması inovasyon düşüncesine katılan sayısını, işletmenin yaşam süresini ve yıllık ciroyu, işletmenin ihracat yapıp yapmamasının işletmenin faaliyet gösterdiği sektördeki yerini, işletme hukuki yapısı ile ilgili alınan puanların artmasının işletmenin yaşını, yıllık ciroyu ve işletme çalışan sayısını, işletme temel pazar yapısı ile ilgili alınan puanların artmasının işletmede inovasyonu, işletme yaşını, İşletmede çalışan sayısı ve işletme hukuki yapısı ile ilgili aldıkları puanları artırmaktadır. Çalışanların bulundukları işletmelerin sektör değiştirmeleri halinde yıllık cirolarında ve çalışan sayılarında, işletme ihracatında olumsuzlukların yaşanması, işletmenin yaşam süresinde, yıllık cirosunda ve işletmede çalışan sayısında, işletme hukuki yapısı ile ilgili alınan puanlar arttıkça ihracat yapma durumunda ve işletme temel pazar yapısı ile ilgili alınan puanlar arttıkça ihracat yapma durumundan aldıkları puanlar da azalma görülmektedir.

Sonuç olarak, inovasyon düşüncesine katılma ve işletmede inovasyon rekabet gücünü etkilemektedir. İşletmede inovasyon rekabet gücünü pozitif yönde etkilemiştir İşletmenin inovasyondan puan almış olması rekabet gücünü artırmaktadır.

Anahtar Kelimeler: İlaç, İlaç firması, İnovasyon, Rekabet, Bursa

ABSTRACT

THE EFFECT OF PRODUCT INNOVATION ON THE COMPETITIVENESS IN PHARMACEUTICAL INDUSTRY

The aim of this study is to investigate the effect of product innovation role on competitiveness in pharmaceutical industry. A total of 107 randomly selected employees of the pharmaceutical companies operating in the province of Bursa are involved in the study. Participants were given the socio-demographic data form (SDVF), the inclusion scale for innovation thought (İDÖÖ) and the innovation scale (İİÖ).

Graduate graduates who work in pharmaceutical companies, have CE certificates in their enterprises and the international ones with basic market structure have different opinions about participation in the idea of innovation. The least difference is the employees of enterprises with ISO certificates and basic market structure local.

A positive change in the innovation idea of the enterprises where the employees are located is the innovation in the enterprise, The company's innovation in the enterprise and the annual turnover, the increase in the number of employees in the enterprise, the number of people participating in the idea of innovation, the life expectancy of the enterprise and the annual turnover, The location of the enterprise in the sector in which the company operates, the age of the enterprise, the annual turnover and the number of employees of the enterprise, The increase in the number of points received in relation to the basic market structure of the enterprise increases the number of employees in the enterprise, the age of the enterprise, the number of employees in the enterprise and the legal structure of the enterprise. In case of changing the sector in terms of annual turnover and number of employees, the number of employees in the company's life expectancy, the annual turnover and the number of employees in the enterprise, the number of points received in relation to the legal structure of the enterprise and the number of points received in relation to the basic market structure. There is also a decrease in the points they get from making.

As a result, innovation in innovation thinking and innovation in business predicts competitiveness. Innovation in the enterprise predicts its competitive power in a positive way.

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ABBREVIATIONS

EU	: European Union
US	: United States of America
R&D	: Research and Development
ATC	: Anatomical Therapeutic Classification
ATC-3 level	:Anatomical Therapeutic Chemical Classification 3rd
ATC-4 level	:Anatomical Therapeutic Chemical Classification 4th
CAGR	: Compound Annual Growth Rate
EphMRA	: European Pharmaceutical Marketing Research Association
EUROSTAT	: The statistical Office of the European
H2RA	: H2 Reseptör Antagonist
İDKÖ	: Participation in Innovation Thinking Scale
İİÖ	: Innovation Scale in Business
OECD	: Economic Cooperation and Development Organization
PPI	: Pixels Per Inch
SDVF	: Socio-Demographic Data Form
TDK	: Turkish Language Association
TÜİK	: Turkish Statistical İnstitute

CHAPTER 1

INTRODUCTION

1.1.Definition of the Problem

The change and differentiation in the products that are in demand in the pharmaceutical industry cause intensive developments in the processes from production to meeting the consumer, causing companies to transform into structures open to differentiation in order to survive in the sectors in which they operate. Pharmaceutical companies that manage to survive in today's conditions where global competition prevails, grow and develop themselves are mostly innovative companies that attach importance to examination and progress. It is observed that the innovation culture is gaining more and more importance on a global scale because of the importance of investigation and progress, which have many reasons related to the characteristics of the market in which they operate, the organizational structure and culture of the companies and the personnel they employ (Abacıoğlu, 2010).

The increasing importance of innovation in today's economies and the fact that it is the only condition of existence / progress have directed companies and the targets of economies to innovation. Knowledge has been added to raw materials, capital and labor, which are now the classical factors of production, as well as science and technology, and the global advances in science and technology have led to the emergence of the information society. Economies that not only produce knowledge but internalize it as input have been able to have a say as the dominant power of global markets. That is why knowledge has become used as a strategic resource (Elçi, 2008).

In today's competitive environment, the way to power and success for companies, societies and economies is to transform information into innovative products and services that have a demand gap in the market and will make a difference by providing competitive advantage in the market. First of all, businesses that can objectively evaluate their own company, make a difference with their products and services, quickly turn opportunities and threats in their favor, correctly analyze the competitive environment in the sector in which they operate, and effectively evaluate these analyzes, can succeed in the market and become permanent in the market (Saleh. , 2010).

The most competitive firms are the most innovative ones. These companies enable all units of the company to learn by using the information they have acquired in the most effective way. Goods mobility, which has increased with globalization, puts companies face to face with strong competition, especially in the pharmaceutical industry. Achieving success in today's changing competitive environment is possible by developing new, different products and services by aiming to maximize customer satisfaction rather than destructive price competition, or by developing new processes that can cost existing products and services cheaper or by managing the customer's perception by using different marketing methods. Being able to adapt this development and change, which is defined as innovation, to their body is seen as the only way to keep the key to success and permanence today (Varol et al., 2011).

The research consists of four parts. In the introduction part of the research, preliminary information about the thesis variables were given from the literature review made in different formats and details, and their definitions were presented.

In the first part, the structure of the pharmaceutical industry, competition and regulation issues are discussed. In the second part, innovation is focused on. In the third part, the material and method content, the purpose and importance of the research, the question and model of the research, the rationale and analysis level of the research, the research method,

explanatory variables and hypotheses, the limitations of the research, the population, sample and selection, data collection and statistics used in the research are explained. In the fourth section, socio-demographic information, reliability analysis, t test and variance analysis, correlation and regression analysis findings of the employees participating in the survey are included. In the following section, the subject is discussed according to the findings in the literature.

As a result of the analysis made in the conclusion part of the research, participating in the idea of innovation, innovation in the enterprise, the age of the enterprise, the annual turnover of the enterprise, the number of employees in the enterprise, the sector of activity, the documents owned, the state of exporting, the legal structure of the enterprise and the basic market structure of the enterprise have been examined. Participation in innovation thinking and whether innovation in business affects competitive power are analyzed.

1.2.Purpose of the Research

In the study, determining the effect of product innovation role of pharmaceutical companies operating in pharmaceutical industry on competitiveness was determined as the main purpose of this research. At the end of the research, by examining the relationship between dependent and independent variables, it was aimed to create a source regarding the role of product innovation in the pharmaceutical industry and the impact of innovation on competitiveness.

1.3.Importance of the Research

An innovation wave occurs in the world every 80 years. The first wave was the invention of the steam engine. The second wave came with electricity and cars. Advanced nano and computer technology created the third wave. Computers, satellites, lasers, telecommunications and the internet are used today. It is predicted that all industries will be digitalized with the development of biotechnology, artificial intelligence and nano technology as the fourth wave in the next period (Karagöz 2018). Karagöz (2013) stated his prediction

about 3 years ago, but the predictions came true before 3 years were over. Due to the pandemic that started in 2020, digitalization has accelerated in almost every sector from health to education, from education to tourism.

If we need to define the digital transformation during the pandemic period, it is the holistic transformation realized by organizations in the individual, business processes and technology elements in order to provide more effective and efficient service and to achieve beneficiary satisfaction in the direction of rapidly developing information and communication technologies and rapidly changing social needs (TÜBİTAK, 2017).

It is important that the research carried out taking into account the previous studies on product innovation and competitiveness in the pharmaceutical sector will eliminate the deficiency in the issues such as originality, competence, responding to the needs of the target audience and contribution to science during and after the pandemic.

1.4. Hypotheses

Based on our research model, the following hypotheses have been developed to explain the impact of product innovation on competitiveness in pharmaceutical companies.

H1: Participating in innovation thinking has an effect on the competitiveness of the enterprise.

H2: Innovation in the business has an effect on the competitiveness of the business.

H3: There is a significant relationship between participating in innovation thinking and innovation in business.

Sub-Hypotheses of Independent Variable of Participating in Innovation Thought

The H1a hypothesis is rejected because the significance value of $p > 0.05$ for pharmaceutical company employees to participate in innovation thinking according to their gender.

The H1b hypothesis is rejected since the significance value of $p > 0.05$ for pharmaceutical company employees to participate in innovation thinking according to their age.

The H1c hypothesis was accepted as the significance value of $p < 0.05$ for pharmaceutical company employees to participate in innovation thinking according to their education level.

The H1d hypothesis is rejected since the significance value of $p > 0.05$ for pharmaceutical company employees to participate in innovation thinking according to their positions in the business.

The H1e hypothesis is rejected because the significance value of $p > 0.05$ for pharmaceutical company employees to participate in innovation thinking according to their professional experience.

Innovation Independent Variable Sub Hypotheses in Business

The H2a hypothesis is rejected because the significance value of the innovation views in the company according to the gender of the pharmaceutical company employees is $p > 0.05$.

The H2b hypothesis is rejected because the significance value of innovation views in the enterprise according to the ages of pharmaceutical company employees is $p > 0.05$.

The H2c hypothesis is rejected since the significance value of innovation views in the enterprise according to the education level of the pharmaceutical company employees is $p > 0.05$.

The H2d hypothesis is rejected because the significance value of the innovation views in the company according to the positions of the pharmaceutical company employees in the business is $p > 0.05$.

The H2e hypothesis is rejected because the significance value of the innovation views in the enterprise according to the professional experience of the pharmaceutical company employees is $p > 0.05$.

Sub-Hypotheses for Competitiveness Dependent Variable in Business

The H3a hypothesis is rejected since the significance value of the opinions of pharmaceutical company employees in the company according to their gender is $p > 0.05$.

The H3b hypothesis is rejected since the significance value of the opinions of the pharmaceutical company employees' competitiveness in the enterprise is $p > 0.05$.

H3c hypothesis was accepted since the significance value of the opinions of the competitiveness of the company according to the education level of the pharmaceutical company employees was $p < 0.05$.

The H3d hypothesis is rejected because the significance value of the opinions of the pharmaceutical company employees in the company according to their positions in the company is $p > 0.05$.

H3e hypothesis was accepted since the significance value of the opinions of the pharmaceutical company employees according to the professional experience of the company is $p < 0.05$.

1.5. Contribution of the Research to the Field

As a result of the realization of the thesis, contributions were made to scientific accumulation and benefits on participation in innovation thinking, innovation in business and competitiveness in business. It is thought that the entire pharmaceutical industry will benefit from the result that pharmaceutical industry employees participate in innovation thinking and that innovation in the business will affect the competitive power in the business. The research has been studied for the first time in the Turkish literature. It is thought that this study, which is the first review, will contribute to the literature. Due to the empirical, theoretical or methodological contribution of the research to the literature, it will be able to increase accessibility by being translated into publication.

CHAPTER 2

STRUCTURE OF THE PHARMACEUTICAL SECTOR, COMPETITION AND REGULATION

In this section, first of all, the definition of the drug and drug sector concepts will be focused on; then competition in the pharmaceutical sector, Turkey's pharmaceutical market, the world pharmaceutical market and COVID 19 will be referred to the pandemic and the pharmaceutical industry issues.

2.1.Definition of Drug and Pharmaceutical Sector

Medicines are chemical or biological based products. Chemical ones are easy to copy (through reverse engineering) and low cost to manufacture (Chelliapan et al., 2006), while biological ones are derived from human and animal metabolisms, requiring a laborious production process and involving high costs (Federal Trade Commission, 2009).

It is one of the situations such as providing new features to an output that customers are not aware of or an output that is available to an existing output, a new production stages, a new competitive environment, and a new resource for raw materials or semi-finished products (Elçi, 2008).

Pharmaceuticals are chemical or biological structures that emerge as a result of time-consuming, costly and risky R&D activities. Although their discoveries are costly and risky, once found and released (especially chemical-based drugs), they can be easily replicated by reverse engineering. As a result, when companies that bear the high costs arising from R&D activities cannot get the rewards for their investments, there is a significant decrease in new drug entries into the market. In order to eliminate this negativity, patent protection is applied intensively in the sector (Saleh, 2010).

According to the definition of the World Health Organization; "It is a substance that can be used to change or examine physiological systems or pathological, ie, disease-causing conditions, to benefit the user" (http://www.who.int/ilactanimiDSÖ-WHO-World Healty Organization).

The World Health Organization defines the drug in terms of its relations with the biological system. Besides, medicine can also be explained economically using the concept of commodity. A commodity is a use value; exchange also has a value (Marx, 1867. Act. Cauwenbergh, 2002).

In this case, it can be said that the drug has a use and exchange value like other goods. If we define the drug in terms of economics and politics, it is a social product that is used or deemed necessary to change or examine the physiological systems or pathological problems of the drug for the benefit of the user, therefore it is produced for the purpose of exchange and has the feature of 'one cannot be without it' (Abacıoğlu, 2010).

The increase in the number of people in the world, the life span they live and the increase in the treatment and medicine together with the expanding social security make the pharmaceutical sector income a constantly increasing sector (Ertin & Temel, 2016).

It is thought that the pharmaceutical sector, which is among the three leading sectors in the world competitive environment, will continue to become widespread in the future, especially in a similar pharmaceutical competition environment. It is predicted that this expansion will rise above 10% in Asia, Africa, Australia and South America, and it will emerge at a more advanced level than elsewhere (Sarsın Kaya, 2016).

Within the scope of the data in the marketing statistics (IMS) among the mainland, the sector reached a competitive width of 1.08 trillion dollars compared to the US dollar in 2015, and the pharmaceutical competition environment in the world consists of companies operating at a cross-country width of 95%. In 2015, 35% of all drug sales in the world were made by the USA, 7% by China and 6% by Japan, this amount is equal to almost 50% of all sales. 14.4% of R&D expenses in the world are made by the

pharmaceutical industry. The USA is the leading state of the market, with its individual approximate drug expense, researcher pharmaceutical industry, and sector earnings above many companies in the world. With the forecast of 1-4% expansion in the North American continent in the future, there is an expectation that the USA will continue its leadership by increasing its share. With this situation, the EU drug industry, availability in the United States behind the EU in the second stage is followed by China (IEIS, 2017; Ministry of Economy of the Republic of Turkey, 2016).

The pharmaceutical industry is considered to be one of the most critical sectors in the country in terms of economy. In addition, expressing the amount of medicines produced in very high numbers in terms of economic value reveals the desire of the sector to be managed by major players. However, the price decreases in the last six years and the fact that the profit margin did not remain in its previous state brought along structural changes in the sector. The drug, which has a line in direct proportion with the general condition of human health, are preparations that are ready for the use of the end user and directly affect the normalization process of the abnormal state in the human body. Especially drugs in a specific group cannot be used interchangeably and are not considered as substitutes. However, many products are used interchangeably and competition conditions are mentioned. In addition to using different products as trade names or molecules, a non-drug product does not correspond to a molecule that acquires a drug identity. Therefore, the high prices of drugs do not affect the necessity of the drug. This situation makes it possible to see the importance of the pharmaceutical industry in the world (Bilgener, 2002).

In this section, first of all, the demand and supply structure that differentiates the pharmaceutical industry from other sectors, and then the price and non-price regulations, which have significant effects on competition in the sector and firm behavior and strategies, and the effects of these regulations on the sector will be discussed by making use of the findings in the literature.

Pharmaceutical industry, in human and veterinary medicine, which is produced in a laboratory environment, which is taken under protection and evaluated as supplementary to its food, is compatible with pharmaceutical technology, is simple in certain dosages according to scientific standards, or the drugs are administered to the patient according to the condition of the disease. It is a branch of industry that has reached the state of special molds that can be given in solid, liquid, semi-solid and liquid forms and makes continuous production and presentation to treatment (İzmirlioğlu, 2001).

The pharmaceutical industry is a type of sector that develops on the R&D basis and is highly controlled (European Commission General Directorate of Competition, Pharmaceutical sector investigation preliminary report 2018, http://www.ieis.org.tr).

The main purpose of the sector has been determined as the existence of the pharmaceutical industry, which has market power at the international level, adds value to life characteristics and meets the majority of the state's drug needs (İzmirlioğlu, 2001).

In the following section, the economic and political structure of the sector related to supply and demand will be covered and the dynamics of the sector will be more understandable in terms of the following sections.

2.2.1. Supply and Demand Structure of the Pharmaceutical Sector

The pharmaceutical industry also has a different demand structure due to the existence of health insurances. The supply side has a strong market power and patent applications are of great importance for this sector. For all these reasons, the sector differs from other sectors. Therefore, the existence of the peculiar characteristics of the pharmaceutical industry should be mentioned: First of all, since the pharmaceutical industry is an industry that manufactures drugs based on herbal substances, whether organic or synthetic, production goes through many different stages. Second, since there is no consumer demand or the price of the product that determines the purchase and use of the drug, price elasticity is almost nonexistent. The reason why the demand elasticity of manufactured goods is low is that consumers do not directly

decide on purchasing such goods. In other words, it is not possible for the drugs to be demanded by consumers with their free will, and decisions are made by other people than consumers. For example, the doctor is the person who makes the purchasing decision on behalf of the patient (consumer). In fact, this situation shows that the competition between pharmaceutical companies is mainly formed within the same market. Because all the major pharmaceutical companies of the industry earn a large part of their income from the sale of prescription drugs, and these drugs cannot usually be purchased without a prescription from a medical doctor. Third, just as production goes through various and complex stages, an organization that will take its place in the market has to carry out a series of regulations different from each other (Karakoç, 2005).

2.2. Competition in the Pharmaceutical Sector

Competition in the pharmaceutical industry refers to a dynamic process that started in the R&D phase and climbed to a higher level with the termination of patent protection. As mentioned in the section on the product life cycle, the active ingredients researched for use in the treatment of a particular disease may face the competition of active substances that are in similar processes for the treatment of the same disease before they are marketed. In this sense, while the other conditions are equal, the active substances and the drugs containing them are commercially more advantageous than the others. Instead of talking about a single market structure such as team monopoly, monopoly, monopoly or perfect competition in the pharmaceutical sector, it would be a more accurate approach to mention what the different market structures exist in the sector and how this situation affects prices and drug consumption preferences. Competition between manufacturers in the industry can be classified as Anatomic Therapeutic Chemical Classification Level 3 (ATC-3), Anatomic Therapeutic Chemical Classification Level 4 (ATC-4), competition between the active substance and generics in the same active substance. In the anatomical therapeutic chemical system classification, the third level of the code consists of one digit number representing the therapeutic / pharmacological subgroup. For example, A13A

Tonics. The fourth level of the code consists of a one digit number representing the chemical / healing / pharmacological subgroup. For example, A11AA are Mineral multivitamins (Saleh, 2010).

2.2.1.Market Entry

Lexically, competition means the contest, competition, competition of people who follow a similar goal (TDK, 2019).

A product is a random thing that is brought into a competitive environment in terms of consuming, being considered, receiving and evaluating a demand or need (Alparslan, 2015).

According to the traditional approach, with the end of the patent protection, many generic drugs that are included in the competitive environment lead to the commercialization of the relevant market, and as a result, price competition and price decrease occur together. Contrary to the quantity competition, if the enterprises are interested in price to competition, the companies take their pricing decisions as a basis by accepting the production of another enterprise as fixed and data and if it is seen that it is impossible to make a different pricing in a homogeneous production environment, the basic model that explains the market system is the "Bertrand Model" (Jehle). and Reny, 2001).

The traditional approach expresses a parallel development with the Bertrand Model. However, empirical findings reveal that the competition process has developed differently from the above situation. There are two main factors that lead to difference. The first is that, due to the generic paradox, original drug prices continue to rise after the introduction of generics, and the second is that many generic companies enter the market at a price below the price of the original drug. In this case, the behavior of the generic drug manufacturer is more similar to the Stackelberg model than the Bertrand model, which is a duopoly market model with two-firm price competition. In Stackelberg analysis, there is a modeling in which one of the companies is a leader and another is a follower and mutual dependency is taken into account (Perloff, 2004).

In the context of the Stackelberg model, one of the duopolists thinks that there is no dependency situation (Or the number of production I produce does not affect the number of products produced by the opposite company), while another duopolyist thinks that there is dependence on the face (Kanavos et al.2008).

The market entry conditions for generic drugs and the intensity of competition at the active ingredient level arising within this framework are not the same for every country market. The main distinction that creates the differences between countries is the regulations applied. Therefore, it is difficult to talk about a general theory about competition in the sector. However, it would not be wrong to say that the introduction of generic drugs into the market significantly changed the market structure and expenditures at the active substance level, regardless of the system used.

Market Entry Under Free Market Conditions: The entry of generic drugs into the market is of great importance in terms of competition in markets where there are no or relatively low regulations that result in the way of price or profit margins. Since the prices of original drugs in such markets are free and relatively high, the only source of price reductions in the active ingredient level is generic drug entry. Regulatory authorities in the relevant countries have implemented various facilitating regulations in order to eliminate market entry barriers for generic drugs. One of these is the acceleration and simplification of the licensing process of generic drugs (OECD, 2010).

Although the introduction of generic drugs into the market is facilitated within the framework of legislation and practices, the criteria based on the companies producing these products are directly related to the structure and profit of the market to be entered. The most important market entry criteria, most of which have been obtained from studies on the North American market, are as follows (Varol et al. 2011; Torres et al. 2009):

Pre-entry market size and expected profits,

- Firm structure, product portfolio and drug characteristics,

- Market structure and competition (the number of generics and original drugs in the market has negative effects on entry),
- Length of the market entry process,
- Weight of hospital sales in total sales.

The most important of these criteria that generic drug manufacturers take as basis for entering the market is the market size before entry and the profit expectation that may arise accordingly. When the expectation is high, the number of generic drugs entering the market will be high. On the other hand, if the products in the relevant market are compatible with the product portfolio in terms of generic drug manufacturers, an increase in the willingness to enter will be expected. Reasons such as the high level of competition in the market, mature market structure and low hospital sales within sales are factors that negatively affect the entry of generic drugs into the market (Varol et al. 2011; Torres et al. 2009).

Market Entry Under Regulated Market Conditions: Firms operating in markets where price and / or profit margins are limited are not free enough in pricing. Since the prices emerging in these markets are generally in the form of maximum or fixed prices, the gains expected from the introduction of generic drugs to these markets are limited. Therefore, the importance of generics in free market conditions and the level of revenue they cause are not valid for regulated markets (Danzon, 2000).

In Sweden, where the data between 1972-1996 are examined, it has been revealed that the expected profitability has a significant effect on the generic entry in terms of regulated markets. In this study by Rudholm (2001), it was determined that there is an increase in the number of generics entering the market due to the shortening of the patent protection period. In the study conducted for the Spanish market, it was stated that the conditions valid for the markets that are not regulated are also valid for the regulated markets.

Moreno-Torres et al. (2009) conducted a study estimating the number of generic drugs entering different active ingredient markets in Spain in the period 1999-2005. In this study, which did not take into account the follow-up

products in different forms and doses offered by the companies to the market, it was concluded that the excess number of active substances in the therapeutic group with the generic products available in the market decreased the average generic entry. In the study in question, it was also found that reference pricing narrows the potential market for generics by lowering original product prices (Moreno-Torres et al. 2009).

In another study conducted on Sweden, it was revealed that the reference price system reduces the probability of generic entry on average (Ekelund and Persson, 2003).

In terms of regulated markets, not only the regulation of price and price-like instruments is sufficient to control expenditures, demand control methods are also used in practice depending on the reasons arising from the inability to control the consumption amount. Even if not direct, such as price control, demand-side controls also have effects on competition in the sector. Various regression analyzes have been made in the EU Commission Pharmaceutical Sector Report (2009) in order to measure the effects of regulations applied in the sector. Since the pharmaceutical sector is regulated at varying levels throughout the EU, it would not be wrong to say that the results here reveal important indicators in measuring the performance of the regulated sector. According to the findings of the Commission, generic drug manufacturers primarily prefer markets with high turnover active ingredients in countries where price regulations apply (EU Commission, 2009).

In the Commission Report (2009), regression analyzes were also used in terms of testing the compliance of the regulatory structure. The results reveal that various regulations play an important role in this process. The first of these is the obligation on pharmacists to provide the cheapest priced drug of the equivalent group of the drug in the doctor's prescription (mandatory generic substitution). It has been observed that generic drug entry to the market is common in countries and time zones where there is a mandatory generic substitution. Another related variable is about whether generic drugs are subject to mandatory discounts or price ceilings relative to the original

drug price. The regression results revealed a slowdown in the entry of generics into the market for such applications (especially with regard to first-year entries). According to the uncertain evaluation of this result, mandatory discounts and price ceilings eliminate this advantage of the first company entering the market (EU Commission, 2009).

The EU Commission (2009) found that generic drug manufacturers usually enter the market with 2 or 2.5 products (different formulation) per active ingredient. This figure is less than 3.5 or 4, which is the number of products per active ingredient of original drug manufacturers. Two main reasons for this difference are mentioned in the report. The first is that the generic drug manufacturer generally prefers the most commercially attractive formulations to enter the active ingredient market. The second is that when the active ingredient expires, the validity of the first formulation usually expires, but the formulations offered to the market later continue to be valid and it is not possible to enter the markets with new formulations in this sense (Moreno-Torres et al.2009).

2.2.2. Porter's Five Forces Model

Michael E. Porter, one of the academicians of Harvard School of Economics, developed a model that he defined as the "Five Forces Model" in the late 1970s. These Five Forces are a simple and effective tool for external examination and definition of a particular commercial environment (Johnson et al., 2008).

The model is a tool for evaluating external forces arising from the micro-environment that affect the profitability of companies. The main idea underlying the model was determined as the ability to define the attractiveness of the market and the income to be obtained from the general by the market (Slater & Olson, 2002).

Therefore, the success of businesses directly depends on the structure of the market. Porter's theory on the competitiveness of companies is defined as the competitive advantage of an industrial organization. According to this theory, the structure of the market is based on the assumption that the

attractiveness of the industry in which a company operates is determined by the market structure, as it affects the behavior of the participants (Raible, 2013).

The Five Forces Model is based on the acknowledgment that it derives from the competitive strategy adopted by a company to eliminate threats or take advantage of the opportunities provided by an industry (Porter, 1980).

It is important to create a strategy to gain a competitive advantage and to have enough knowledge of the industry in which the company operates. Therefore, it is possible to determine the factors affecting the company operating within the industry. According to the Five Force Models, these factors are the strength of the buyers, the strength of the suppliers, new entries to the industry, substitute products, and the current competition in the industry.

According to Porter (2008), the current competition in the industry includes different forms of market conditions such as reduction from sales price, promotion of different products that are not available in the market, campaigns related to advertisements and improvements in services. Therefore, the high level of competition between current competitors can affect the profitability of an industry.

Porter (2008) attributes this effect to the intensity on which companies compete and the foundations on which they compete. In addition, this force is affected by industry growth rate, fixed costs, the number of competitors in the same equivalence, transition costs between competitors, differentiation or exit barriers.

Porter (1980) states that new entrants to an industry bring new capacity, the desire to gain market share and often significant resources. The existence of entry barriers limits the number of companies in the sector and thus affects competition among existing competitors (Johnson et al., 2008).

Companies entering an existing industry reduce the profits of market participants by harnessing the existing demand in the industry by directly affecting their competitive advantage. The lower the barriers to entry, the

higher the threat of new entrants. According to Rothaermel (2008), the high level of entry barriers is the most important determinant of industrial profitability.

Porter (1980) lists the necessary barriers to market entry as economies of scale, product differentiation, capital requirements, cost disadvantages, access to distribution channels, and government policy. The bargaining power of the supplier defines the risk of suppliers threatening companies with the increasing price of goods or services.

According to Porter (1980), there are different factors that determine the high bargaining power of suppliers as indicators. For example, few companies dominate the industry and are more interested in the product they sell than the industry, or the industry is not the most important customer of the supplier group. The bargaining power of suppliers may be affected by the size of the supplier, the number of suppliers and alternative customers available (Slater & Olson, 2002).

Porter (2008) defines the power of customers as "the other side of strong suppliers" that is "the other side of the coin". Therefore, if this power has a high market power, it can drive down prices, force companies in the industry to have better quality or expand services, and at the same time reduce the profitability of the industry. A substitute product or service definition is the search for products or services that can fulfill the same function within an industry. Thus, substitute products and services hinder the potential profits of an industry by defining a limit for the prices of its products or services (Porter, 1980).

2.2.3. Sources of Market Power in the Pharmaceutical Industry

The pharmaceutical industry has a structure that includes important market disruptions. One of the most important obstacles to the healthy functioning of competition in the sector is the market power of the manufacturing companies. The sources of market power, on the other hand, arise mainly due to the following four factors (Ekelund & Persson, 2003):

1. Multi-Market Communication

2. Product Differentiation

3. Inefficiencies arising from demand

4. Patent protection

2.2.3.1. Multi-Market Communication

The pharmaceutical industry consists of different treatment areas and active ingredient markets, which are located under these treatment areas, but have unique market structures and competitive conditions. Although companies in the sector specialize in some treatment areas, they generally operate in more than one treatment area and in the active ingredient market, which is its sub-market, in order to benefit from economies of scale. The natural consequence of companies taking place in different markets is that they are rivals in more than one market. Within the framework of this structure, which is called multi-market communication, companies have to form their strategies in the relevant market by summarizing the competition conditions in different markets. Therefore, in some markets, competition takes place at lower levels than it should be (Coronado et al. 2008).

According to the analysis made by Bernheim and Whinston (1990), if markets differ from each other in terms of number of firms, demand conditions, or economies of scope, the constraints on the aggregated interests of firms help ensure the continuity of high prices in equilibrium. In addition, asymmetries in markets, which reduce the likelihood of cooperation between firms, can be softened in case of multi-market contact and cooperation can be facilitated.

In a coalition where multi-market communication is prevalent, the prices in the sector are higher than if there is no multi-market communication, as firms can raise prices in more competitive markets. Moreover, if markets diverge at the level of product differentiation, firms not only transfer but also redistribute their market power. The degrees of product differentiation between markets are among the most important reasons for the emergence of sustainable, coordinated prices (Saleh, 2010).

At the point of policy evaluation, it is very important for regulators and policy makers to be aware of the existence of a structure that allows communication in multiple markets in the sector. It is expected that prices in regulated markets will be lower than in free markets and accordingly more consumer benefits will arise. However, this expected effect is short-term. While price regulation in some product markets is transferred to more competitive markets, market entry is discouraged and the return on investment is lower than in unregulated markets. In total, absence of market entry or postponement of entry decisions is explained within the framework of the communication mechanism in many markets (Saleh, 2010).

In free market conditions, the redistribution of market power causes prices to increase in some markets and decrease in others. The welfare of consumers may increase if the producers consider product markets isolated from each other (Coronado et al. 2008).

As a result, the presence of communication opportunities in multiple markets is a situation that negatively affects the price competition in the pharmaceutical industry and increases the possibility of coordinated behavior. Because it is claimed that firms find it optimal to maintain their positions in high price balance in all markets and to avoid aggressive competition in order to eliminate the counter moves that may come from their competitors. The main concerns of the firms here are that the price competition that may arise between competitors is not limited to a specific market but spreads throughout the industry (Saleh, 2010).

2.2.3.2. Product Differentiation

Product differentiation is a type of product specification, and customers believe that the product types produced by various manufacturing companies in the same competitive environment are not similar and make their options separately according to various products. Product types are differentiated in order to provide higher sales price of producers and / or increase in quantity sold. Differentiation can be made in terms of physical appearance, quality, robustness, the types of services offered in its content (warranty types, after-

sales service types and information), image and the location. When it comes to product differentiation, there is an expectation that the price competition between firms in the competitive environment will soften. Therefore, when the company takes the price of the differentiated product above the price of the competitive product, the purchase request of the customer for this product type will not shift to other products entirely. Differentiation of the product refers to a situation that may cause prevention during entry, but facilitates the entry and influence of businesses that have a variety of products that customers can choose compared to existing ones (Competition Terms Dictionary, 2010).

The pharmaceutical industry is one of the sectors where the product differentiation strategy is frequently applied. One of the main reasons why the practice is so common is the strategy of avoiding price competition and compensating for falling prices in terms of markets where regulations are intense. Even products with equivalent composition in the sector may be subject to vertical differentiation due to advertising activities and company reputation. Products with close therapeutic effects but different compositions differ horizontally in terms of product properties (dose, side effects, etc.). As a result, the two products can differ from each other both vertically and horizontally. (Saleh, 2010)

Acar and Yeğenoğlu (2006) and Cleanthous (2004) discussed the demand disruptions of drugs within the framework of the "Discrete Choice Model" that allows the existence of differentiated products. In this context, product differentiation in the pharmaceutical industry, and more specifically horizontal product differentiation, includes the characteristics of the demands (eg a specific medical condition and history) that arise within the framework of the needs and preferences of consumers (patient / doctor). Since product differentiation is one of the sources of market power, it is considered as one of the issues that should be addressed in competition analysis.

Product differentiation in the pharmaceutical industry can occur not only between original drugs and generic drugs, but also within the generic drug

group. Product differentiation within the generic drug group can be on a brand basis in order to create consumer loyalty (in some cases it is in the form of branded-unbranded generic distinction), it can also be in the form of dose and package size, and whether the whole dose and package amount in the market is presented or not (Wiggins & Mannes, 2004).

Product differentiation in the sector is a defense mechanism developed by companies against the negativities caused by price competition and price regulations. Drugs in different forms, doses and packages developed by original drug manufacturers in order to avoid increasing competition are considered as new drugs and thus become an important element of the increase in expenditures for countries where higher prices can be obtained. On the other hand, product differentiation, which is called vertical differentiation and which aims to create / protect brand dependency by bringing elements such as advertising and quality to the forefront without any differentiation in the product, also aims to prevent the decrease in the prices and sales of original products. Whether horizontal or vertical, product differentiation is a strategy used to reduce the effect of price competition, and consequently, it serves to make the competition in the sector faulty (Ersoy & Şengül, 2008).

2.2.3.3. Uncertainties Arising from the Demand

Information asymmetry, third party expenditures and inefficiencies arising from the proxy problem are among the most important reasons for the uncertainty arising from the demand side in the pharmaceutical industry. The combination of all these factors prevents the effective functioning of the demand law in the sector and consequently, demand elasticity is realized at low levels (Çolak, 2013).

The information asymmetry in the sector, the problem of attorneys and not being sensitive to price are basically a result of the triple demand structure that emerges as doctor, patient and health insurance. The choices made by the segments of the said structure for different reasons are among the most important reasons for the uncertainties arising from the demand in the sector.

In this context, doctors, who can make decisions independently of the cost of the drug and the patient's preferences, generally prefer the original drugs they have used for a long time to generic drugs that have recently entered the market and have lower prices and End-users whose drug expenditures are covered by health insurances and who do not have sufficient information about drugs in the market do not always prefer affordable drugs are two of the clearest indicators of this situation (Doğan, 2016).

Although health insurances, which have the most information about prices in the sector and meet a significant part of drug financing, have the opportunity to direct patients and doctors with various instruments, as a result, their impact on the market is directly related to the choice of the drug to be consumed, so intervention opportunities in this issue are limited. . Another indicator that the demand structure in the sector is not efficient enough is the generic paradox, which mostly occurs in free market conditions. This situation, which is observed in the economic analyzes made especially for the US market, where free pricing is in question, is a result of the strategy used by original drug manufacturers to take advantage of the inefficiencies in demand, especially brand dependency in the sector. Depending on this strategy, original drug manufacturers can determine their prices regardless of the competitive conditions in the sector, by taking into account some loss of market share, thanks to the existence of a segment that does not have price sensitivity such as doctors and final consumers (Bhat, 2005).

2.2.3.4. Patent Protection

Patent protection is an important tool applied in order to ensure the balance between profit and use in terms of incurred R&D costs. If the patent period is longer than necessary, the balance will deteriorate in favor of earnings, and optimal use will not be achieved due to the loss of wealth on account of the price set above the marginal cost. In the case of a shorter patent period than necessary, discovery efforts and future R&D processes will be adversely affected, since there will be an advantage in terms of usage (Karakoç, 2005).

Patents protecting the active ingredient are tools that provide monopoly power to the owner companies in terms of that active ingredient. Although there is no real monopoly in the therapeutic markets due to the competition of active ingredients with similar effects and other medical methods, they are indicative of an important market power. As is known, in the theory of economics, the price level above the marginal cost causes the transfer of a certain amount of consumer surplus to the producers. In addition, the said margin causes weight loss, which can be called inefficiency that does not go to any segment. Therefore, patent application is an application that causes loss of efficiency on its own. However, these losses are partially ignored due to their contribution to the R&D process and encouraging dynamic competition in the sector.

The losses caused by patent application in a sectoral sense are not limited to those mentioned above. Both the fact that the actual patent period is shorter than 20 years and the cost / profit ratio of newly acquired patents gradually decreased, caused patents to be used as a means of preventing competition. In the EU Commission Sector Research Report (2009), it has been determined that patents are used to delay the introduction of generic drugs or to strengthen the activities of generic drug manufacturers in the market. Patents such as method, secondary indication, form, dose, etc., which are especially called secondary patents and defining patents other than the active ingredient, are more suitable for use within the scope of the mentioned purposes, as they are relatively weak in terms of protection they provide.

2.3. Turkey Pharmaceutical Market

Turkey's value of the pharmaceutical market in 2017, with 24.5 billion TL in producer prices, was 2.2 billion cans in box scale (Figure 1.1).

Source: IQVIA, İEİS
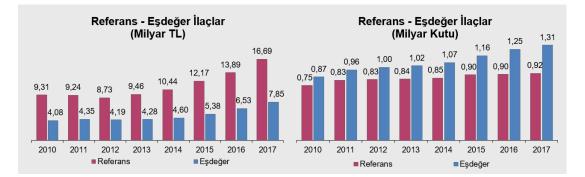
Figure 1.1. Turkey Pharmaceutical Market

When the 8 years between 2010 and 2017 were investigated, it was seen that the pharmaceutical competition environment increased by 83.2% from 13.39 billion TL in 2010 to 24.54 billion TL in 2017. Reaching this size explains a 9% increase in the Compound Annual Growth Rate (CAGR) on a compound basis, while it explains the real increase of only 3.4% when the producer price inflation of 77.3% in the similar period is observed. When analyzed in terms of volume, drug reactivity conditions increased by 37.4% from 1.62 billion boxes in 2010 to 2.22 billion boxes in 2017. This increase is at the level of 4.6% per year (CAGR) on a compound basis. In the case of this expansion, factors such as the increase in the health services offered by the state and the increase in access to the doctor, the increase in the average life expectancy, and the number of people who are increasing and older are affected.
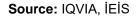
When the enterprises operating in the sector were investigated, the total number of businesses, which was 441 in 2010, reached 492 in 2017. When the domestic-multinational capital difference is examined, while 109 multinational companies were working in the sector in 2010, this number was 120 in 2017. Along with this situation, 40 domestic enterprises were included
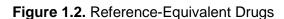
in the competitive environment during this period and the number of domestic enterprises reached 327 in 2017. The market share of multinational enterprises on the value scale has decreased by 1 point in the last 8 years to 66%. On the other hand, 50 enterprises constituted 90% of the competitive environment in 2010. In the 8-year period, the positions of the leading companies in the competitive environment have changed negatively and the number of businesses that make up 90% of the competitive environment has increased to 65 in 2017. The share of companies with international capital in these enterprises is 69%.
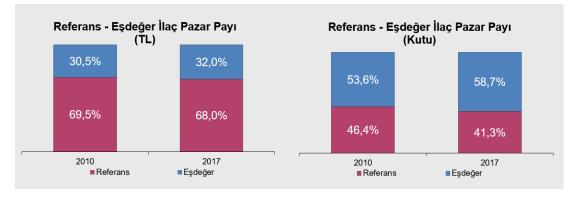
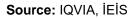### 2.3.1. Reference-Equivalent Drugs

The competitive environment of reference drugs was realized as 16.69 billion TL in 2017 as can be seen in figure 1.2. On the box scale, 0.92 billion boxes were sold. As can be seen in Figure 1.2, the generic medicine market has a value of 7.85 billion TL in 2017, and a volume of 1.31 billion on a box scale.

Source: IQVIA, İEİS

Figure 1.2. Reference-Equivalent Drugs

Source: IQVIA, İEİS

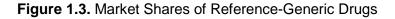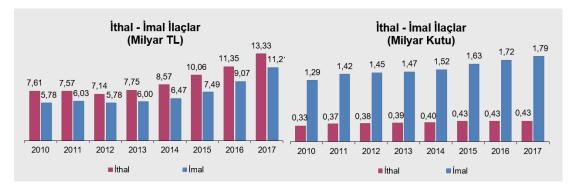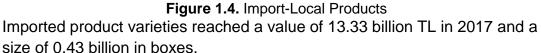**Figure 1.3.** Market Shares of Reference-Generic Drugs

Total growth on the value scale in the last 8 years on the basis of reference drugs has been 79.1%. While this growth shows an increase of 8.7% on a compound basis (CAGR), it explains a growth of 1.1% when cleansed from inflation. On a box basis, reference drugs increased by 22.4% within the linked periods. Generic drugs have increased their market share against reference drugs by providing value, by growing above the competitive environment since 2015. In the period between 2010 and 2017, the total of equivalent drugs increased by 92.5%. When the annual growth rate (CAGR) is investigated on a compound basis, this growth reveals an increase of 9.8%.
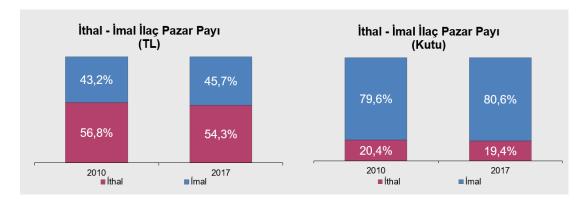
2.3.2. Import-Local Products

Imported product types are shown in Figure 1.4 below.

Source: IQVIA, İEİS

Figure 1.4. Import-Local Products

Imported product varieties reached a value of 13.33 billion TL in 2017 and a size of 0.43 billion in boxes.
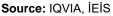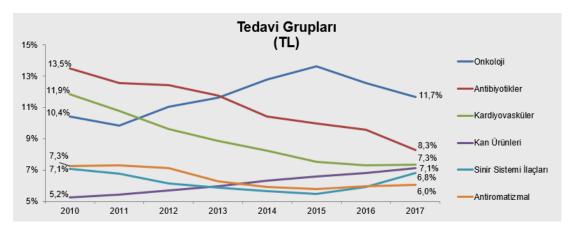

Source: IQVIA, İEİS

Figure 1.5. Market Shares of Imported-Local Products

Imported product types and the types of drugs produced throughout the country were realized as 11.21 billion TL and 1.79 billion boxes in 2017 as shown in Figure 1.5.
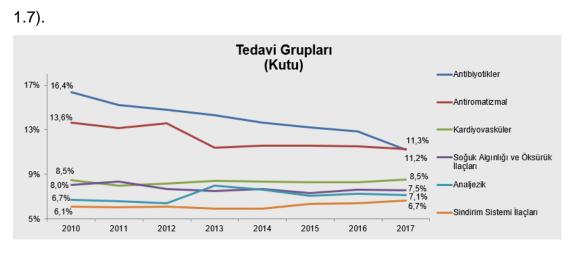
2.3.3. Treatment Groups

When the competitive environment of drugs is investigated in terms of treatment groups, oncology and blood products have increased in the last 8 years on an amount basis. As seen in Figure 1.6, although oncology drug types have lost their share compared to the previous year, they became the most sold treatment group in the competitive environment in 2017 with a share of 11.7%.

Source: IQVIA, İEİS

Figure 1.6. Treatment Groups (TL)

When we investigate the number of boxes, antibiotics and antirheumatic drugs are the leading treatment groups in the competitive environment with 11.3%. These drugs are followed by cardiovascular drugs with 8.5% (Figure

1.7).

Source: IQVIA, İEİS
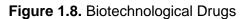
Figure 1.7. Treatment Groups (Box)

2.3.4. Biotechnological Drugs

Biotechnological drug type, which constitutes 19.5% of the drugs that should be prescribed, reached a volume of 4.1 billion TL in 2017. While reference drugs were 3.3 billion TL in 2016, it increased by 19.8% to 3.95 billion TL in 2017. Biosimilar drugs, on the other hand, increased by 53.8% in 2017 and reached 190 million TL. Biotechnological drugs were sold 27.7 million boxes in 2017 (Figure 1.8).

Source: IQVIA, İEİS
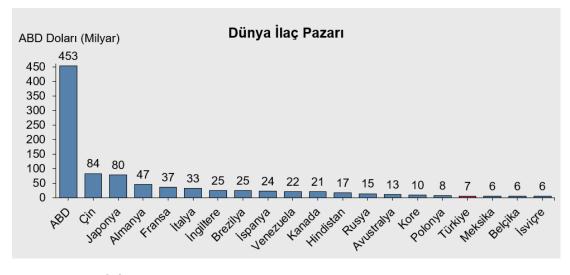
Figure 1.8. Biotechnological Drugs

The rate of use of biotechnological drugs in the world has exceeded 20% and this amount continues to increase. Turkey has also move ahead with these increase the ratio. biotechnological drugs in Turkey in 2017, with 4.1 billion TL in the prescription drug market has a share of about 19.5%. 208 brands available in the Turkey market within 93 form 46 form reference brand is

available in 17 biotechnological and biosimilar medicines. The biotech pharmaceutical market consists of 254 forms of drugs in 110 brands in total. Biosimilar 6 17 units consisting of all forms of brand drugs takes place in Turkey. Between the years 2018-2024 2 reference biotechnology, 39 biosimilar, 1 biologically superior drug is manufactured in Turkey. The production of these drugs which had to be imported from foreign countries in Turkey will not only make the patients reach these drugs easier but also will provide benefits to the economy of Turkey. When reference biotechnological products were researched, the competition conditions, which were at the level of 3.3 billion TL in 2016, increased by 20% in 2017 and reached 3.9 billion TL. Biosimilar pharmaceutical competition environment increased by 54% in 2017 and reached 190 million TL. On a box basis, biotechnological drugs increased by 8% in 2017 and reached 28 million boxes. Box sales of reference biotechnological products increased by 4% compared to the previous year, and biosimilar drugs increased by 31%. 4.5 million boxes of biosimilar drugs were sold in 2017. In pharmaceutical market in Turkey, biosimilar species comprising epidermal growth factor such as abciximab, epoetin alfa, filgrastim, insulin glargine, somatropin, infliximab, enoxaparin sodium, recombinant are licensed. In this enumerated type biosimilars which are produced in Turkey contain enoxaparin sodium, epoetin alfa, filgrastim, infliximab, and insulin glargine as active ingredients.

2.4. World Pharmaceutical Market

World pharmaceutical competition reached $ 1.10 trillion in 2017. Turkey ranks 17th in the world in 2017. (Figure 1.10).

Source: **IQVIA, İEİS**

Figure 1.9. World Pharmaceutical Market (2017)

The world pharmaceutical market size reached a volume of 1.1 trillion dollars at the end of 2017. The leader of the industry is the USA, followed by China, Japan, Germany and France. It is predicted that most oncology drugs will be used in the future. While oncology drugs constituted 11.7% of the World Pharmaceutical Market in 2016, this rate is expected to increase to 17.5% in 2022. In terms of sales volume, it is projected to reach a level of almost twice between 2016 and 2022.

In this case, oncology drugs will cause a serious demand in our country. Before the Pharmaceutical Track and Trace System was developed in our country, patients in need of oncology drugs were having difficulties and could not obtain drugs, but with ITS, it can now be easily seen in which province and pharmacies whether such drugs are in stock or not. In the upcoming times when oncology drugs will increase in market share and sales volume, the Pharmaceutical Track and Trace System will play an important role in accessing and tracking these drugs. In 2017, 10 pharmaceutical companies, one of the largest pharmaceutical companies in the world, made sales of US $ 437,257 billion, with a share of approximately 40% of the global competitive environment. More than 15 global pharmaceutical companies caused sales of 568.617 billion dollars, which constitutes 51% of the global competitive environment.

2.4.1. World Generic Pharmaceuticals Market

The generic market conditions in which the world's pharmaceutical companies are located make up almost a quarter of the pharmaceutical industry. The data show that the generic drug competition environment is growing faster than the licensed drug competition environment. Due to the relatively low cost of generic drugs, alternative reasons are found during production, especially in advancing states, indicating that the market will maintain its importance for years to come. It shows that in the next five years, the generic drug market will grow faster than the original drug market, reaching a size of 10–15% in the world. From another point of view, the data in the USA, which is the largest generic drug market in the world, conveys information about the size and importance of the sector. All of the top 6 pharmaceutical companies in the USA are producing generics. Within the USA, generic medicine has a 35% market share. Since 2000, the US generic drug industry has grown by almost 40%. The most important characteristic of the generic medicine industry is that it shows a periodic performance. The performance of the sector is especially related to the expiration of the protection periods of certain drugs in the world and the patent of the drug (Acaray, 2007).

The period of 2006-2018 has become a period in which the production of new important generic drugs has started and the performance of the sector has gained significant momentum accordingly. In this period, it is claimed that generic pharmaceutical companies in the USA, EU and India will strengthen and their market shares will increase. However, these advances, which benefit the generic drug sector, do not appear to be sustainable. Strict enforcement practices such as drug patents and data retention activities required by the World Trade Organization (WTO) will negatively affect the generic pharmaceutical industry. What matters is the nature of the generic drug industry. The generic medicine sector is associated with the original pharmaceutical sector. The number of original drugs whose data protection periods have expired directly shows the performance of the generic pharmaceutical industry. For this reason, the decrease in the number of drug

patents and the decreasing number of innovative products indicate that serious problems await the generic drug sector in the long term. With these effects, there is a strong consolidation expectation within the generic drug market, as in the original drug market, and the idea that becoming a monopoly will increase with the mergers and acquisitions of the company. Therefore, these trends in the generic drug sector also show that it is not possible for the prices of drugs to decrease under market conditions, and therefore, the public has to make an attempt both within the pharmaceutical sector and in the health structure in order for citizens to access low-priced drugs (Bilgener, 2002).

2.5. Covid 19 Pandemic and Pharmaceutical Sector

The whole world is shaken to cause Corona shown in a detailed manner the research associated with the virus KPMG in Turkey, 'Business Overview 2020 - and the effects of the economic life of the pharmaceutical industry in drug pandemics Report Covidien-19 was investigated. It has been stated that the pandemic is the main agenda of 2020-2021. COVID-19, which is 80-90% similar to the SARS virus technically seen in 2020, is the new version of the extremely severe acute respiratory syndrome. It is more contagious than MERS in 2012 and SARS viruses seen in 2020. It can pass to humans by respiration. However, similar symptoms are seen in the disease stage. Symptom severity varies from individual to individual. The main reason for the increase in contagion is that those who survive the disease do not go to the hospital. COVID-19 negatively affects the performance of all sectors beyond the anxiety in human deaths and social life.

According to Dun & BradStreet's review, at least 5 million companies, including 938 large companies in Fortune 1000, were negatively affected by the economic chaos caused by the virus. It had a negative impact on global growth and targets were pulled down. China alone lost 550 billion dollars in revenue within 2 months. The pharmaceutical industry's burden has increased in controlling the COVID-19 pandemic. Developed pharmaceutical companies, leading the pharmaceutical industry, directed their resources to

this point. The availability of vaccine types and the fact that some of them are in the human trial phase are important for global health. The shares of companies in the pharmaceutical industry have gained relative value. The transmission rate of COVID-19 virus is higher than MERS and SARS. MERS 1000 has been infected in 2.5 years. This transmission period was 130 days for SARS. COVID-19 crossed this limit in just 48 days. As of 2020, 87,706 cases have been detected in China, where the virus originated. The virus basic reproduction coefficient is between 1.5-2.5. This shows that an infected person will infect approximately 1-3 individuals. The lethality of the virus is less than MERS and SARS. The number of deaths for every 50 infected individuals is 17 in terms of MERS and 5 in terms of SARS. It is 1 person for COVID-19. This number shows the death rate above 2%.

The Phase-3 Clinical Trial phase for the treatment of COVID-19 is expected to be completed at the local vaccination point in April 2021. On the one hand, while entering the clinical trial phase from domestic vaccine studies, on the other hand, methods that can treat the minimum symptoms of the disease continue to apply. Moderna and Johnson & Johnson are working on prophylactic vaccines. GlaxoSmithKline, one of the world's largest vaccine manufacturers, announced that it will open a new vaccine production technology to other companies. Vaccines have been produced in the short term within the framework of all efforts (https://assets.kpmg/content/dam/kpmg/tr/pdf/2020/03/sektorel-bakis-2020-ilac.pdf)

CHAPTER 3

INNOVATION

3.1. Definition of Innovation

Innovation is one of the areas subject to more than fifty years of important work. In our country, it has become the concept that has gained popularity since the 2000s. This concept was first suggested by the economist and political scientist Joseph Schumpeter as a driving force in the development process. Schumpeter studied innovation in the content of his book "Theory of Economic Development" (Theorie der wirtschaftlichen Entwicklung), written in German in 1911 and translated into English in 1934. In the book in question, he explained the concept as providing a product that consumers are not aware of yet or providing modern features to an existing product, contemporary production stages, creating a modern competitive environment, providing a modern resource for raw materials or semi-products (Elçi, 2008).

3.2. Objectives of Innovation

In today's very severe market conditions with rapidly changing technologies and types of economic uncertainty, it is not surprising that innovation is a desired goal by all people. Innovation as a word alone describes developing, introducing something new and moving forward. In the working life, where there are many aspects of what is desired, administrators are under pressure to produce the best, faster, less expensive. In these difficult conditions, innovation is a phenomenon that can enable companies to take the leadership of the competitive environment and provide a significant improvement. Improving product quality is one of the primary aims of companies to engage in innovative activities. Increasing profitability of these innovative products is a driving force for companies. Within the scope of the

idea that the main purpose for a company is to generate income, it is a tool that can turn this idea into reality, and innovation is of great importance in terms of maintaining this situation and providing long-term profit and progress. Apart from this, in certain cases, innovation constitutes the breaking point regarding the future situations of the companies (Van Dijk, 2002).

3.3. Types of Innovation

When companies take actions within the framework of these objectives (depending on their importance), they accept and evaluate the resources of the enterprise, consumers, machinery and equipment suppliers, fairs, promotional activities, raw material, semi-finished products and parts suppliers as data providers (Ozan, 2009).

In the pharmaceutical industry, there are three main types of innovations (Şimşek & Kılıç, 2012):

1. **Incremental innovation:** New dosage forms and new formulations.
2. **Stepwise innovation:** Different molecules belonging to the same chemical family, offering different options in terms of indication, side effects and drug metabolism.
3. **Breakthrough innovation:** An innovation or new active ingredient that brings a brand new approach to a disease.

Incremental innovation is an essential element for pharmaceutical discovery. The vast majority of drugs that have been developed and considered clinically important in the last 50 years have emerged as a result of development processes involving multiple, small and successful advances in the same pharmacological class (Yasin, 2002).

Finding a new molecule in the pharmaceutical industry is actually a starting point for both reference and generic pharmaceutical companies. The product should be expected to move forward from this starting point over time. In the process of product development, the competition between generic pharmaceutical companies and reference pharmaceutical companies should continue (Cutter, 1992).

When promoting pharmaceutical innovation, care should be taken to ensure that this does not result in prolonging the life cycle of the reference drug and protecting it from competition from equivalent alternatives with modifications that do not provide any improvement in current therapy. For pharmaceutical innovation to express value, it should provide additional therapeutic benefits to the patient compared to its therapeutic alternatives, in other words, it should increase the relative efficiency (Günay, 2007).

3.4. Importance of Innovation

Today costs are not considered to be the only advantage in the market. There are multiple elements such as the speed of response according to the requirements of the competition conditions, shortening of the expiry dates of the products, quality in products and services, designing, ensuring the development of modern product and service types, product and service production according to consumer demands, modern management and organizational model types. These outweighed the costs in terms of importance. Therefore, all these factors require innovation (Elçi, 2008).

The vital importance of innovation has been explained as follows in the policy documents published by the European Commission at the end of 1995 with the aim of investigating the factors affecting innovation in EU states and developing recommendations to increase the innovation capability of the EU. Innovation realizes the fulfillment of personal and social needs in better conditions. Innovation is fundamental to entrepreneurship. Every modern enterprise is often seen as the result of a process of introducing a specific innovation. More than that, all businesses need constant renewal in order to maintain their strength in the market. The statements in question are correct for states. In order to maintain their economic expansion, market forces and employment opportunities, states have to quickly turn contemporary ideas into technical and commercial success (Göker, 2003).

The competitive advantage of the businesses will cause them to gain price and quality superiority against their competitors in the market. In this regard, the main changes in the industry and competition structure are due to

innovation. In addition, the differences and innovations seen within the structure of information processing and communication technology have caused consumers to have information and to ask companies more than products. In terms of companies, these types of innovation have turned into tools that support the demands of consumers (Güleş and Bülbül, 2004).

Innovation has come to the aid of some companies that have a leading position in Turkey and in the world market. For example, thanks to the packaging, it has developed, that protects the 7-layer and liquid food varieties from external influences and increases the time to stay on the shelves, Tetra-Pak business of Denmark is at the leading business point in the world in its sector. Likewise, which, at most, the number of patents in Arçelik with the most number of patents in Turkey , has become 101th in the the World list and has industrial design product award of 2005 with Turkish Coffee Maker Telve. The product has supported the competition with its use and innovation. The factors that make innovation important for a business can be listed as follows (Tunç, 2007):

- Demand for increasing income and efficiency, reducing expenses
- The desire to be effective and effective organizationally, to increase its performance,
- The need to adapt to market conditions and the pushing forces of rival businesses
- To benefit from market opportunities that arise,
- To develop and expand the organization in terms of quality and quantity,
- To improve production and components,
- To adapt the organization to its conditions,
- Maintaining and maintaining the organization
- To adapt to change or to differentiate,
- To create options against possible risks and uncertain situations caused by the changing economic, social, social, political system,
- To be a drag in social life and society,

- Being a development leader in the society,
- Meeting social responsibilities and ethical rules,
- Meeting the expectations of social life,

The reasons that show innovation or the need for innovation and its importance can be external and internal. When the reasons are investigated for the company, the topics can be listed as to be innovative and to continue innovation, to be able to choose from a rich product variety, to desire and hope to increase the income of the organization, to raise the level of organizational morale and to prepare the conditions for revealing new things in terms of innovation, to employ talented employees, to realize and to provide motivation. Market-related reasons and social reasons are expressed as external reasons. Reasons related to competition are listed as the desire to be a leading company and to protect its leadership, to be superior to rival companies, to become a monopoly. There are social reasons such as predicting the differentiation that consumers expect, ensuring the government to see the firm as beneficial, and making the state feel that the firm has a sense of social responsibility. Generally, a company's desire to grow as reasons for producing innovation, marketing strategy, obsolescence of current product types, resource utilization, competitiveness, technological advances are indicated as reasons (Açıkdilli, 2007).

As a result, businesses face various difficulties. With the rapid development of technology, increasing dependence on the successful functioning of intellectual capital, increasing the efficiency of the use of natural resources, meeting different customer needs, the development of globalization and the concentration of industrialization, advanced countries should support especially the development of sustainable small firms, and innovation (Binicioğulları, 2008).

3.5. Innovation Related Concepts

The concepts related to innovation are explored in detail below.

Innovation and Knowledge Relationship

Data constitutes the basis of innovation, and innovation is the basis of data. In this respect, organizational actions can be shaped by including the use and flow of information in the production process. Knowledge production is indispensable for innovation. "In order to be innovative, it is necessary to increase the information capacity and to evaluate the information widely in an organization" (Demirel & Seçkin, 2008).

Technology can be defined as the information that individuals consult to benefit during production. "Technology is not a means that penetrates the system of the product that is produced exclusively. It is the information set that increases the production rate, increases the quality level, makes the shape and feature different, and in short, supports the meeting of individual needs in the best way "(Eren, 2003).

One of the first concept types considered in connection with innovation is the technology concept. Technology is linked to showing what is not knowledge by realizing innovation, enabling the development of those who have knowledge and using them in contemporary designs and stages (Acaray, 2007).

There are striking lighting in the comparison of innovation and technology. While technology manifests itself in the form of discovering or revealing the totality of contemporary knowledge, culture, methods and stages that do not exist, innovation is also in the form of making the existing technology different and ensuring its development, and furthermore, a synthesis is realized by combining the two technologies found ... "(İmamoğlu, 2002).

Innovation and Invention Relationship

The concept of innovation can be defined as product, invention, which did not exist before, or it can be examined as realistic changes that occur in the product or process. Innovation and invention are like two concepts that overcome each other's shortcomings, but invention is separate from the innovation process in more than one way. In order to talk about innovation, the invention should be applicable. In other words, invention, however, can

be named as innovation since it shows a functional state (Demirel & Seçkin, 2008).

Innovation and Creativity Relationship

Creativity and innovation are two related concepts, but they do not have similar meanings. While creativity explains thinking about things that are presented for the first time, innovation should be stated as realizing and implementing contemporary phenomena. Creativity is the starting center in the formation of innovation by forming contemporary ideas or developing modern perspectives. If there is no field of application of the ideas that put forward something new or if they have not been put into practice, it is not mentioned to be explained individually. According to Heap, creativity is the ability to make connections between the data found, to reveal new connections, new ideas and new experiences. While showing new ideas with creativity, innovation shows itself as a result of putting them into practice. Creativity includes diversity of thought, while innovation explains the unification of different ideas. Increasing creativity in organizations is also increasing in innovation. Creativity is a positive value for companies to adapt to various environmental conditions and a savior factor in terms of being less affected by negative situations. Organizations must accept and nurture creative ideas in order to be more innovative (Ozan, 2009).

The Relationship Between Innovation and Invention

Inventing is doing the similar thing by another method by destroying the verdict of something that already exists. One of the concepts that innovation is close to is inventing. Innovations are based on inventions. The transformation of invention into innovation can be realized by turning it into a theory and increasing the productivity level.

Invention and innovation are types of concepts that make up for each other's shortcomings. In order to talk about innovation, it is necessary to find the application of the invented thing possible. It is wager that types of inventions can be made by free individuals, as well as manifest as a result of organizational endeavors. In the inventive endeavors, activities towards the

application of materials, processes or the current product in other fields are carried out. When certain types of inventions are first discovered, it may not be clear exactly what they will be used for and for this reason it may be difficult to commercialize. However, if, over time, the invention can become ready for use by interacting with some other things, then its transformation into an innovation is a matter of question (Ozan, 2009).

Innovation and R&D Relationship

In other words, R & D It is defined as systematic studies in order to provide up-to-date data that will make progress in science and technology, to produce current materials, products and tool types with current data, to produce software, to reveal the current structure, the whole of stages and types of services, or to provide the development of the existing ones. (Zerenler, Türker, & Şahin, 2007).

R&D is a process that is carried out to provide data that is not available or to consider what is found, and requires the information to be gathered, analyzed and interpreted regularly (Acaray, 2007).

The effect of R&D on innovation is emphasized in more than one study. In these studies, it is concluded that R&D expenses are the determinants of innovation activities. R&D is considered as one of the essential essential elements in terms of more than one type of innovation, primarily innovation in technology (Sungur & Keskin, 2009).

R&D includes the subjects such as introducing modern technologies with the purposes of reducing expenses or making improvements over the standards, activities aimed at ensuring the development of modern product varieties, and actions for rehabilitation on existing products. Innovation is the result of R&D research. R&D researches are carried out by private enterprises, university types, state businesses and businesses across countries. An innovation that manifests itself as a result of evaluating an idea with R&D researches is observed and continues with the patent acquisition process.

While science and technology are the inputs of innovation, the development of innovation is provided with R&D studies. The types of investments to be

made in R&D are very important. Along with this situation, research and development activities that cannot be transformed into an economic benefit turn from an investment situation to a more expense characteristic (Onağ, 2009).

When it comes to innovation actions in today's companies, research and development studies are seen. R&D reviews play an important role in the innovation stages. However, starting from the center in question, it is wrong to accept all innovation actions as a set of stages that manifest themselves as a result of R&D examinations. More than one of the innovation activities manifests itself in joint work with high-level employees, other companies and government enterprises. Innovation is an inclusive concept and includes R&D activities (Şahin, 2004).

However, if the type of innovation related to the enterprise, in other words, if the R&D performers do not have an entrepreneurial feature, value cannot be revealed. R&D results cannot be translated into innovation. Therefore, innovation research, which is carried out in many different fields of activity, includes not only technological innovation but also organizational innovation and marketing innovation (Zerenler, Türker, & Şahin, 2007).

Innovation and Change Relationship

Change manifests itself in organizational conditions as it has always been found in life. Firms are experiencing changes based on their needs and expectations while ensuring the development of the whole of products, services or stages apart from the existing products. Changes can occur in a planned or unplanned way and manifest itself in the form of transformation of the environment or the whole of stages into other conditions or stages. Planned change is the company's changing or adapting its system to adapt to new situations in the face of factors such as competition, competitive environment, customers, suppliers and so on. It carries factors such as creativity, innovation, development and growth in organizational change. Innovations bring change in organizations.

In addition, the changes that take place may not be an innovation feature. Changes that necessarily manifest themselves due to environmental conditions are not an innovation. Because innovation must take place in all stages of the organization and be accepted by employees (Ozan, 2009).

The Relationship Between Innovation and Learning

The concept of learning, which has an impact on the innovation stages, is examined by psychologists, sociologists and educators and includes a wide range of disciplines. Those who examine the definition of learning have been studying this issue for years. Today, many definitions related to the concept of learning are realized, as in many subjects in the world. On the other hand, there is not a broad explanation about the concept of learning in the study, only the definition and types of learning are mentioned to take a general scope, and then the connection of learning with innovations and technological developments is shown (Sungur & Keskin, 2009).

Learning is defined as "the stages of bringing system to knowledge in relation to the personal experiences, mental systems and beliefs of individuals (Kılıç, 2004).

The closeness of the link between learning and innovation can be seen because innovation is essentially the result of learning stages. The accumulation of knowledge is seen through the data provided in the learning stages, and the new information that reveals itself causes innovations to manifest themselves by increasing the information store (Sungur & Keskin, 2009).

The Relationship Between Innovation and Imitation

Imitation is explained as something that has been laboriously realized, trying to resemble or to be likened to a sample. When the connection between innovation and imitation is investigated, it is known that a company that discovered innovation is made similar to others. For the first time, companies that make imitation do not undertake the financial and time-related expenses of the companies that provide the development of an innovation or they reduce these expenses too much. Since the imitated product is experienced

by the company that produced it for the first time, the first manufacturing company in question has to bear some risk types. Firms that imitate, on the other hand, do not undertake the risk of first experience and therefore the risk they bear is very low (Ozan, 2009).

Innovation and Competition Relationship

Developments in technology are pointed out as the starting point for international market conditions. The innovation realization of the companies and the development of new product types also strengthen the market for the nations. The market structure based on innovations is expressed as "innovative competition". Among the factors that determine the innovative market power of companies, subjects such as the command of science and technology, the level and how effectively the R&D allocation is used, the harmony of R&D activities with activities in the form of production and marketing are counted. In innovative market conditions, it is imperative to make high-level investments in R&D and to realize the intensity of science and technology. In addition to these, the attention to be paid to the subjects such as transforming the results obtained by R&D into qualified and meaningful products, training talented managers, utilizing economies of scale, paying attention to intellectual capital, making investments within the framework of different competition conditions, targeting to be a global brand and providing service after sales will increase the strength of companies against innovative market conditions (Narin, 1999).

3.6. Features of Innovation

The features of an innovation are as follows (Yeloğlu, 2007):

– **Relative Advantage:** The prestige provided by innovation, economic situation can be defined as relative advantage. Low cost innovative activities may provide a relative advantage for some, but this does not mean that cheaper in every economic aspect provide a relative advantage.

– **Suitability:** Knowing that innovation provides the benefit is defined as the appropriateness of innovation.

– **Complexity:** Refers to the complexity in the use and perception of innovation. It has a structure that varies from person to person.

- **Trial:** It refers to the dependence of innovation on scientific basis.
- **Observability:** It refers to the observability and the analyzability of the findings of innovation by others.

3.7. Reasons to Innovate

The rapidly differentiating time also rapidly differentiates the competition methods that will achieve success, and passes the fashion of what happened before. Today, innovation and marketing are the methods that will realize success and must be carried out together. Moreover, even marketing has to be found innovative, otherwise the customer will not be aware of it. For this reason, companies should set aside all work and try to solve the problem of increasing their innovation capabilities first (Kırım, 2006).

Innovation is a concept that is used together with competition in today's environment. The concept of competitiveness is defined by Porter in his book "Competitive Advantage of Nations" as the ability to increase productivity. He also mentioned the importance of innovation and product renewal as the ability to increase productivity (Porter, 2000).

OECD-Eurostat (2006) aims to rehabilitate firm performance in the form of increasing the desire or reducing the expenses, as the last result is the reasons for innovation of firms. A modern product or set of stages can provide competitive power. Types of innovation that increase the level of producibility give the firm the power to reduce expenses against its competitors in the market. Due to the aforementioned reason, the firm gains more income in the price in the market or, in relation to the elasticity of demand, it can realize lower prices / sales diversity at higher prices than other companies in the market in order to secure its place in the competitive environment and to increase the gain. In the case of product innovation, the company can provide a competitive advantage through the method of presenting a different product to the competitive environment, and therefore it can increase the demand and pricing elasticity. Companies can increase the demand by using the product differentiation method, targeting new competitive environments and affecting the demand level of existing

products. Differences in organizational procedures can rehabilitate the productivity level and quality of firms, and hence increase demand or reduce expenses. Innovation can also improve performance thanks to the firm's ability to innovate. For example, rehabilitating the capacities of production stages can make it possible to make new products, and modern organizational practice types can improve the firm's ability to obtain and create other new data that can be utilized in the development of other innovations (OECD-Eurostat, 2006).

In the long run, while other indicators of economic expansion, such as physical capital, are dependent on the law of declining efficiency, when R&D, technology and human resources are concerned, constant and increasing efficiency conditions pass. For this reason, R&D investments, the number and quality of scientists and researchers, and the culture of innovation have become one of the main determinants of sustainable growth stages in the long term (Romer, 2006).

Differentiation seen as innovation and technology has an important role in economic growth. The proliferation of investments in information and communication technology and the effects of these types of investments on productivity are among the factors that reveal the important role of technology. But when examining the recent growth performances of OECD states, it is observed that the new role of innovation is that information and communication technologies are coming to the fore at a very interval. Innovation is the essence of economic activities. In economics, companies in all sectors should realize innovation in order to meet the needs of knowledgeable customers with commercial demands and stand in the way of global market conditions (Pilat, 2002).

There is no consensus in the literature regarding the reasons for innovation. In terms of expressing that the subject is viewed from different angles, it is necessary to express the opinion of Drucker, who divides the reasons for innovation into two as originating from the enterprise and originating from outside the enterprise (Drucker, 1998, cited in Çiftçi, 2013):

a-Internal Reasons:

Reasons to innovate in-house are to be recognized as an innovation company and to do this continuously, to have a wide variety of products that can be preferred, to hope and to want to increase earnings, to ensure high morale in the company and to create conditions that are suitable for more innovation and creativity. Apart from this, there may be reasons related to the employees in the form of recruiting talented and willing employees to the company and ensuring the continuity of these people in the company, providing the opportunity for all employees in the company to enjoy their work and making sense of their work, and providing them with motivation for the work subject by getting support from them in solving the problems of the company. According to a study, the reasons for in-house innovation were listed as opening the product range under competitive conditions, ensuring the improvement of the quality of the products, finding a place in the competitive environment, and reducing expenses and increasing productivity (Kaufman, F. Tödtling, 2002).

b-Outside Reasons:

External reasons are divided into two as being related to the competitive environment and social reasons:

1. Reasons associated with the competitive environment: It relies on concerns such as being a leading company, securing its leadership, gaining superiority over other businesses in the market, being the only seller of a product in a competitive environment.

2. Social reasons: Satisfying customers that differ, proving the social benefit of the firm against the state elements, and in connection with large firms are seen as related to the skeptical society.

Considering the environmental factors related to the reasons for the companies to realize innovation, the following factors are encountered (Barış et al., 2011):

Competition: According to Schumpeter, in the economic life, the market can be found based on prices as well as at technological levels. In addition to being in the market by producing similar products with less cost, companies can compete by producing new products with new qualities and new technical capacities (Asheim, 1997).

According to Porter, competition is the study of "making choices that will perform activities in different ways or make more activities than competitors in terms of gaining more space in the competitive environment." Accordingly, the basis of the competitive situation is to present a difference. In order to obtain a place where the company can be protected within a sector and thus provide great investment return, it is absolutely necessary to make changes according to others with the competitive strategy that it provides development (Porter, 2000)

Technological Change: Firms are renewed by implementing technology types. In addition to technical renewal, it brings managerial innovations and, in a way, deems it necessary. Apart from this, it is necessary to state that in a dynamic environment, technology realizes radical changes in all classes of social life with the activation of social structures. In other words, the technological change storm can be used as an environmental pressure factor. Companies are mostly affected by this pressure factor because companies have to maintain their place in the competitive environment against rival companies. Each new technology that is bought and put into use provides a significant level of market competition to the company that uses it for the first time, and the company gains the power to make savings with the economy this situation will create. For this reason, companies should show sensitive behavior on this issue (Chan & Fishbein, 2009).

Socio-Cultural Developments: The world philosophies, needs, in short, social characteristics and social differentiation show the expectations of the group that the companies will present their products. Social differentiation is, in the simplest terms, the cultural structure, system and social behaviors of

social life change over time because no social life can stop differentiation (Bahar et al., 2011).

Multinational Enterprises: Within the framework of the definition made by Kinsey, they are investments that have permanent employees in more than one state, and are not completely under the control of a state in daily actions in relation to this quality of the system created by employees. Multinational firms are a unique type of international firms. Multinational companies are highly developed inter-country companies that have many relations all over the world, and they have a global view in decision-making and management stages (Kinsey, 1998, cited in Cauwenbergh, 2002).

In this sense, new and developed products brought in terms of multinational investment types or marketing, which are shown to states with little development, bring innovation to the said state. Because multinational companies are superior in terms of production, marketing and management structures, they produce high-quality products with less expense than local companies in the states they invest in and sell them at a low price. This situation necessitated local companies to use the technologies used by multinational companies. In summary, the innovative role of multinational firms arises from the fact that local businesses are forced to compete in the market with foreign investments that are equipped with more technological and management-related information in the same field (Taşkıran, 2004).

Innovation ensures that personal and social needs (health, rest, work, transportation, etc.) are met at a higher level. Innovation is also fundamental to the entrepreneurial spirit. New initiatives usually emerge as a result of phases towards innovation. Besides, all enterprises need continuous renewal in order to maintain their market power (Gökçek, 2007).

Today, there are no more costs that determine the advantage in the market. The speed of responding to the needs of the competitive environment, the quality of products and services, their design, the development of new products and services, the production of products and services according to consumer demands, new management and organization models are more

important than costs. All these factors make innovation imperative. It is done in this way to be included in new competitive environments, to increase the share in the existing competitive environment and to increase competition. Regardless of the sector in which the business is located and the size of the sector, all companies need to innovate (Elçi, 2008).

3.8. Effects of Innovation

Innovation is a vital task for the future of companies as a process that is simply planned, managed and adapted. But in terms of innovation, it is imperative to choose the right direction first and go accordingly. These details, which are considered simple, support the progress of the company. In order to implement innovation in the form of a company strategy, it is necessary to make a good choice of the market first. Innovation is the most important factor that reveals long-term failure if not adapted. Innovation is essential for a solid future, but it is imperative to have a mandatory team of employees. Before this situation, the competitive environment and its features are related to the compliance of the innovation with the company policy (Demir & Soydoğan, 2017).

In addition to creativity, innovation also has a destructive effect. According to Joseph Schumpeter, innovation eliminates the old production techniques of businesses as well as their old products. For example, the development of mass production systems in the 19th century caused the producers who used traditional production techniques to go bankrupt after a certain time. Many businesses and institutions that cannot act together with innovations are rapidly disappearing from the market. Therefore, an innovation has both positive and negative effects on the market (Luecke, 2008).

3.9. Pharmaceutical Sector and Innovation

Innovation, in the sense of developing a new idea and implementing it, can be done in the form of developing a product or service that did not exist before, or it can aim to make an existing product or service more useful, more useful, and more useful to people (Şengün, 2016).

Innovation in the pharmaceutical industry is traditionally seen as the field of reference pharmaceutical companies. However, generic pharmaceutical companies also operate in many different fields innovatively and invest heavily in innovations (Lal & Adair, 2014).

Innovation in the pharmaceutical industry has traditionally been seen as the field of reference pharmaceutical companies. However, generic pharmaceutical companies also operate in many different fields innovatively and invest heavily in innovations (Terzi, 2019).

Although public authorities do not encourage generics producers enough for innovative processes, generic pharmaceutical companies carry their existing products to a higher level by carrying out innovative studies that include new opportunities. However, these innovative areas, which contain new opportunities for the pharmaceutical industry, remain as areas where few companies operate and invest in the world. In this context, innovative activities create important opportunities for pharmaceutical companies in our country as well as all over the world. If the production of value-added generic drugs is supported, our pharmaceutical industry, which has a long-standing production culture and technology capacity and human resources at international standards, is in a position to achieve significant success and gain competitive advantage in the global market (Ayhan 2011).

Innovative activities carried out by generic pharmaceutical companies can be exemplified as follows: development of different dose or form of an existing product, controlled release systems, combined products, packaging systems that facilitate patient compliance, development of biosimilar drugs (Aksay & Orhan, 2013).

Things to consider while promoting innovation in the pharmaceutical industry can be listed as follows (Uzkurt, 2010):

- Value-added generic drugs that make a difference in treatment and contain innovation should be supported in terms of price and reimbursement practices.

- Some incentives should be provided for incremental innovation, which makes a significant contribution to treatment. For this reason, incremental innovation should be well defined and should not be confused with ordinary product differentiation such as different color, taste and presentation.

- A healthy balance must be established between the promotion of innovation and competition. While the incentives provided develop innovation, they should not cause new monopolies by eliminating competition.

- Policies developed for the promotion of innovation should be applied to generic pharmaceutical companies that innovate as well as reference pharmaceutical companies.

- Better links should be established between science and business.

- The quality of patents should be improved.

In recent years, pharmaceutical companies in Turkey, establishing R & D centers or improving existing R & D centers have increased their investments in this area. However, the pharmaceutical industry cannot adequately benefit from R&D support due to the scale problem. For example, in the R&D law, the number of employees required to obtain a central license should be reduced from 50 to 10, considering the structure of the industry (Akdağ, 2007).

In order to increase the R&D capacity in pharmaceuticals, methods that will enable the industry to benefit more from incentives should be implemented (UNCTAD, 2003).

One of the most important problems in the field of R&D in our country is the difficulties encountered in employing foreign R&D personnel. In order to provide know-how flow, the working procedures of foreigners in R&D centers should be facilitated and accelerated (Korkmaz, 2005).

Increasing university-industry cooperation will also make a significant contribution to the development of innovation capacity. In this framework, the curriculum taught in pharmacy faculties should be reorganized in line with the

pharmaceutical production and R&D needs. With the support of the industry, the establishment of an institute specialized in pharmaceutical R&D can also be brought to the agenda (Aslan, 2018).

Pharmaceutical companies that use traditional marketing methods are gradually trying to come up with an effective and dynamic marketing strategy by reaching the goals they cannot achieve through other channels with less cost. It is predicted that traditional marketing, which was described as costly and waste of time, which was previously made with the visits of field workers, will decrease significantly in the future with the pressure of the stakeholders. Companies have already started to compete by including departments such as Neo-Business and E-Marketing. This competitive environment created in the digital environment, on the other hand, will become more inflamed, according to Deloitte and PWC predictions (Arık et al.2016).

Companies that understand the importance of Multichannel Marketing have started to make big impacts with small initiatives. Most of these initiatives are designed for doctors to improve themselves and apply the right treatment methods. Companies like Pfizer and Novartis have apps that calculate the dosage of their own medicines. Thanks to some applications, you can even find out if there is a risk of melanoma by uploading a photo of the spots called "me" on your body. It is also very easy to measure the return on investment made in such applications and websites. With the increasing tendency of doctors to digital and changing regulations, digitalization will be integrated with the pharmaceutical industry.

3.10. Perception of Innovation

Perception's word meaning is the interpretation by passing the information, experiences, sensory organs and senses provided by individuals through their minds. Within the framework of this definition, the innovation perception can be defined as the way to recognize the innovation, the innovation experiences they see and the interpretation of people (Bakan & Kefe, 2012).

Rogers explains that, like each of the objects, innovation is first perceived by people or practitioners based on knowledge and experience. Within this

framework, the thought may arise that perception constitutes a basis (creates an outlet) to move into innovative activities, to ensure innovation and make it sustainable. However, when the literature is searched, it is understood that there is a limited number of studies related to the perceptions that constitute the starting point of innovation activities. Considering this limitation, the perception of innovation within the framework of the research has been revealed by deductions from the reasons for the companies and their employees to realize innovation, the types of innovation that have been successful, and the points of resistance against innovation. Within the scope of these inference types, the following innovation perception types have been determined (Rogers, 2003).

Perception of innovation as liberation from crisis periods: In more than one study in the literature, it is stated that crisis periods cause innovation to show itself. Again, more than one researcher expresses their opinion that innovation activities are important in getting out of crisis situations (Sabuncu, 2014).

Perception that innovation will provide competitive advantage: More than one research in the literature claims that the main purpose of innovation is to increase the competitive power of companies. It is often claimed that companies innovate for this reason. Apart from this, most of the employees think that innovation will create an advantage in competition (Öztürk et al., 2013).

Employee perception of innovation as a risk to their position: In the literature, certain findings are encountered that employees may face the danger of losing their status within the scope of the differentiation that the innovation situation will show. Employees who are in favor of innovation are generally needed in inovaston applications. However, the abilities of certain employees show competence in directing differentiation. The fact that the employee will face the danger of losing his / her position if he / she fails to succeed causes resistance against innovation (Day, 2007).

Perception that the manager cannot manage innovation: This perception, which becomes more visible when evaluated together with the perception mentioned above, is related to the idea that managers do not have the knowledge and experience at the level to manage innovation. Managing innovation requires various managerial qualities such as examining situations from various angles, assuming risk, having vision, persuading, and effectively resolving conflict forms. The fact that these qualifications are not owned by an administrator creates the perception that that administrator cannot manage innovation (Tunçer, 2013).

Perception of innovation as uncertainty: Innovation is an activity that has certain characteristics in terms of personal qualities. For example, the lack of knowledge of the extent to which the innovation-related activity will meet the consumer expectations and expectations, the lack of knowledge at what level and how to be affected by environmental differentiation (technical, political, economic). Because of the situation in question and because of the same situation, they have different types of risks, so they can usually be evaluated as uncertain by administrators (Naktiyok, 2007).

Perception of innovation as an additional cost: Innovative types of applications often feel the need for additional resource types. In other words, every different occurrence has a response. Along with the types of innovation, any differentiation to be seen in the company will have a financial cost. This situation, which will reflect in the form of additional expenses to the company's budget, has a characteristic that will negatively direct the perspective of the administrators on innovative activities (Kotey & Sorenson, 2014).

Perception that innovation will create important changes: It is the idea that the innovations that are transferred to life will not be limited to products only, will affect all units of the company and the company will face more differentiation. While the said situation disturbs major administrators and employees, it is observed that some of them are the best method to overcome the existing problems (Otara, 2011).

Perception that innovation will be resisted by customers: The aim of innovation actions is generally to direct consumers' needs and expectations. But it is an expected point that consumers will not be able to easily accept every single innovation. Managers have concerns that should be taken into account in this regard. This situation has the potential to negate the perceptions of administrators related to innovation (Day, 2007).

Perception that innovation will meet resistance from staff: Employees are very important in adapting and continuing innovation activities to life. Employees' perception of the innovations as a danger to themselves may negatively shape the views of the managers towards innovative activities (Lambert and Hogan, 2010).

Perception that innovation will improve product quality: One of the goals of the realization of innovation activities is to produce products in a more qualified and efficient method. It is expected that administrators have such an opinion will guide their perceptions related to innovation positively (Naktiyok, 2007).

3.11. Innovation Process

In order for innovation to be applied successfully in the enterprise, the innovation strategy must be integrated with the corporate strategy. The innovation process concerns all of the business employees. This means that all employees, from the business manager to the employee, support the production of innovation. In the innovation process, innovation is not produced solely on the subject of the business or its being an entrepreneur. The innovation process emerges with the support of all managers and employees of the enterprise (BTSO, 2007).

Various variables are involved in the innovation process. The strengths of businesses are derived from internal and external sources. These forces may vary depending on the characteristics of the new product or process produced. These variables are consumer expectations, competition conditions, company opportunities, sufficient efficiency, whether managers want innovation and management of external resources. The success or

failure of innovation implementation is the result of all these variables. The success of innovation depends on the use of these variables by the business, and its failure is the result of not using the variables. In this case, the business will enter the process of relearning or quitting (Güravşar Gökçe, 2010).

Phases, periods, elements and main functions in the literature are process models associated with innovation. The first stage in the examination of these types of models is to identify the idea, need or problem. Putting forward innovative thoughts is the second step. In the third phase, the prospect of success is examined and developed. This means transforming an idea into a product, process or service.

This phase is also investigated as the integration phase. At the last stage of innovation, the thought produced is presented to the competitive environment. These stages carry out an advanced analysis of the innovation process. In this way, what is required in terms of innovation is followed in detail (Yılmaz, 2015).

The innovation process is determined within the framework of certain characteristics of the companies. The types of variables such as the values, strategies and priorities of the companies associated with innovation show themselves in the determination of the said process. The effective implementation of the innovation process in the companies provides improvement in the administrative departments, working model and policies of the companies. Johnston and Bate (2003) state that innovation is to be carried out strategically, that it is competitive-centered, that it demands preparation from the present for the future, that creativity, being transparent despite diversification, and revealing innovation are essential (Demirel & Seçkin, 2008).

3.12. Rogers's Theory of Spread of Innovation

Rogers's Diffusion of Innovation Theory (1995) is a widely accepted theory in innovation practice studies. The Theory of Diffusion of Innovation is a

complex theory aimed at obtaining data related to innovation adaptation stages and reducing uncertainty (Agarwal, Ahuja, Carter, & Gans, 1998).

The theory explains acceptance or non-acceptance of innovation by showing the qualities of how innovation is understood as predictors of adaptation similar to other adaptation theories (Park, 2004, Berger, 2005). In this respect, it provides a useful perspective in integrating and using the ever-developing pharmaceutical production technology.

Rogers (1995) theory defines innovation as "a thought, practice or phenomenon that the person or organization perceives as new". Innovation does not need to be in the form of an unrecognized concept or regulation without prior knowledge. It is accepted that the individual or the organization did not use innovation before (Berger, 2005). However, innovation can be in the form of providing alternative solutions to problems in order to meet the needs of individuals or organizations, as well as different methods of understanding the problem or need (Rogers, 1995). From this point of view, innovation can also be defined as a different product, technology, view or analysis method for individuals or organizations. The stages of transferring innovation between members of a social structure over time through certain channels are defined as spreading. Four elements of diffusion have been defined by Rogers (1995) as innovation, communication channels, time and social system, and these elements are explained in detail below.

Innovation: As a result of the understanding of knowledge, this element becomes operational and then ends with adaptation or non-acceptance of innovation (Rogers, 1995). There is a transfer of knowledge that there is an element of innovation in those who adapt to social structures. In these stages, those who support adaptation in the potential situation show information tracking behaviors that aim to learn the results of evaluating the innovation (Agarwal, Ahuja, Carter, & Gans, 1998).

Within the scope of Rogers's (1995) model, five phases are passed in the decision to comply or not to accept innovation. These stages are information seeking and information processing. Basically, these five stages are

information, persuasion, decision, application and verification, in which quinine tries to obtain information that will help reduce uncertainties about innovation in quantity. In the first phase, the person is informed about innovation and functions. He shapes his attitude towards innovation by comparing the beneficial and detrimental aspects of the innovation situation in his conviction phase. At the decision stage, the person obtains additional data related to the innovation and accepts or does not accept the innovation. At this stage, the person is particularly affected by the evaluations made by the people in his environment. In the implementation phase, it is realized when the decision to comply with innovation is taken. In the last stage, the person confirms and reinforces the compliance.

Communication channels: The second essential element of the diffusion phase is the transmission of innovation messages from person to person through communication channels (Rogers, 1995). Interpersonal communication channels are more effective than formal communication channels in shaping and differentiating innovation attitude, thus accepting or not accepting innovation. While many individuals accept the adaptation to innovation, they act according to the opinions of the people in their environment rather than the research and recommendations of the expert individuals (Argabright, 2002; Chapman, 2003).

Time: The time element explains the stages of adaptation and the amount of adaptation (Cegielski, 2001). According to Rogers (1995), changes in the level of adaptation of individuals to the novelty situation are in question. These changes arise from the acceptance of the innovation. The time of acceptance is the distance between the individual noticing the novelty and accepting or not accepting it. Acceptance time describes the approximate time required for the adaptation of the individual to the innovation and is an important concept in terms of the prevalence of innovation.

If the acceptance period of the person is low, it is thought that the widespread use of innovation will accelerate. Apart from that, the acceptance period is a relatively innovation and decision-making phase. The stages of becoming

new and making decisions are a mental stage that continues from the first information about the innovation state to shaping his attitudes towards innovation (Argabright, 2002).

Innovation qualities that support the explanation of the speed of accepting a new idea are detailed below as relative advantage, complexity, suitability (compatibility), testability, observability. Rogers (1995) stated that the characteristics of innovation and the phenomenon of innovation are the features understood by the person.

Relative advantage is the level of appreciation of the benefits of the state of innovation over the thought or technology it replaces. As the benefit of the novelty situation understood by the person increases, the amount of adaptation will also increase. When the idea that a state of innovation is better than its previous state, it is understood as useful for the target group (technical, economic, physical (better opportunities) or place in society, etc. (Rogers, 1995) .The level of relative advantage can be measured in economic terms, but social reputation, convenience and satisfaction are also very important factors (Park, 2004).

Conformity is the level of compliance of the innovation situation with the values, experiences and needs of potential adapters. As the new state meets the needs of the person, the amount of adaptation will increase (Rogers, 1995). If an innovation is deemed appropriate to the current situation of the person, the person will feel less uncertainty associated with the innovation. In this case, the least possible education or attitude differentiation becomes necessary; in this way, adaptation can become easy (Chakravarty & Dubinsky, 2005).

Complexity is the level of understanding that one's innovation is difficult. Complexity is negatively related to the amount of fit. Easily understood, adaptation to innovation is faster (Rogers, 1995).

If innovation is complex, potential adapters will not have sufficient data, skills and experience to assess this situation. A complex innovation necessitates training for potential adapters. At this point, the complexity level of the

innovation state decreases and adaptation accelerates (Chakravarty & Dubinsky, 2005; Jansma, 2003).

Trialability (Ease of Experimentation) is a measure of the ability of the adaptable individual in the potential situation to experience innovation. Being able to use a thought or technology on the basis of experiencing it increases the possibility of adapting to the innovation situation of the potentially adaptive (Rogers, 1995).

Observability is the measure of being monitored by the people in the environment as a result of the use of the innovation state and transferred to other people (Rogers, 1995). The results of certain types of innovation can be traced and transferred more easily than others.

Social System: The fourth element is the social system, which are sequentially disconnected units assembled to achieve a goal. All social structures that have undergone structuring have norms. These norms create behavior types for members of the social system. Norms show social system members how to act. Often, types of norms work as a barrier to the widespread use of innovation (Cegielski, 2001).

CHAPTER 4

METHOD

In this section, the purpose and scope of the research, question and model, rationale and analysis level and research method are included.

4.1. Methodology

This study examines the role of product innovation in the pharmaceutical industry and the impact of innovation on competitiveness according to the variables of innovation in business, participation in innovation thinking and competitiveness in business. In the light of these distinctions, a basic research question has been created. The effect of product innovation role on competitiveness has been tried to be examined. Depending on the following basic research model, in this study the dependent variable is competitiveness in the company, and the independent variables are innovation in the company and participation in innovation thinking. This research design is shown below in Figure 3.11. In addition, research questions are also specified in the same section.

Figure 3.10. Research Design and Dependent and Independent Variables

The detailed research question regarding the mentioned research is expressed as follows.

- Does product innovation in the pharmaceutical industry have an impact on competitiveness?

4.2. Research Population and Sample

The analysis level of this research is individuals. The survey was conducted on the employees of pharmaceutical companies operating in Bursa province. The opinions of pharmaceutical company employees on the impact of product innovation on competitiveness in the pharmaceutical industry form the basis of the study. In this context, it has been investigated whether there is a difference in the effect of product innovation on competitiveness in the pharmaceutical industry within the scope of the demographic information of the employees. The rationale for the research area being conducted in pharmaceutical companies is to investigate whether product innovation has an impact on competitiveness. Bursa pharmaceutical industry because it is made in the company of this research is advanced to be one of Turkey's largest city and health business. The population of the study, according to official records, employing approximately 40,000 people, the sector mainly operates in the Marmara Region (KPMG,

https://assets.kpmg/content/dam/kpmg/tr/pdf/2020/03/sektorel-bakis-2020)
107 employees from Bursa pharmaceutical companies were reached.

4.3. Research Method

In order to determine the effect of product innovation on the competitiveness of pharmaceutical companies operating in Bursa province, a questionnaire, which is one of the primary data collection methods, was prepared first. The scale prepared for the research consists of three parts.

In the first part, determining the demographic characteristics of the employees, gender, year of birth, educational status, position in the company, professional experience period, age of the enterprise, annual turnover of the enterprise, the number of employees in the enterprise, the sector in which the enterprise operates, the documents owned by the enterprise, the legal structure of the enterprise. and questions about the basic market structure of the business. In the second part, the questions of "Participation in Innovation Thought Scale" and Innovation in Business Scale are included.

Quantitative research methods were used in this study. In quantitative research, it is a type of research that can be monitored, measured and expressed numerically by making facts and cases objective. In the quantitative research method, the direction of the idea of the research universe about the research subject is questioned. In other words, it is not an intense analysis about the subject, on the contrary, it is determined more superficially more numerical data (Kafadar & Akman, 2014).

Approval was obtained from the pharmaceutical companies operating in the city of Bursa in order to put the questionnaire into practice. Later, the reliability and validity analysis of the questionnaire questions were made. SPSS 23.0 package program and Windows computer program were used for analysis. The questionnaire forms consisting of 58 questions in total were delivered to 107 people consisting of pharmaceutical company employees. In all statistical analyzes, 0.05 significance level was taken as a basis.

4.4. Limitations of the Study

- The research was applied only to those working in Bursa city pharmaceutical companies.
- Employees of the firm who did not accept to fill in the questionnaire while collecting data for research were persuaded.
- The research is limited to 5-Likert scale survey questions. The questions are not exceeded. Semi-structured and meaningless questions were prepared in a clear language that were not included in the questionnaire.
- In order to determine the survey participants, the number of employees in the pharmaceutical sector companies in Bursa province was determined.

4.5. Collection of Data

In the study, a questionnaire form was designed to be applied to Bursa pharmaceutical company employees. Survey questions consist of (1) general questions consisting of the demographic information of the participant, (2) questions about participating in innovation thought, (3) questions about innovation in the business, and (4) questions about competitiveness in the business, based on a 5-point Likert scale. 5 of the questionnaire questions are demographic, 8 of them are competitive in business, 17 are participating in innovation thinking and 28 are innovation in business. A Likert type rating of 1 to 5 is used. The questionnaire form was written by one of the students of Niğde University, Institute of Social Sciences, Department of Economics. It has been prepared by quoting from the master's thesis titled "The Importance of Innovation and Innovation in SMEs: The Case of Kayseri Province", which Assoc.Dr. Fatih Yücel advised. Participation in Innovation Thinking Scale ", " Innovation in Business Scale "(OIC) and Competitiveness in Business questions were included.

> *"These questions are thought to measure attitudes and perceptions towards innovation in the business. Since the survey is applied to the*

business managers, the respondents will answer these issues by considering the current situation in their business. This means measuring perceptions towards innovation. However, since these people are managers, they are also people who carry out the innovation management necessary for the realization of innovation in the business. Therefore, questions also measure attitude. In light of this situation, it was predicted that the questions of Part 2 and 3 of the survey indicate how successfully the enterprise has implemented innovation management. However, since the attitudes of managers towards innovation are also measured, it can be predicted that these questions give information about the current innovation levels in the enterprise.

"In this study, by considering all the innovation indicators, an innovation degree for the company has not been taken. However, the measured attitudes and the innovation indicators of the business give an idea about this issue. In the past, in Turkey, related to the determinants of innovation to identify and examine the relationship has been demonstrated in many studies. For this reason, in this study, tests were not used with all innovation determinants. Another reason is that the turnover symbolizing the financial size, the export and import figures representing the relations of the enterprise with international markets, and the data obtained regarding the R&D investments are not very reliable. At this point, the fact that businesses consider this type of data as a trade secret and do not want to share it played a role. (Yapar, 2015)

It was understood that the researcher did not perform the validity and reliability analyzes within the framework of the above statements, and as can be seen in the findings section of our study, the Cronbach's Alpha value of the Scale for Engaging in Innovation Alpha value was determined as 0.198.

4.6. Statistical Analysis Used in the Study

While analyzing the data collected in the study, the statistical solutions of the data obtained from the survey results were made with the SPSS 23.0 package program and a Windows computer program. First, socio-demographic variables are grouped. In data analysis, 0.05 significance level was taken as basis. All the analyzes disclosed are interpreted in accordance with their purpose. While analyzing the data, a reliability analysis was made for all the scaled questions. Cronbach's Alpha (α) analysis was applied to the scales. Frequency, independent sample T test, ANOVA, correlation and regression analysis were performed for all scales.

CHAPTER 5

FINDINGS

The data collected by the participants of our research using the scale are available in the form of analyzes in this section in terms of solving the research problem. Explanations and comments based on the findings provided were carried out.

5.1. Socio-Demographic Findings Regarding the Employees Participating in the Survey Application

The socio-demographic information of the employees participating in the survey is included in this section.

Table 5.1.

Distribution of the participants of the researched companies by their demographic status

	Number (n)	(%) Percentage
Gender		
Female	35	32,7
Male	72	67,3
Yaş		
17-26	14	13,1
27-36	43	40,2
37-46	46	43,0
47-57	4	3,7
Avarage Age	**26,26±7,58**	**Min.10 Max. 40**
Education status		
High School	11	10,3
Vocational School	21	19,6
University	58	54,2
Postgraduate	17	15,9
Position in business		
Senior manager	9	8,4
Middle manager	34	31,8
Senior executive	13	12,1
Others	51	47,7
Professional experience period		
0-1 years	8	7,5
2-4 years	16	15,0
5-10 years	29	27,1
11-15 years	36	33,6
16 and over	18	16,8

In Table 5.1, the distribution of the participants according to their demographic status is given. Table 5.1. When analyzed, 32.7% (n = 35) of the employees included in the study were female, 67.3% (n = 72) were male, and 13.1% (n = 14) were 17-26 by age. age, 40.2% (n = 43) 27-36 years old, 43.0% (n = 46) 37-46 years old, 3.7% (n = 4) 47- Between the ages of 57, 10.3% (n = 11) High school, 19.6% (n = 21) Vocational School, 54.2% (n = 58) University, 15%, Nine of them (n = 17) are graduate graduates. According to their position in the business; 8.4% (n = 9) lower level manager, 31.8% (n = 34) middle level manager, 12.1% (n = 13) senior manager, 47.7% ' si (n = 51) other employees, 7.5% (n = 8) between 0-1 years, 15.0% (n = 16) between 2-4 years, 27% according to their professional experience, 1 (n = 29) was between 5-10 years, 33.6% (n = 36) was between 11-15 years, 16.8% (n = 18) was 16 years and over.

Figure 5.11. Gender distribution of the companies surveyedIn Figure 5.12, it is seen that 67.3% of the employees participating in the survey are men and 32.7% are women.

Figure 5.12. Year of birth of the participants of the research companies

Figure 5.13 shows that 14.2% of the employees who participated in the survey were born in 1979 and 10.2% in 1991.

Figure 5.13. Year of birth of the participants of the research companies

In Figure 5.14, it is seen that 42.9% of the employees participating in the survey were born in the period 1971-1980, and 40.1% in the period 1981-1990.

Figure 5.14. Educational status distribution of the participants of the research companies

In Figure 5.15, it is seen that 54.2% of the employees participating in the survey are university graduates.

Figure 5.15. The distribution of the participants of the researched companies in the business

In Figure 5.16, it is seen that 47.6% of those participating in the survey work in other positions in the enterprise.

Figure 5.16. Occupational experience time distribution of the companies surveyed

In Figure 5.17, it is seen that the professional experience of 33.6% of the survey participants is 11-15 years.

5.2. Reliability Analysis Results for Key Dimensions

The items of the scales used in the research were made using Cronbach's Alpha reliability analysis. In the evaluation criteria of Cronbach's Alpha coefficient, the scale; $0.00 \leq \alpha < 0.40$ is not reliable, $0.40 \leq \alpha < 0.60$ is low reliability, $0.60 \leq \alpha < 0.80$ is highly reliable, $0.80 \leq \alpha < 1.00$ is highly reliable.

Reliability analyzes of the Innovation Thought Participation Scale and the Innovation in Business Scale and competitiveness in business were given in the study.

5.2.1. Reliability Analysis of the Scale of Participation in Innovation Thought

Table 5.2.

Reliability Analysis of Scales

Scale Name	Cronbach's Alpha	N of Items
Participation in Innovation Thinking Scale	,975	17

As a result of the analysis, the Cronbach's Alpha value of the Scale of Participation in Innovation Thought (IACI) was determined as 0.975.

Table 5.3.
Reliability analysis results of the expressions of the Innovation Thought Scale

No	Statements of the Scale of Participating in Innovation Thought	Cronbach's Alpha
1	Our business has sufficient technological infrastructure where they can easily access information about the company and the sector.	,978
2	Training and development activities are carried out for employees in our business.	,973
3	Our business has an innovative culture (like being open to innovation).	,973
4	In our business, there has been a change or increase in the range of products and services since the last 5 years.	,974
5	In our business, attention is paid to the fact that people are innovative and creative in recruitment.	,973
6	Our business makes changes (to increase sales) in product packaging, design and price.	,975
7	Our business has introduced new products / products and services / services to the market in the last 5 years.	,973
8	Our business has clear goals / targets for innovation.	,973
9	Since the last 5 years in our business, we have been in production, supply and distribution etc. new methods are used in processes.	,972
10	In our business, innovations have been made in production tools (new machinery purchase, etc.) in the last 5 years.	,973
11	High-tech tools and equipment are used for the products produced in our business.	,973
12	We have an employee in charge of R&D or innovation management in our business.	,974
13	The technological knowledge and capabilities of our business are sufficient to solve the problems that arise.	,973
14	Great efforts are made in our business to develop new products.	,973
15	Not only the research and development department, but all departments are jointly responsible for innovations in our business.	,973
16	When a new proposal comes up, the managers do not give an effort and discouraging answer such as "we have tried this before", "not this" and "this is ridiculous."	,974
17	Managers expect employees to produce new ideas, solutions and inventions in their work.	,974

Considering that the Alpha coefficient is 0.978 in Table 5.3, it is seen that the scale has a high reliability. Even if they decrease with a slight difference in reliability in variables, this difference is acceptable with an optimistic approach. For this reason, these variables can be included in the scale. Therefore, there is no need to exclude any variables from the scale and the reliability of the scale is high.

5.2.2. Business Innovation Scale Reliability Analysis

Table 5.4.

Reliability Analysis of Scales

Scale Name	Cronbach's Alpha	N of Items
Innovation Scale in Business	,950	28

As a result of the analysis, the Cronbach's Alpha value of the Innovation in Business Scale was determined as 0.950.

Table 5.5.
Reliability Analysis Results of Innovation Scale Expressions in Business

No	Innovation Scale Expressions in Business	Cronbach's Alpha
1	Our business adopts original and innovative issues developing in the market.	,947
2	Innovative production can only be done by the best companies.	,949
3	Innovation can be done in the area of expertise of businesses	,948
4	Understanding or implementing innovation is complex.	,950
5	Innovation is essential to improve product quality.	,947
6	Innovation is required to increase the product range.	,948
7	Innovation is necessary to reduce costs.	,949
8	Innovation is necessary to create new markets.	,949
9	Innovating involves economic risk.	,950
10	It is costly to innovate.	,949
11	There is no necessary funding source for innovation.	,951
12	There are no qualified personnel required to innovate.	,951
13	Changes, new ideas and inventions cannot be dealt with, as there is difficulty in its implementation.	,951
14	Our company quickly responds to the moves of competitors that threaten our company.	,947
15	We constantly collect information on competitors' strategies and activities.	,947
16	Senior management periodically discusses the strengths and strategies of the competitors.	,947
17	While determining our strategy, we focus on producing products that will create added value for our customers.	,946
18	The main goal of the business is customer satisfaction.	,948
19	The main goal of our competitive strategy is to understand customer needs.	,946
20	While determining our strategy, we focus on how we can produce more valuable / beneficial products for our customers.	,946
21	We measure continuously and systematically how satisfied our customers are with us.	,947
22	We pay great attention to the quality of after-sales services.	,947
23	The functions and activities of all our units are coordinated with each other to serve the needs of the market.	,947
24	All units of our business are sensitive to each other's demands and needs.	,948
25	All units of our business transmit all their market-related information to each other.	,947
26	All of our units and managers know very well what should be done for customer satisfaction.	,947
27	There is strong coordination among the units that gives us a competitive advantage.	,946
28	Our company considers producing and introducing new products to the market as the basic strategy.	,947

Considering that the Alpha coefficient is 0.951 in Table 5.5, it is seen that the scale has a high reliability. Even if they decrease with a slight difference in reliability in variables, this difference is acceptable with an optimistic approach. For this reason, these variables can be included in the scale. Therefore, there is no need to exclude any variables from the scale and the reliability of the scale is high.

5.2.3. Business Competitiveness Scale Reliability Analysis

Table 5.6.

Reliability Analysis of Scales

Scale Name	Cronbach's Alpha	N of Items
Competitiveness in Business	,198	8

As a result of the analysis, Cronbach's Alpha value of the Company's competitive power has been determined as 0.198.

Table 5.7.
Reliability Analysis Results of the Expressions of Competitiveness in the Enterprise

No	Business Competitiveness Scale Statements	Cronbach's Alpha
1	Business age	-,052[a]
2	Annual turnover of the business	-,003[a]
3	Number of employees in the business	-,045[a]
4	The sector in which the business operates	,619
5	Which of the following documents does the business have?	,344
6	Does the business export?	,286
7	Legal structure of the business	,055
8	Basic market structure of the business	-,003[a]

Considering that the Alpha coefficient is 0.198 in Table 5.7, it is seen that the scale has low reliability. Even if they decrease with a slight difference in reliability in variables, this difference is acceptable with an optimistic approach. For this reason, these variables can be included in the scale. Therefore, there is no need to exclude any variables from the scale and the reliability of the scale is low.

5.3. T Test and Variance Analysis

Table 5.8.

Comparison of Scores of Participation in Innovation Thinking, Innovation in Business and Competitiveness in Business According to Gender of Employees

Scales	Gender	n	$\bar{x}$	s	t	p
Participating in Innovation Thinking	Kadın	35	40,99	21,88	-,841	,402
	Erkek	72	44,51	19,50		
Innovation in Business	Kadın	35	52,66	10,85	-1,417	,159
	Erkek	72	49,45	11,05		
Competitiveness in Business	Kadın	35	31,00	5,09	-,462	,645
	Erkek	72	31,59	6,75		

*$p<0,05$

As can be seen from the table above, the average level of participation of 35 female pharmaceutical company employees participating in the study was (40.99 ± 21.88), while the average level of participation of 72 male pharmaceutical company employees who contributed to the study was (44.51 ± 19.50). Male pharmaceutical company employees have a higher average to agree with innovation thinking.

While the average of 35 female pharmaceutical company employees participating in the study on innovation in the business was (52.66 ± 10.85), the average of 72 male pharmaceutical company employees who contributed to the study was found to be (49.45 ± 11.05). The average of women pharmaceutical company employees on innovation in the business is higher.

While the average of 35 female pharmaceutical company employees participating in the study was (31.00 ± 5.09), the average of 72 male pharmaceutical company employees who contributed to the study was (31.59 ± 6.75). The average of male pharmaceutical company employees' view of competitiveness in the business is higher.

H1 hypothesis was rejected because the significance value of participating in innovation thought was 0.402> 0.05 in the analysis we made according to the gender of the employees in Table 5.8. The H2 hypothesis was rejected because the significance value of Innovation in Business was 0.159> 0.05. H3 hypothesis was rejected since the significance value of competitiveness

in the business was 0.645> 0.05. In other words, the participation of pharmaceutical company employees to the idea of innovation does not differ significantly in terms of innovation in business and competitive power in business. Pharmaceutical company employees gave similar answers regarding their participation in innovation thinking, innovation in business and competitiveness in business.

Table 5.9.

Comparison of Scores of Participation in Innovation Thinking, Innovation in Business and Competitiveness in Business According to the Age of Employees

Scales	Yaş	n	$\bar{x}$	s	Min	Max	F	p
Participating in Innovation Thinking	17-25	14	29,55	21,37	12	67	1,372	,255
	26-35	43	43,28	21,31	10	70		
	36-45	46	46,59	18,98	10	69		
	46-57+	4	37,60	19,53	12	58		
Innovation in Business	17-25	14	46,27	18,33	10	68	,799	,497
	26-35	43	51,42	10,05	26	70		
	36-45	46	50,89	9,26	10	67		
	46-57+	4	50,98	7,28	10	55		
Competitiveness in Business	17-25	14	28,48	8,98	27	36	1,204	,312
	26-35	43	31,65	6,71	18	48		
	36-45	46	31,98	4,73	17	45		
	46-57+	4	32,18	3,73	27	36		

As can be seen from the table above, it was determined that the average level of participation of 14 pharmaceutical company employees between the ages of 17-25 who participated in the study were (29.55 ± 21.37), the average of 43 pharmaceutical company employees aged 26-35 were (43.28 ± 21.31), the average of 46 pharmaceutical company employees aged 36-45 were (46.59 ± 18.98), and the average of 4 pharmaceutical company employees were 46-57 and over (37.60 ± 19.53). Pharmaceutical company employees aged 36-45 have a higher average of participating in innovation thinking.

It was determined that the average of 14 pharmaceutical company employees between the ages of 17-25 who participated in the study on innovation in the business were (46.27 ± 18.33), the average of 43 pharmaceutical company employees between the ages of 26 and 35 were

(51.42 ± 10.05),and between the ages of 36-45, the average of 46 pharmaceutical company employees were (50.89 ± 9.26), the average of 4 pharmaceutical company employees were 46-57 and over (50.98 ± 7.28) were determined. The average of opinions of pharmaceutical company employees between the ages of 26-35 on innovation in the business is higher.

The average of 14 pharmaceutical company employees who participated in the study were between the ages of 17-25 and the average of competitiveness in the business was (28.48 ± 8.98). The average of 43 pharmaceutical company employees were between the ages of 26 and 35 (31.65 ± 6.71), 36-45 years The average of 46 pharmaceutical company employees were between the ages of 46-57 and over (32.18 ± 3.73) The average of opinions of pharmaceutical company employees between the ages of 26-57 and over competitiveness is higher.

In Table 5.9, the H1b hypothesis was rejected because the significance value of participating in innovation thinking was 0.255> 0.05 in the analysis we made according to the ages of pharmaceutical company employees. The H2b hypothesis was rejected as the significance value of Innovation in Business was 0.497> 0.05. H3b hypothesis was rejected since the significance value of competitiveness in the business was 0.312> 0.05. In other words, the participation of pharmaceutical company employees to the idea of innovation does not differ significantly in terms of innovation in business and competitive power in business. Pharmaceutical company employees gave similar answers regarding their participation in innovation thinking, innovation in business and competitiveness in business.

Table 5.10.

Comparison of Scores of Participation in Innovation Thinking, Innovation in Business and Competitiveness in Business According to the Education Status of Employees

Scales	Education status	n	$\bar{x}$	s	Min	Max	F	p	Fark
Participating in Innovation Thinking	High School	11	36,84	16,38	10	60	4,304	,007*	2-4
	Vocational School	21	31,56	20,69	10	65			
	University	58	46,95	19,43	10	70			
	Postgraduate	17	49,86	19,30	12	70			
Innovation in Business	High School	11	49,57	8,32	33	60	,425	,736	
	Vocational School	21	48,57	15,00	10	70			
	University	58	50,80	10,87	20	68			
	Postgraduate	17	52,45	7,25	41	62			
Competitiveness in Business	High School	11	26,47	7,13	11	33	2,722	,048	1-4
	Vocational School	21	32,14	5,07	16	37			
	University	58	31,76	6,38	17	48			
	Postgraduate	17	32,42	5,51	17	41			

*$p < 0,005$

As it can be understood from the table above, the average level of participation of 11 high school graduate pharmaceutical company employees participating in the study was determined as (36.84 ± 16.38), the average of 21 pharmaceutical company employees who graduated from vocational school as (31.56 ± 20.69), university graduates 58 pharmaceuticals Company's average as (46.95 ± 19.43), and the average of 17 graduate graduate pharmaceutical company employees as (49.86 ± 19.30). Graduate pharmaceutical company employees have a higher average to agree with innovation thinking.

The average of 11 high school graduate pharmaceutical company employees who participated in the study on innovation in the business was determined as (49.57 ± 8.32). The average of 21 pharmaceutical company employees who graduated from vocational college was seen as (48.57 ± 15.00) and the average of 58 pharmaceutical company employees with university degrees were (50, 80 ± 10.87). The average of 17 graduate graduate pharmaceutical company employees was determined as (52.45 ± 7.25). The average of postgraduate graduate pharmaceutical company employees on innovation in the business is higher.

The average of 11 high school graduate pharmaceutical company employees who participated in the study was (26.47 ± 7.13). The average of 21

pharmaceutical company employees who graduated from vocational school was (32.14 ± 5.07). The average of 58 pharmaceutical company employees with university degrees was (31 , 76 ± 6.38) and the average of 17 graduate graduate pharmaceutical company employees was (32.42 ± 5.51). The average of opinions of graduate graduate pharmaceutical company employees on competitiveness in the business is higher.

The H1c hypothesis was accepted as the significance value of participating in innovation thought was 0.007 <0.05 in the analysis we made according to the education levels of pharmaceutical company employees in Table 5.10. The H2c hypothesis was rejected as the significance value of Innovation in Business was 0.736> 0.05. H3c hypothesis was accepted since the significance value of competitiveness in the business was 0.048 <0.05. In other words, the participation of pharmaceutical company employees to the idea of innovation and the competitiveness of the enterprise differ significantly in terms of education levels. Pharmaceutical company employees gave similar responses about innovation in the business according to their education level.

Table 5.11.

Participation in Innovation Thinking, Innovation in Business and Competitiveness in Business According to the Positions of Employees in the Business

Scales	Business location	n	$\bar{x}$	s	Min	Max	F	p
Participating in Innovation Thinking	Senior manager	9	53,52	15,46	33	69	2,267	,085
	Middle manager	34	44,68	19,99	12	69		
	Senior executive	13	50,54	13,34	12	65		
	Other employees	51	38,84	21,74	10	70		
Innovation in Business	Senior manager	9	49,60	16,76	10	64	,544	,653
	Middle manager	34	48,72	12,48	10	70		
	Senior executive	13	50,63	7,34	33	59		
	Other employees	51	51,81	9,68	26	67		
Competitiveness in Business	Senior manager	9	31,11	7,84	16	45	1,796	,153
	Middle manager	34	31,65	5,51	17	41		
	Senior executive	13	27,78	8,27	11	38		
	Other empleyees	51	32,20	5,68	18	48		

As can be seen from the table above, while the average level of participation of 9 sub-level managers of the pharmaceutical company participating in the study was (53.52 ± 15.46), the average of 34 mid-level managers of the pharmaceutical company contributing to the study was (44.68 ± 19.99). The average of 13 the senior pharmaceutical company managers was (50.54 ±

13.34) and the average of 51 other employees of the pharmaceutical company was (38.84 ± 21.74). The average of the lower level managers of the pharmaceutical company agreeing with the innovation thinking is higher.

While the average of the innovation opinion of the 9 sub-level managers of the pharmaceutical company participating in the study was (49.60 ± 16.76), the average of 34 mid-level managers of the pharmaceutical company contributing to the study was (48.72 ± 12.48). The average of 13 senior pharmaceutical company managers was (50.63 ± 7.34) and the average of 51 other employees of the pharmaceutical company was (51.81 ± 9.68). The average of other employees of the pharmaceutical company on innovation in the business is higher.

While the average of the competitiveness of the 9 sub-level managers of the pharmaceutical company participating in the study was (31.11 ± 7.84), the average of 34 mid-level managers of the pharmaceutical company that contributed to the study was (31.65 ± 5.51). The average of 13 senior pharmaceutical company managers was (27.78 ± 8.27) and the average of 51 other employees of the pharmaceutical company was (32.20 ± 5.68). The average opinion of the other employees of the pharmaceutical company about competitiveness in the business is higher.

The H1d hypothesis was rejected because the significance value of participating in innovation thought was 0.085> 0.05 in the analysis we made according to the positions of the pharmaceutical company employees in the business in Table 5.11. The H2d hypothesis was rejected as the significance value of Innovation in Business was 0.653> 0.05. H3d hypothesis was rejected because the significance value of competitiveness in the business was 0.153> 0.05. In other words, the participation of pharmaceutical company employees to the idea of innovation does not differ significantly in terms of innovation in business and competitive power in business. Pharmaceutical company employees gave similar answers about the participation of pharmaceutical company employees in the idea of innovation,

innovation in the business and competitiveness in the business according to their positions in the business.

Table 5.12.

Comparison of Points for Participation in Innovation Thinking, Innovation in Business and Competitiveness in Business According to Professional Experience of Employees

Scales	Professional Experience	n	$\bar{x}$	s	Mi	Ma	F	p	Far
Participating in Innovation Thinking	0-1 year	8	28.0	14.5	10	49	1,815	,132	
	2-4 years	1	48.0	16.2	12	69			
	5-10 years	2	44.8	20.0	10	65			
	11-15 years	3	41.0	21.1	12	70			
	16 years and more	1	48.2	22.0	10	70			
Innovation in Business	0-1 year	8	50.1	9.93	33	58	2,156	,079	
	2-4 years	1	43.7	12.0	20	59			
	5-10 years	2	52.7	13.1	10	70			
	11-15 years	3	50.3	9.99	10	67			
	16 years and more	1	53.2	6.46	40	62			
Competitiveness in Business	0-1 years	8	25.9	10.5	11	43	2,919	,025*	1-3
	2-4 years	1	29.2	6.30	18	37			
	5-10 years	2	31.5	5.34	20	38			
	11-15 years	3	32.9	5.28	21	48			
	16 years and more	1	32.4	5.74	17	45			

*$p<0,005$

As it can be understood from the table above, while the average participation level of the pharmaceutical company employees to the innovation idea between 0-1 years participating in the study was (28.08 ± 14.56), the average of the pharmaceutical company employees with 2-4 years of professional experience was (48.05 ± 16.26). The average of pharmaceutical company employees with 5-10 years of professional experience was (44.80 ± 20.05). The average of pharmaceutical company employees with 11-15 years of professional experience was (41.06 ± 21,19), and the average of pharmaceutical company employees with 16 years or more professional experiencewas determined as (48.23 ± 22.04). The pharmaceutical company's employees with a professional experience of 16 years or more have a higher average of participating in innovation thinking.

The average of 0-1 years of professional experience participating in the study was (50.17 ± 9.93) of the pharmaceutical company employees, while the average of the pharmaceutical company employees who contributed to the study with 2-4 years of professional experience was (43.77 ± 12, 05). The average of pharmaceutical company employees with 5-10 years of professional experience was (52.75 ± 13.15). The average of pharmaceutical

company employees with 11-15 years of professional experience was (50.38 ± 9.99) and the average of pharmaceutical company employees with 16 years or more of professional experience was (53.23 ± 6.46). The average of the innovation opinion of the employees of the pharmaceutical company with a professional experience of 16 years or more is higher.

It was determined that there was no statistically significant difference between the scores of the business employees included in the study from the Inclusion in Innovation Thought Scale and the Business Innovation scales according to their professional experience (p> 0.05).

While the average professional experience period of 0-1 years participating in the study was (25.93 ± 10.53) of the pharmaceutical company employees, the average of the pharmaceutical company employees who contributed to the study with 2-4 years of professional experience was (29.21 ± 6 , 30). The average of pharmaceutical company employees with 5-10 years of professional experience was determined as (31.50 ± 5.34). The average of pharmaceutical company employees with 11-15 years of professional experience was (32.98 ± 5.28). The average (32.43 ± 5.74) of pharmaceutical company employees with a professional experience of 16 years or more was determined. The average of employees of the pharmaceutical company with a professional experience of 11-15 years is higher in terms of competitiveness.

It was determined that there is a statistically significant difference between the scores of the company employees included in the study from the Competitiveness in the Business scale according to their professional experience period (p <0.05). Employees with a professional experience of 11-15 years have significantly higher Company Competitiveness scores than other professional experience periods.

As a result, there is a statistically significant difference between the scores of employees who have a professional experience of 16 years or more from participating in innovation thinking and their views on competitiveness in the enterprise. In addition, there is a statistically significant difference between

the scores of those with 11-15 years of professional experience from their opinions on competitiveness in the business. In Table 5.12, the H1e hypothesis was rejected because the significance value of participating in innovation thinking was 0.132> 0.05 in the analysis we made according to the professional experience of the pharmaceutical company employees. The H2e hypothesis was rejected because the significance value of Innovation in Business was 0.079> 0.05.

H3e hypothesis was accepted since the significance value of competitiveness in the business was 0.025 <0.05. In other words, it does not differ significantly in terms of the pharmaceutical company employees' participation in innovation thinking and their professional experience in business innovation. In addition, they gave different answers about competitiveness in the business.

5.4. Participation in Innovation Thinking, Innovation in Business and Competitiveness in Business Scales Correlation Analysis

In this section, the means, standard deviations and correlation analyzes of the research scales are shown.

Table 5.13.

Mean and Standard Deviation of the Scales

Scales	$\bar{x}$	ss
Participating in Innovation Thinking	43,35	20,27
Innovation in Business	50,50	11,04
Competitiveness in Business	31,40	6,24

The average and standard deviation of the scale for engaging in innovation thinking (43.35 ± 20.27), the average and standard deviation of the innovation scale in the enterprise (50.50 ± 11.04) and the average and standard deviation of the scale of competitiveness in the enterprise (31.40 ± 6, 24) have been identified. In this framework, it has been determined that there is more understanding of the innovation scale in the business. The analysis results on whether the variables subjected to the study in the study

are related to each other are given in the table 5.13. Here, the correlation analysis results regarding the relationship between the three variable independent variables the scale of participating in innovation thinking and the innovation scale in the enterprise and the competitiveness in the dependent variable enterprise are included.

Table 5.14.

Correlation Between Participation in Innovation Thinking, Innovation in Business and Competitiveness in Business

		Participating in Innovation Thinking	İnovation in Business	Competitiveness in Business
Participating in Innovation Thinking	r	1		
	p			
Innovation in Business	r	,222[*]	1	
	p	,021		
Competitiveness in Business	r	,036	,214[*]	1
	p	,715	,027	

*p<0,005

As can be seen from the table, there is a positive and significant relationship at the level of 0.05 between participating in innovation thinking, innovation in business and competitiveness in business. It has been found that there is a medium level (H1 hypothesis supported) and a medium level (H2 hypothesis supported) relationship between innovation in business and business competitiveness ($r = 0.214$) between participating in innovation thinking and innovation in business ($r = 0.222$).

5.5. Participation in Innovation Thinking, Innovation in Business and Competitiveness in Business Scales Regression Analysis

Thanks to these data, it is appropriate to test the main hypothesis. By performing correlation analyzes, data on the relationship between variables were obtained and the causality context of the relationship was examined. In the regression analysis performed below, the effect in the context of cause and effect between variables was determined.

Table 5.15.
Participation in Innovation Thinking, Innovation in Business and Competitiveness in Business Scales Regression Analysis

Model Summary				
Model	Correlation	Correlation Square	Corrected Correlation Square	Standard Error of Estimation
1	,214[a]	,046	,024	,61605

a. Predictors: (Constant), Innovation in Business
b. Dependent Variables: Participating in Innovation Thinking

ANOVA[a]						
Model		Sum of Squares	Degree of Freedom	Average of Squares	F	Sig.
1	Regresyon	1,896	2	,948	2,498	,007[b]
	Error	39,470	104	,380		
	Total	41,366	106			

a. Dependent Variables: Competitiveness in Business
b. Predictors: (Constant), Innovation in Business, Engaging in Innovation Thinking

Coefficients[a]						
		Non-Standardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2,538	,288		8,804	,000
	Participating in Innovation Thinking	,004	,030	,012	,127	,899
	Innovation in Business	,122	,056	,217	2,204	,030

a. Dependent Variables: Competitiveness in Business

The effect of product innovation, which is the basic hypothesis, on competitiveness has been tested. Findings regarding the analysis results of this test are included in the table 5.15. According to the results of the analysis, there is a 21.4% correlation between participation in innovation thinking, innovation in business and competitive power in business. In parallel, 4.6% explains the impact of innovation in business and participation in innovation thinking on the competitiveness of the enterprise.

Figure 5.17. Testing the Main Hypothesis of the Research on the Model

When the final results are examined, the participation of pharmaceutical company employees to innovation thinking and innovation in the company have a significant and positive effect on the competitiveness in the enterprise. (***H3 basic hypothesis is supported***). (Figure 4.18).

Sub-Hypotheses of Independent Variable of Participating in Innovation Thought

H1a hypothesis was rejected since the significance value of participating in innovation thinking according to the gender of pharmaceutical company employees was p> 0.05. A significant relationship at the level of .05 could not be found between the gender of pharmaceutical company employees and their tendency to participate in innovation thinking.

H1b hypothesis was rejected since the significance value of participating in innovation thinking according to the ages of pharmaceutical company employees was p> 0.05. A significant relationship at the level of .05 could not be found between the ages of pharmaceutical company employees and their tendency to participate in innovation thinking.

H1c hypothesis is accepted since the significance value of participating in innovation thinking is p <0.05 according to the educational status of pharmaceutical company employees. A significant relationship was found at the 05 level between the educational background of pharmaceutical company employees and their tendency to engage in innovation thinking.

H1d hypothesis was rejected because the significance value of participating in innovation thinking was p> 0.05 according to the positions of the pharmaceutical company employees in the business. A significant relationship at the level of .05 could not be found between the position of pharmaceutical company employees in the business and their tendency to participate in innovation thinking.

H1e hypothesis was rejected because the significance value of participating in innovation thought according to the professional experience of

pharmaceutical company employees was p> 0.05. A significant relationship at the level of .05 could not be found between the duration of professional experience of pharmaceutical company employees and their tendency to participate in innovation thinking.

Independent Variable Sub-Hypotheses of Innovation in Business

The H2a hypothesis was rejected because the significance value of innovation in the business according to the gender of pharmaceutical company employees was p> 0.05. A significant relationship at the level of .05 could not be found between the gender of pharmaceutical company employees and the innovation tendency in the company.

The H2b hypothesis was rejected because the innovation significance value of the company according to the ages of the pharmaceutical company employees was p> 0.05. A significant relationship at the level of .05 could not be found between the ages of pharmaceutical company employees and the innovation tendency in the business.

The H2c hypothesis was rejected since the significance value of innovation in the enterprise was p> 0.05 according to the education level of the pharmaceutical company employees. A significant relationship at the level of .05 could not be found between the education level of pharmaceutical company employees and the innovation tendency in the company.

The H2d hypothesis was rejected because the significance value of innovation in the enterprise was p> 0.05 according to the positions of the pharmaceutical company employees in the company. A significant relationship at the level of .05 could not be found between the positions of pharmaceutical company employees in the business and the innovation tendency in the business.

The H2e hypothesis was rejected because the significance value of innovation in the enterprise was p> 0.05 according to the professional experience of pharmaceutical company employees. A significant relationship at the level of .05 could not be found between the professional experience of pharmaceutical company employees and the innovation tendency in the enterprise.

Sub-Hypotheses for Competitiveness Dependent Variable in Business

H3a hypothesis was rejected because the significance value of competitiveness in the enterprise according to the gender of pharmaceutical company employees was p> 0.05. A significant relationship at the level of .05 could not be found between the gender of pharmaceutical company employees and the tendency of competitiveness in the company.

H3b hypothesis was rejected because the significance value of competitiveness in the enterprise according to the ages of pharmaceutical company employees was p> 0.05. A significant relationship at the level of 05 was not found between the ages of pharmaceutical company employees and the tendency to compete in the company.

H3c hypothesis is accepted since the significance value of competitiveness in the enterprise according to the education level of the pharmaceutical company employees is p <0.05. A significant relationship at the level of .05 was found between the education level of pharmaceutical company employees and the tendency to competitiveness in the enterprise.

H3d hypothesis was rejected because the significance value of competitiveness in the enterprise according to the positions of the pharmaceutical company employees in the business was p> 0.05. A significant relationship at the level of .05 could not be found between the positions of pharmaceutical company employees in the business and the tendency to competitiveness in the business.

H3e hypothesis is accepted since the significance value of competitiveness in the enterprise is p <0.05 according to the professional experience of the pharmaceutical company employees. A significant relationship at the level of .05 was found between the professional experience of pharmaceutical company employees and the tendency to compete in the enterprise.

CHAPTER 6

CONCLUSION AND DISCUSSION

Based on years of experience and knowledge in new virus strains such as SARS, MERS, Zika and Ebola, pharmaceutical companies conducting global researches will revisit their current drug and vaccine catalogs to identify potential treatments after sharing the genetic sequences of the SARS-CoV-2 virus new coronavirus strain. The very short duration of vaccines developed after the deciphering of the genome structure of the virus has shown the level of technology achieved in the pharmaceutical industry. Countries that have invested in the health sector and the pharmaceutical sector want to overcome this situation with as little losses as possible during this pandemic process. With these efforts, the use of vaccine types included in clinical trials has started worldwide. However, the high infectiousness of the new virus mutated in South Africa has started to question the strength of antibodies created by vaccines. The tests of today's new and currently available drugs have been concluded with over 80 clinical trials that are being conducted. A minimum of nine companies, members of the International Federation of Pharmaceutical Manufacturers and Associations, have developed new diagnostic tests or treatment modalities, testing patients infected by the current virus by strengthening existing drugs. Other companies have developed rapid diagnostic techniques to identify cases quickly. New diagnostic test types, vaccine types and treatment modalities have been developed for sick individuals. Processes are faster. State institutions and private enterprises have worked together. Public and private sector cooperation is experienced at a high level. Countries have agreed with private companies in many research programs for the development of therapies and vaccine types. The pharmaceutical industry continues to

cooperate with government agencies, universities and other healthcare stakeholders to meet the needs of infected or asymptomatic individuals.

6.1 Conclusion and Discussion

Here, a general summary of the study is made.

67.3% of the employees included in the study are male, 43.0% are between the ages of 37-46, 54.2% are university graduates, 47.7% are in other positions other than management. The professional experience of 33.6% has been found between 11-15 years. According to this result, it has been understood that there are more middle aged male employees with university graduates in the pharmaceutical companies that have been researched and these employees do not work as managers but are experienced in their profession. This shows that pharmaceutical companies have employees who are open to product innovation and can compete.

The survey study was found to be reliable as a result of the reliability analysis. It has been found that innovation perception is higher in most enterprises.

It has been determined that there is no statistically significant difference between the scores of the employees from the Innovation Thought Inclusion Scale and the Business Innovation Scale according to their gender, age, position in the business, and duration of professional experience, and the Business Innovation Scale according to their educational status (p> 0.05).

In a study conducted on entrepreneurs, it was found that women are more open to experience (Hachana et al., 2018). In a study conducted with managers and employees in the service and industry sector, it was found that innovativeness and job performance do not differ by gender (Yıldız et al., 2014).

In Nählinder's study, it was emphasized that the perspective towards innovation can be affected by gender (Nählinder, 2010). Venkatesh et al. In another study conducted by Ş., it was determined that gender affects the perceived ease of use of information technologies (Venkatesh, 2003).

Kunze et al. (2013) stated that the older workers in service, manufacturing, trade and finance businesses show less resistance to change than their younger colleagues, while the negative relationship between age and resistance to change is much more pronounced in those with short working hours. It has been found that there is almost no correlation between age and resistance to change among those working for a long time.

The International Labor Organization stated in 1980 that the 25-29 age group constituted the largest part of the working population in developed countries. However, it is stated that the majority of the working population in developed countries today consists of the 45-49 age group (Ng & Feldman, 2010).

Ng and Feldman (2008) stated that age is related to some dimensions of job performance, that older employees are more likely to engage in extra role behaviors, less likely to engage in behaviors that damage the purpose, and that they contribute more to organizational activity.

It has been reported that age may be related to the use of health information technologies. Similarly, educational status seems to have an effect on technology use and the perception of ease of use of technology (Brown et al. 2005).

It was determined that there is a statistically significant difference between the scores of the employees participating in the study, which they got from the Involvement in Innovation Thought Scale according to their educational status (p <0.05). The scores of Business Employees with a graduate degree were found to be significantly higher than business employees with a Vocational School education level.

According to these results, it was understood that the rate of participation of graduate employees in innovation thinking is higher, men and women, old and young, managers or employees, experienced or inexperienced people think similarly about participating in innovation thinking and innovation in business. Accordingly, it is thought that employees should be encouraged to increase their education level in order to increase their participation rates.

Education status is directly related to the perception of innovation, and people need to work to create environments where they can improve themselves (Yıldız, 2017).

45.8% of the enterprises participating in the study are 11-16 years old and over, 52.3% have an annual turnover of 40,000,000 TL, 64.5% are 51-250 employees, 52.3% pharmaceutical company, 35.5% has ISO Certificates, Trademark Registration Certificate, CE Certificate, TSE Certificate, 54.2% does not export, 47.7% is a joint stock company, 37.4% has been found to be in the national market structure. According to this result, it is understood that the research consists of joint stock companies with normal annual turnovers, experienced in the sector, high number of employees, all legal documents, non-exporting national customers. In this context, it has been concluded that the enterprises in our research compete in the national market by realizing product innovation.

There is a statistically significant difference between the companies in the research, their age, annual turnover, number of employees, their field of activity, whether they export or not and their legal structure, the status of participating in the innovation idea and the innovation in the enterprise, and the scores they get from participating in the innovation idea according to the documents and basic market structures of the enterprises. It was determined that there was no (p> 0.05). In addition, it was determined that there is a statistically significant difference between the innovation scores of the enterprises according to the documents they have and their basic market structures (p <0.05). The innovations of the enterprises with international market structure with CE certificates have been found high.

However, their views are similar to whether the pharmaceutical companies are old and new companies, the amount of their annual turnover, their workforce, whether they are a Pharmacy, Pharmaceutical company, Health enterprise and Medical equipment sales enterprise, whether they are exporting or not, and whether they participate in innovation thinking and innovation in business.

Similar to the findings of this study, in a previous survey study on innovation, the total working time of the participants was reported as 34.4% for 1-5 years, and 74.2% for under 40 years of age (Ekiyor & Arslantaş, 2014).

Within the scope of the pandemic process experienced within the scope of Porter's theory, the effect of the product innovation role of the pharmaceutical companies operating in the pharmaceutical industry on the competitiveness was evaluated. Accordingly, the pandemic process, which is caused by the macro environment that affects the profitability of pharmaceutical companies today, is a means of evaluating external forces. In the pharmaceutical sector, the attractiveness of the market and the income to be obtained from the general sector should be defined by the pharmaceutical companies. In the current competition in the pharmaceutical industry, different market conditions such as reduction from sales price due to the pandemic, introduction of different products that were not available in the market, campaigns related to advertisements and improvements in services were followed. This situation is attributed to the intensity on which pharmaceutical companies compete and the fundamentals on which they compete. Companies entering the pharmaceutical industry during the pandemic brought new capacity, the desire to gain market share and often significant resources. In this process, it is thought that economies of scale, product differentiation, capital requirements, cost disadvantages, access to distribution channels and stretching the state policy will be beneficial in entering the pharmaceutical market. Reducing the level of high bargaining power of suppliers will help humanity.

In response to the competition faced by each of the companies that demonstrate functionality in the global and local field, pharmaceutical companies have to continue their struggles in a very determined manner. It is the primary goal of the pharmaceutical companies to succeed and continue their lives during this struggle. For pharmaceutical companies to achieve these goals, it will certainly be related to the advantages they will provide against rival pharmaceutical companies. The advantage of pharmaceutical companies against the pharmaceutical companies they compete with will

progress thanks to the ability of the pharmaceutical company to transform its own assets into capabilities. In order for pharmaceutical companies to gain competitive advantage, it will be possible by first evaluating their own assets and answering the question of how to become better by using these assets. Innovation is the biggest guide of companies in the research stages of the methods of getting better from the current situation. Innovation plays a very important role in helping pharmaceutical companies gain competitive advantage over other pharmaceutical companies with which they compete. Pharmaceutical companies, which make innovation internal, will make their competitive advantage permanent against other pharmaceutical companies in the competitive track. Pharmaceutical companies' identification of innovation is related to the creativity of their abilities that are capable of valuing. In order for the capabilities to perform innovative functions, it is imperative that pharmaceutical companies value their values and make investments that will support the development of their capabilities. Innovation is a dynamic collection of stages, and the innovation process forces pharmaceutical companies to perform all their functions in coordination with each other. During the innovation process, the company management must direct all company functions to the same goal in order for the pharmaceutical companies to operate in harmony. The point where innovation stages have the most impact is on the income of the pharmaceutical company. Pharmaceutical companies should either increase their market share or make restrictions on major expenditure items in order to increase their revenues. With the innovation process, pharmaceutical companies will use their resources better to reduce their expenses and increase their revenues by increasing their sales with this competitive advantage.

In this study, the stages of innovation are explained and why it is necessary to apply these stages by pharmaceutical companies is tried to be revealed. Since pharmaceutical companies do not have the same values and capabilities, each of the pharmaceutical companies gaining market advantage as a result of the innovation process can show itself in different ways. While major pharmaceutical companies gain an advantage in market

competition with cost leadership as a result of the innovation process, some pharmaceutical companies can gain market advantage with their differentiation strategy thanks to their innovative differentiation in pharmaceutical and drug production technology.

Participating in the innovation idea of businesses that are newly established or have been working for a long time, have low or high annual turnover, have more or less employees, have or do not have different fields of activity in the pharmaceutical sector, export or do not, have different legal structures or not, and It has been understood that they think similarly about innovation in business. Accordingly, it is thought that enterprises should be encouraged to obtain CE certificate and to switch to the international market structure in order to increase the participation rates.

There is a statistically significant and positive relationship between participation in innovation thinking and innovation in the enterprise, between the age of the enterprise and innovation in the enterprise, between the age of the enterprise and the annual turnover of the enterprise, between the number of employees in the enterprise and the participation in the innovation thinking, between the number of employees in the enterprise and the age of the enterprise, between the number of employees in the enterprise and the annual turnover of the enterprise, between exports business status and the sector in which the business operates, between the business legal structure and the age of the business, between the business legal structure and the annual turnover of the business, between the business legal structure and the number of employees in the business, between the basic market structure of the business and the scale of innovation in the business, between the business legal structure and the age of the business between the business legal structure and the annual turnover of the business, between the basic market structure of the business and the number of employees in the business, between the business basic market structure and the business legal structure.

Therefore, a positive change in innovation thinking increases innovation in the enterprise. Thus, as the age of the enterprise increases, innovation and annual turnover in the enterprise increases. Accordingly, as the number of employees in the enterprise increases, the number of people participating in innovation thinking increases with the age of the enterprise and the annual turnover of the enterprise. According to this, as the scores on whether the enterprise exports or not, the scores obtained from the sector in which the enterprise operates increase. Hence, as the points obtained regarding the legal structure of the enterprise increase, the points they receive from the age of the enterprise, annual turnover and the number of employees in the enterprise also increase. Thus, as the points obtained in relation to the basic market structure of the enterprise increase, the points they get from innovation in the enterprise, the age of the enterprise, the number of employees in the enterprise and the legal structure of the enterprise also increase.

A statistically significant and negative relationship was determined between the sector in which the enterprise operates and the annual turnover of the enterprise, between the sector in which the enterprise operates and the number of employees in the enterprise, between the state of exporting and the age of the enterprise, between the state of exporting and the annual turnover of the enterprise, between the export status and the number of employees in the enterprise, between the legal structure of the enterprise and the state of exporting and between the basic market structure of the enterprise and the state of exporting. Therefore, as long as the business changes the sector, there is a decrease in the annual turnover and the number of employees. Accordingly, experiencing negativities in business exports causes a decrease in the life span of the enterprise, in the annual turnover and the number of employees in the enterprise. Thus, as the points obtained regarding the legal structure of the enterprise increase, the points they receive for exporting are also decreasing. According to this, as the points obtained regarding the basic market structure of the enterprise increase, the points they get for exporting are also decreasing. Competitor

relations are considered to be independent of other factors other than occupational groups (Wolper, 2004).

Although the pharmaceutical companies that have CE certificates and have an international market structure are of the same opinion, they have different views on participating in the idea of innovation.

A positive change in the idea of innovation in businesses ensures innovation in the enterprise.

Increasing the age of the enterprise will increase the innovation and annual turnover in the enterprise, the increase in the number of employees, the number of participating in the idea of innovation, the life span and annual turnover of the enterprise, the position of the enterprise in the sector in which the enterprise operates, the increase in the legal structure of the enterprise, the age of the enterprise, the annual turnover and the enterprise. The increase in the number of employees, the points obtained in relation to the basic market structure of the enterprise increases the points they get on innovation in the enterprise, the age of the enterprise, the number of employees in the enterprise and the legal structure of the enterprise.

In case of changing the sector of the enterprises in which the employees are located, there are problems in their annual turnover and number of employees, business exports, the lifetime of the enterprise, the annual turnover and the number of employees in the enterprise, the increase in the points obtained regarding the business legal structure and the increase in the points obtained in relation to the basic market structure of the enterprise. It is observed that the scores they got from doing not do it.

The scale of participating in innovation thinking and the scale of innovation in business affect the competitiveness scores of 4.6%. It was seen that the scores obtained from the innovation scale in business predicted the competitiveness scores positively. The fact that the company gets 1 point more than the innovation scale increases its competitive power by 0.12.

A statistically significant and positive relationship has been determined between the basic market structure of the business and innovation in the business.

Considering the relation between Demir and Geyik (2014) pharmaceutical R&D investments and innovation in the literature, it is stated that there is a direct relationship between these two phenomena.

A statistically significant and positive relationship has been determined between the annual turnover of the company and the innovation in the company. A positive relationship has been determined between the budget allocated for the activities of the R&D department in the organizations and the innovation ability of the organization. It is seen that this finding supports the results of the study previously conducted by Nart, Güner and Nart (2017) on the subject in the literature. This literature finding overlaps with our research findings.

A statistically significant and positive relationship has been determined between business legal structure and innovation in business. In the literature, Yavuz (2010) found a positive relationship between the perception of organizational culture that supports innovation and innovation ability. Abdul and Pharaon (2010), on the other hand, determined that as the perception of organizational culture that supports innovation increases, the perception of innovation ability increases and that creative ideas can be formed within the organization. Similarities to these results of the study have been revealed in different studies in the literature. Kelley (2010) determined that organizational culture does not only affect innovation capability, but also which innovation ability will apply. Tellis, Prabhu, and Chandy (2009) found a positive relationship between perception of organizational culture and innovation ability. Özkan and Turunç (2015) found that organizational culture is effective on innovation ability. Okibo and Shikanda (2011) found that organizational culture affects the innovation ability, and that innovation capability increases with the inclusion of organization employees in managerial activities by allowing them to achieve organizational goals. In the literature, Dobni (2008)

stated that increasing the values of the organizational culture such as creativity, risk taking, freedom, teamwork among employees will increase the innovation capability of the organization.

Accordingly, a statistically significant and positive relationship has been determined between the basic market structure of the enterprise and innovation in the enterprise. By introducing creatively designed new products, firms can reach a more competitive position than their competitors. On the contrary, rival companies may also be inclined to follow through by imitating their competitors' product innovations. (Chao et al., 2014; Chuang et al., 2015; Song, 2015). It is natural to think that the development of a firm's absorptive capacity compared to its competitors is effective in this trend. Firms can take reactive approaches such as offering better products than their competitors (Frambacha et al., 2003) as well as collaborating in developing new products. This literature information is consistent with the findings of the study.

In the literature on innovation, it is stated that a management that enables open-mindedness, experience and cooperation is required (Kelley et al., 2011; Russell, 1999). Scott and Bruce (1994) stated that an environment that supports innovation is positively associated with innovative behaviors. In this context, it is revealed that managers have a great role in shaping the business environment. The individual innovative behaviors of managers involved in the strategic decisions of the business are important both for their own success and for their influence on the behaviors of the employees under them. Likewise, it is important for managers to act as decisively as they show in achieving the goal, to maintain their motivation in the face of problems that may arise, to set an example for themselves and to those working under them, to guide them and to design the working environment. It is known that business success is closely related to the performance of employees.

Hurt et al. (1977) stated innovativeness as innovator 1.5%, pioneer 13.5%, questioning 34.9%, skeptical 34.9% and traditionalist 15.6%. In the study in which the Turkish validity and reliability of the scale were performed, the

percentages from innovative to traditionalist were found as 2.9, 13.4, 32.1, 39.7, 12.0 (Kılıçer & Odabaşı, 2010), respectively. In a study conducted with academicians, it was stated that, similar to this study, academicians were generally in the questioning category. In addition, it was stated that the innovation scores of professors were higher than the scores of assistant professors, and according to this result, it was suggested that experience made people more innovative (Demircioğlu et al., 2016).

The size of the enterprises can be evaluated according to factors such as the number of employees, physical capacity (for example, the number of beds in hospitals), the amount of input or output, and financial resources (Camisón-Zornoza et al., 2004).

In the literature, it is stated that large enterprises can adopt innovations more easily because they can benefit from economies of scale and reduce their costs, and they can benefit more from innovations than small enterprises. However, it is also stated that the excess of hierarchical layers in large enterprises increases the reaction times, while in small enterprises, decisions can be made faster due to the faster communication, so that innovations can be accepted faster (Fama & Jensen, 1983; Nystrom et al., 2002). It is stated that the fact that large enterprises have a more bureaucratic and rigid structure causes them to be less innovative than small enterprises (Whetten, 1987; Jaskyte, 2013). In addition, it is stated that the management structures of small enterprises are more flexible, while large enterprises can access information and human capital more easily (Rogers, 2004).

In the literature, there are also studies that find a negative or positive relationship or indicate that there is no relationship between innovativeness and firm size (Camisón-Zornoza et al., 2004; Damanpour, 1992). In a study examining the effect of firm size according to innovation types, although firm size was found to be effective in the adoption of radical innovations, no effect on incremental innovations was detected (Germain, 1996). In a study conducted by Gopalakrishnan and Damanpour (2000) with commercial banks, it has been determined that there is a relationship between the

adoption of innovations and firm size. Nystrom et al. (2002) found a positive relationship between hospital size and innovativeness as a result of their study. As a result of the data obtained from 266 scientists working in 64 projects in the fields of alternative energy, biology, chemistry, geophysics, materials sciences and interdisciplinary studies in six publicly funded research institutions, the larger organization's technical information exchange, the time spent on research and professional activities, It has been determined that it has a negative effect on the research processes (research decisions, excitement to do research, creative thinking time, freedom to research new ideas, and the ability to take great risks) (Mote et al., 2016).

In a study conducted with 121 companies operating in the field of biotechnology, the relationship between business size and innovation was not found to be significant, but it was found that there was a positive relationship between innovation and export intensity, and it was stated that innovation is important in accessing global markets and export success (Pla-Barber & Alegre, 2007) .

Innovation does not only come from R&D investments and inventions. Daily innovations in the workplace are essential for the survival and well-being of the organization (Janssen, 2000; Oldham, 1996). Therefore, human resources experts, managers and social scientists aim to encourage a large part of the employees in the organization to innovative behavior (Spiegelaere et al., 2012). He stated that innovative behavior is a strategic activity that gives companies a competitive advantage and loses them. Innovative behavior has been defined as a multi-step process by Scott and Bruce (1994).

It has been reported that businesses that want to survive in a global competitive environment need to innovate and allocate sufficient resources to R&D (Örücü et al., 2011)

On the other hand, Aktan and Toraman (2003) state that innovation approaches are the leading factors that will be effective in the survival of

businesses and attaining competitive advantage by differentiating from their competitors.

In our study, the Cronbach's Alpha value of the Innovation Thought Inclusion Scale was determined as 0.975, and the Cronbach's Alpha value of the Innovation in Business Scale was determined as 0.950.

In the study conducted by Shih and Susanto (2011) in Indonesia, the Innovative Business Behavior Scale developed by Janssen (2000) was used. The scale was scored from one to seven (1 = strongly disagree, 7 = strongly agree). The innovative business behavior score of 135 people working in the production and marketing unit of pharmaceutical companies in Indonesia was determined as 4.38 ± 0.95. It is seen that the scores obtained in the study of Shih and Susanto (2011) are lower than this study.

The reliability of the questionnaire items used was evaluated for the first time by the internal consistency Cronbach Alpha coefficient method developed by Lee Cronbach in 1951. This method tests whether the items in the scale can form a whole in order to question the homogeneous structure (Ekiyor & Arslantaş, 2014; Cronbach, 1970).

The reliability coefficient in R&D and innovation studies was determined as 0.82 in the study of Kılıçer and Odabaşı (2010).

6.2 Recommendations

6.2.1. Recommendations for Practitioners

In the light of all these mentioned, suggestions were made to the practitioners to carry out future researches.

- It is recommended to provide support from business managers for the acceptance and realization of innovation thinking in businesses. As it is known, achieving success in the stages of innovation and thus securing the future is largely provided by the support of managers. In addition, employees' acceptance of innovation will provide a competitive advantage to businesses. It would be beneficial for businesses to have a management philosophy that aims to accept and

apply the idea of innovation to the economic crisis that is seen on a global scale and has many aspects.

− It is suggested to include more innovation in businesses. The acceptance of the innovation idea in businesses, its inclusion and implementation, and the determination of innovation policies are related to the decisions to be made by the management level. Similarly, the business structure should be organized in a way to show the innovative aspects of the employees, and the necessary structures, procedures and research parts should be carried out by the senior management.

− According to the result of this study, it is recommended to plan in-service training of business managers and employees on innovation and to include the subject of competition in the training content in order to develop the business in terms of competitiveness. In the acceptance and implementation of the innovation idea of the manpower that constitutes the intellectual capital of the enterprises, the decisions to provide training to the employees to be given by the management, the implementation of these training decisions and the measurement and reporting of the training implementation results are important in terms of competitiveness.

− It is recommended to carry out studies using different research methods in a different sample in different sectors on innovation thinking and realization in businesses, competitiveness. The competitive conditions of today's global business life and differentiating economic conditions necessitate large-scale innovation research in order for businesses to achieve their continuity and income targets. Within the framework of the research results, business managers are required to demonstrate an innovative management approach in order to increase their competitiveness through innovation. However, although the perception of additional cost, which is one of the negative perceptions towards innovation in research, is an important factor in innovation, positive perceptions towards

innovation should not be prevented. If the perception of additional cost in research prevents positive perceptions, it will cause negative situations on the innovation management process and its results, as well as reduce the real impact of innovation types on competitiveness. It should be noted that academic research activities on innovation will differentiate businesses from other competitors. Although academic innovation studies conducted in the direction of demands and expectations have some additional costs at various stages in the process, their long-term contributions will be more valuable.

6.2.2. Suggestions for Researchers

In the light of all these mentioned, various suggestions were made to researchers to carry out future research.

- In the literature, it is seen that the number of studies on the effect of product innovation role of pharmaceutical companies operating in the pharmaceutical industry on their competitiveness is very limited. For this reason, it is predicted that researchers' in-depth studies on the effect of product innovation role of pharmaceutical companies operating in the pharmaceutical industry on competitiveness will increase awareness.

- Considering the relationship with positive organizational behaviors, health care enterprise managers and employees should participate in innovation thinking, innovation in the enterprise and competitiveness development programs in the enterprise should be introduced in order to have a more efficient structure.

- Quantitative studies can be conducted to reveal more clearly the relationship between each of the factors emerging in the qualitative dimension of the research with participation in innovation thought, innovation in business and competitiveness in business.

- In addition to the contribution of participating in innovation thinking, innovation in the enterprise and competitive power in the enterprise in the context of the organization, the contributions it will provide to individuals individually can be investigated.

- Research can be conducted to reveal the effect of participating in innovation thinking, innovation in the enterprise and competitive power in the enterprise on problem solving skills.
- It is important to conduct theoretical researches in order to expand the knowledge of innovation in business, innovation in business and competitiveness in business, considering the Turkish pharmaceutical industry.

For all these reasons, it is thought that the academic research, which is about determining the effect of product innovation role of pharmaceutical companies operating in the pharmaceutical industry on the competitiveness of the pharmaceutical companies, is based on the findings of previous scientific studies, the ideas expressed and the approaches discussed in terms of contribution to the literature that makes this research important. In academic studies conducted as a continuation of each other, previous studies on the research subject were reviewed and it was seen that the study was studied for the first time in the Turkish literature. Within the scope of the process called literature review in academic research, studies such as searching, finding, analyzing, reading, classifying, summarizing and synthesizing previously published works related to the research subject were carried out. In the literature review and analysis, the point the previous literature has reached on the subject under investigation was determined, the gaps and omissions in the literature were revealed, and it was determined where our own study would fit in the previous literature. Considering that the literature review is an indispensable requirement for academic research, a total of 129 literature has been reached. In the academic study, the purpose, research questions, problem situation, hypotheses, methods, findings and results are presented with the support of the information obtained as a result of the literature review. It has gained a scientific depth and identity with the literature review done as required by academic research. The contribution of academic research to humanity and science has also been shown by the importance it attaches to literature review. It is thought that the research carried out by taking into account the previous studies on the subject will

eliminate the important deficiencies in subjects such as originality, competence, responding to the needs of the target audience and contribution to science. In the scientific study carried out with the literature review, almost all of the technology, equipment, systems, ideas and trends that are a part of daily life have been adequately evaluated. Literature research was carried out in different formats and details in book and article studies, undergraduate, graduate and doctoral theses, project and thesis proposals, and even assignments. Literature reviews were made as separate sections in thesis proposals and theses, and mainly in introduction sections for articles. It was not easy to search the literature, read and synthesize the sources found, especially in the thesis stage, and the process was followed meticulously and systematically.

In this study, different from Turkish and foreign literature, the issues of participating in innovation thought, innovation in business and competitiveness in business are examined on the basis of Bursa, which has a cosmopolitan structure. The thought that the study was conducted with 107 pharmaceutical company employees in Bursa province would be a very important support to the pharmaceutical sector literature of the province, as well as contribute to the national pharmaceutical industry.

In the first stage of the application of research results, taking into account the pandemic process, drug sector business managers and employees should be programmed to participate in innovation thinking, innovation in business and competitiveness in business.

In conclusion, as a result of the innovation process, productivity increases are realized in pharmaceutical companies, new processes and technologies are introduced, production costs of drugs are reduced, a cost advantage against competitors is achieved and competitive advantage is achieved. Both the superiority achieved by pharmaceutical companies in pharmaceutical production costs and the changes they have created in the pharmaceutical and pharmaceutical production processes have provided an important competitive power.

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ANNEXES

Appendix 1- Survey Forms

SURVEY FORM

Dear participants;

This questionnaire form is a study prepared in order to be used in the doctoral thesis titled "The Role of Product Innovation in Pharmaceutical Industry, Its Effect on Competitiveness" of the Institute of Social Sciences of Near East University. With this study, it is aimed to measure the effect of product innovation on the role of product innovation in pharmaceutical companies operating in Bursa.

Since the result of the survey as a whole is important, no information is required to introduce the name and identity information of the donor or the person.

For the validity of the research, we request that your answers be objective, and we would like to express our gratitude and respect for your interest and contribution.

Gülsüm Belgin ÜNAL

QUESTIONS

SECTION 1

DEMOGRAPHIC INFORMATION

Question 1: Your gender?
( ) Female   ( ) Male
Question 2: Your year of birth?.. (Please Specify)
Question 3: Your educational status?
( ) Primary school / primary education   ( ) High school   ( ) Vocational School
( ) University   ( ) Postgraduate
Question 4: İşletmedeki konumunuz?
( ) Senior manager   ( ) Middle manager   ( ) Senior executive
( ) Other...**(Please Specify)**
Question 5: Your professional experience period?
( ) 0-1 year   ( )2-4 years   ( )5-10 years   ( )11-15 years   ( )16 years and more
Question 6: İşletmeniz kaç yaşındadır?
( ) 0-1 year   ( )2-4 years   ( )5-10 years   ( )11-15 years   ( )16 years and more
Question 7: How much is the annual turnover of your business?
( ) 0-999.999 TL ( )1.000.000-7.999.999 TL   ( ) 8.000.000-40.000.000 TL
( ) 40.000.000 TL üzeri

INFORMATION ABOUT THE BUSINESS
Question 8: How many employees does your business have?
( ) 1   ( )2-5   ( ) 6-10 ( )11-50 ( )51-250
Question 9: What sector does your business operate in? …………… ....
Question 10: Which of the following documents does your business have?
() ISO Certificates ( ) Trademark Registration Certificate ( ) CE Certificate ( ) TSI Certificate
( )Other..................................(Please Specify).
Question 11: Does your business export?
( ) Yes   ( )No
Question 12: What is the legal structure of your business?
() Sole Proprietorship () Limited Company () Collective Company () Joint Stock Company
() Other .... (Please specify).
Question 13: What is the basic market structure of your business?

() Local () Regional () National () International

SECTION 2

PARTICIPATING IN INNOVATION THOUGHT

Below are some sentences. Indicate the degree to which you agree with them by choosing one out of 1 to 7 points. 1- I do not agree at all, 2- I do not agree, 3- Somewhat / partially disagree, 4- I am indecisive, 5- A little / partially agree, 6- I agree, 7- Totally Agree	I do not agree at all	I do not agree	Somewhat/partially disagree	I am indecisive	A little/partially agree	I agree	Totally agree
14. Our company has sufficient technological infrastructure where they can easily access information about the company and the sector.							
15. Training and development activities are carried out for the employees of our company.							
16. Our business has an innovative culture (such as being open to innovation).							
17. In our business, there has been a change or increase in the range of products and services since the last 5 years.							
18. In our business, attention is paid to the fact that people are innovative and creative in recruiting personnel.							
19. Our business makes changes (to increase sales) in product packaging, design and price.							
20. Our business has introduced new products / products and services / services to the market in the last 5 years.							
21. Our business has clear goals / targets for innovation.							
22. Since the last 5 years in our business, we have been in production, supply and distribution etc. new methods are used in processes.							
23. In our business, innovations have been made in production tools (purchase of new machinery, etc.) in the last 5 years.							
24. High-tech tools and equipment are used for the products produced in our facility.							
25. We have an employee in charge of R&D or innovation management in our business.							
26. The technological knowledge and capabilities of our company are sufficient to solve the problems that arise.							
27. Great efforts are made in our business to develop new products.							
28. Not only the research and development department, but all departments are jointly responsible for innovations in our business.							
29. When a new proposal comes up, managers do not give an effort and discouraging answer such as "we have tried this before", "this will not happen" and "this is ridiculous".							
30. Managers expect the employed people to also produce new ideas, solutions and inventions in their work.							

SECTION 3

INNOVATION IN BUSINESS

Below are some sentences. Indicate the degree to which you agree with them by choosing one out of 1 to 7 points. 1- I do not agree at all, 2- I do not agree, 3- Somewhat / partially disagree, 4- I am indecisive, 5- A little / partially agree, 6- I agree, 7- Totally Agree	I do not agree at all	I do not agree	Somewhat/partially disagree	I am indecisive	A little/partially agree	I agree	Totally agree
31. Our business embraces original and innovative issues developing in the market.							
32. Innovative production can only be made by the best companies.							
33. Innovation can be done in the specialty of the enterprises.							
34. Understanding or applying innovation is complex.							
35. Innovation is necessary to improve product quality.							
36. Innovation is necessary to increase product range.							
37. Innovation is necessary to reduce costs.							
38. Innovation is necessary to create new markets.							
39. Innovating involves economic risk.							
40. It is costly to innovate.							
41. There is no necessary funding source to innovate.							
42. There is no qualified personnel required to innovate.							
43. Changes, new ideas and inventions are not dealt with because of difficulties in its implementation.							
44. Our company responds quickly to the moves of competitors that threaten our company.							
45. We constantly collect information on competitors' strategies and activities.							
46. Senior management periodically discusses competitors' strengths and strategies.							
47. While determining our strategy, we focus on producing products that will create added value for our customers.							
48. The main goal of the business is customer satisfaction.							
49. The main goal of our competitive strategy is to understand customer needs.							
50. While determining our strategy, we focus on how we can produce more valuable / beneficial products for our customers.							
51. We continuously and systematically measure how satisfied our customers are with us.							
52. We pay great attention to the quality of after-sales services.							
53. The functions and activities of all our units are coordinated with each other in order to serve the needs of the market.							
54. All units of our business are sensitive to each other's demands and needs.							
55. All units of our business transmit all their information about the market to each other.							
56. All our units and managers know very well what should be done for customer satisfaction.							
57. There is strong coordination among the units that gives us a competitive advantage.							
58. Our company considers producing and introducing new products to the market as its basic strategy.							

Appendix 2- Participant Information Form

KATILIMCI BİLGİLENDİRME FORMU

This study was conducted by Asst. Assoc. Dr. Ayşe Gözde Koyuncu and created by Gülsüm Belgin Ünal. In the study to be carried out, it is aimed to evaluate the opinions of pharmaceutical company employees about the role of product innovation in the pharmaceutical industry and its impact on competitiveness. For this, it is planned to conduct a survey with the employees of pharmaceutical companies operating in Bursa province.

Personal information is not included in the questionnaire form created. The results obtained will be kept carefully and safely by the researchers themselves, will not be shared with other people and will not be used for any purpose other than the purpose of the research. However, participation in research is not mandatory.

No content was included in the forms that would make the participants feel uncomfortable or insecure. In order to achieve this, participants are expected to fill in the form using sufficient time to allow them to fill out the form.

After the necessary data has been collected, you can contact the researchers (Assist. Prof. Dr. Ayşe Gözde KOYUNCU, Near East University Faculty of Economics and Administrative Sciences, Phment of Business Administration, aysegozde.koyuncu@neu.edu.tr, Gülsüm Belgin ÜNAL, gbelginunal @ gmail. com), there is no harm in contacting you. Thank you for your contribution to the study and for your valuable time.

I agree to participate in this study.

First Name:

Last name:

History:

Signature:

CURRICULUM VITAE

PERSONAL INFORMATION

Name Surname : Gülsüm Belgin Ünal

Nationality : TC

Birth of Place / Date: Antalya/1983

E-mail address : gbelginunal@gmail.com

EDUCATIONAL STATUS

DOCTORATE : 2015-2020

Southern University IMBL, Business Administration / Russia

MASTER'S DEGREE: 2010-2013

Ahmet Yesevi University, Health Care Management / Kazakhstan

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UNIVERSITY: 2001-2004

Ege University, Travel Management / İzmir

HIGH SCHOOL: 1998-2001

Manavgat Anadolu Vocational High School / Antalya

FOREIGN LANGUAGE: English

PLAGIARISM REPORT

DOKTORA TEZ

%**15**	%15	%3	%
BENZERLIK ENDEKSI	İNTERNET KAYNAKLARI	YAYINLAR	ÖĞRENCI ÖDEVLERI

BIRINCIL KAYNAKLAR

1	www.ieis.org.tr İnternet Kaynağı	%3
2	docs.neu.edu.tr İnternet Kaynağı	%2
3	www.hurriyet.com.tr İnternet Kaynağı	%2
4	acikerisim.deu.edu.tr İnternet Kaynağı	%1
5	avys.omu.edu.tr İnternet Kaynağı	%1
6	ieis.org.tr İnternet Kaynağı	%1
7	iibf.deu.edu.tr İnternet Kaynağı	%1
8	dergipark.org.tr İnternet Kaynağı	%1
9	www.openaccess.hacettepe.edu.tr:8080 İnternet Kaynağı	<%1

ETHİCS COMMİTTEE APPROVAL

YAKIN DOĞU ÜNİVERSİTESİ

BİLİMSEL ARAŞTIRMALAR ETİK KURULU

14.09.2017

Sayın Yrd. Doç. Dr. Ayşe Gözde Koyuncu,

Bilimsel Araştırmalar Etik Kurulu'na yapmış olduğunuz YDÜ/SB/2017/58 proje numaralı ve **"İlaç Endüstrisinde Ürün İnovasyonunun Rolü, Rekabet Gücü Üzerine Etkisi"** başlıklı proje önerisi kurulumuzca değerlendirilmiş olup, etik olarak uygun bulunmuştur. Bu yazı ile birlikte, başvuru formunuzda belirttiğiniz bilgilerin dışına çıkmamak suretiyle araştırmaya başlayabilirsiniz.

Yardımcı Doçent Doktor Direnç Kanol

Bilimsel Araştırmalar Etik Kurulu Raportörü

Not: Eğer bir kuruma resmi bir kabul yazısı sunmak istiyorsanız, Yakın Doğu Üniversitesi Bilimsel Araştırmalar Etik Kurulu'na bu yazı ile başvurup, kurulun başkanının imzasını taşıyan resmi bir yazı temin edebilirsiniz.