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Head of the Doctoral (PhD) School:
Prof. Dr. Imre Fertő DSc

Name of the supervisors:
Prof. Dr. Sándor Kerekes DSc
Ass. Prof. Arnold Csonka PhD

**THE RECENT TRENDS IN THE PHARMACEUTICAL INDUSTRY,
WITH SPECIAL ATTENTION FOR THE REPUBLIC OF
KAZAKHSTAN!**

Written by
DINARA ALIYEVA

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Preface

The theme selection of the dissertation was motivated by my earlier work experiences. During my ministry work, I had a good impression about the situation of the Kazakh pharmaceutical industry. I met with a lot of experts and with a lot of data, so I could reasonably believe that an appropriate database could be built for a reliable statistical analysis. During my PhD training one quantitative methodology course made it clear to me, that the available and accessible Kazakh pharmaceutical industry's data, relating to my topic, is unsuitable for a comprehensive statistical analysis. One reason for this is that the regular data collection in the Kazakh industry was subordinated to the needs of the Moscow center, therefore till 1990 only aggregated data was disclosed. The situation has changed since then, but the fast-moving economy has suffered from slow or rapid growth periods. The inflation rate is sometimes very high with two digits number, though sometimes much lower. As it is well known the Kazakh economy is very much dependent on the oil market. When the oil prices are high, our economy is growing fast, when it is lower our economy is slowing down. I could only create comparable time series if I had internal information about these processes. In the meantime, however, my relationship with the pharmaceutical sector was broken due to the scholarship. During my research activity, my interest also has changed. Although macroeconomic factors are playing an important role in the development of the pharmaceutical industry, external factors like oil prices are disturbing this picture so deeply, that it is almost impossible for an outsider, like myself, to separate the external factors from the internal ones. As I learned more and more in the PhD program, I had to realize that my original research questions moved far from me. A solid study based on statistics could be analyzed if there were adequate data, what is not the case. In the literature I have found more facts but less explanations or answers to my questions. Today I am more interested in what the reason is, why people - even the professionals - think about the so-called objective reality so differently. In the pharmaceutical and healthcare sector, I have also found that opinions are even more subtle, such as whether the patient can choose what drugs to take, or he must accept medications that are supported by health insurance? There are very different opinions about the advertising of medicines as well. There are some people who are very positive about advertisement, and there are others who are criticizing it because they are aware, that the advertisements are the main driving force behind the growth of the consumption of pharmaceuticals. During my research, it became clear

to me that I was more interested in subjective opinions. At the beginning of my research I was trying to rely on the so-called objective, professional opinions. The roots of my starting interest were my job experiences in my ministerial work. The second, not less important reason behind my new research orientation, that for a broad, rational questionnaire survey I did not have any financial resources, we had to look for a method that could be used with little financial resources and more personal involvement and could reliably prove my hypotheses. I chose the Q method at the advice of my supervisor Professor Sandor Kerekes.

In the first chapter of the dissertation I work on the literature, which I group around four dilemmas. With regard to the pharmaceutical industry, each of the four dilemmas can be considered a research question. The first dilemma: Generic or original drugs? The second: Innovate or die? The third: Producing or importing the drugs? And the fourth: More marketing than R&D? Of course, we could not find clear answers to these questions, so I called these dilemmas.

In the second chapter of the dissertation I analyzed the development of the pharmaceutical business between 2001 and 2017 based on the available statistical data.

The accurate statistics are often missing so we have to estimate the expenditure on Marketing and Sales as well as on Research and Development. We tried to focus on those companies in Hungary and in Kazakhstan where the appropriate data were available. We cannot generalize the results, which are based on two companies, one representing Hungary, this is Richter Gedeon and the other is a Kazakhstan pharmaceutical company Chempharm. Beside the market statistics, we are considering the regulation differences among the countries with special attention to Hungary and Kazakhstan. Currently pharmaceutical companies are spending proportionally less on Research and Development year by year. The development of new drugs is a costly and time consuming process. The research activity of creating new drugs requires billions of dollars and the licensing process may take some decades. The shortest time frame is at least 10-15 years. Economic growth is especially important for countries such as Kazakhstan, where the standard of living is still very low, so the government should encourage it with many measures. Kazakhstan's pharmaceutical industry is focused on the domestic market to meet domestic demand for pharmaceutical products at the expense of domestic producers by attracting foreign investment.

In the second chapter of the dissertation I analyze the situation of the Kazakh pharmaceutical industry. I pay special attention to foreign investments and international relations of Kazakh industry. The analysis shows that Kazakhstan's participation in some international conventions helps to create a monopoly situation and restricts competition, which can lead to higher drug prices.

In the third chapter I present the Q methodology used for empirical research, relying on the literature. Based on my own experience and the opinions of my former colleagues, I have tried to formulate statements that represent people's views on the pharmaceutical industry and healthcare in Kazakhstan. The Q methodology literature calls this concourse. Then I asked the opinion of twenty high-ranking intellectuals about the statements, and in the final part of the chapter I analyze the results and draw conclusions from them.

In the fourth chapter, based on the experiences of previous analysis and empirical research, I deal with the current development problems and opportunities of the Kazakh pharmaceutical industry.

The research questions and my hypotheses

The hypotheses can be divided into two groups. The first group includes my hypotheses that deal with structural changes in the pharmaceutical industry and can be proved by objective statistical data:

1. The sharpening competition should result in a price reduction. However, this is not the case in the pharmaceutical industry. Prices are rising due to increased marketing costs. Demand for industry products is increasing because people are increasingly willing to spend on their health.

2. The cost structure of the pharmaceutical industry has changed. At the moment, marketing is the biggest cost factor, while Research and Development costs represented the biggest cost factor until the turn of the century.

3. Some pharmaceutical companies specialize in generic medicines, which would justify a significant reduction in the cost of generic medicines, but this is not the case because most of the manufacturers are in a monopoly position in the markets concerned, partly due to drug regulation. The drugstore accepts certain import products, but not others.

4. Convergence is an important condition for emerging economies. Professionals agree that only the economy that is present in high value-added industries is successful. In the pharmaceutical industry, this means that it

cannot be specialized solely in the production of generic drugs. Emerging economies must also spend on pharmaceutical research if, due to a lack of economies of scale, the production of organic medicines will not be profitable. This is innovate or die dilemma.

5. The pharmaceutical industry is a strategic industry. Because of the security of the country, you cannot give up the ability to manufacture certain basic medicines. We cannot answer the question on the basis of economic considerations only to produce or import drugs. The country's security vulnerability is lower if at least the majority of generic medicines are produced by the local economy.

The second group of hypotheses are phenomena that can be explained by subjective factors. My research questions were:

1 What is the reason, why people - even the professionals - think about the so-called objective reality so differently? Why health-related public discourse is so diverse. Whether the patient can choose what drugs to take, or he must accept medications that are supported by health insurance?

2 There are some people who are very positive about advertisement, and there are others who are criticizing it because they are aware, that the advertisements are the main driving force behind the growth of the consumption of pharmaceuticals. Why their opinion is so different?

The Q method was used to reveal the opinions. According to my hypothesis, three main opinion centers can be distinguished:

1. The group of intellectuals who have closer ties with the pharmaceutical sector because of their qualifications or current jobs will have almost the same opinion about the pharmaceutical industry and drug consumption.

2. The second opinion group is made up of intellectuals and entrepreneurs who are only consumers in relation to drugs and their knowledge is influenced by their personal experiences with health care and possibly their knowledge acquired through the media.

3. I assumed that intellectuals, who spent longer period in higher education in the West, have been influenced by this, and it has a certain impact on their value judgment. I expect that their opinion is biased by the impact of the «consumer society» and the knowledge of the western pharmaceutical market.

The development of the pharmaceutical industry in Hungary and in Kazakhstan between 2001-2017

The pharmaceutical industry of Hungary is traditionally an important branch of the Hungarian economy. This sector is strongly export-oriented, and the only one which could maintain high R&D activities during the transition period, and only this was able to keep a relatively high investment level in the field of R&D. In Hungary the chemical and pharmaceutical industry is traditionally strong. This is because of the early specialization of the market during the Soviet period and the good tradition of the higher education in the field of chemistry. Some Hungarian chemists and physiologists got a Nobel prize for their discoveries, like Albert Szentgyorgyi 1937, Gyogy Hevesi 1943, Gyorgy Bekesi 1961, Janos Polanyi 1986, Janos Olah 1994. Although the majority of them got the Nobel prize not in Hungary, they studied or worked in Hungarian Universities in part of their life. Hungary invested a lot in this field for education and research. Organic and biochemistry is one of the success fields. Hungary has four medical universities and all of them are very successful even internationally. Chemical institutes at several Hungarian universities are equally important in developing new drugs. This creates a solid basis for the pharmaceutical industry to develop original drugs.

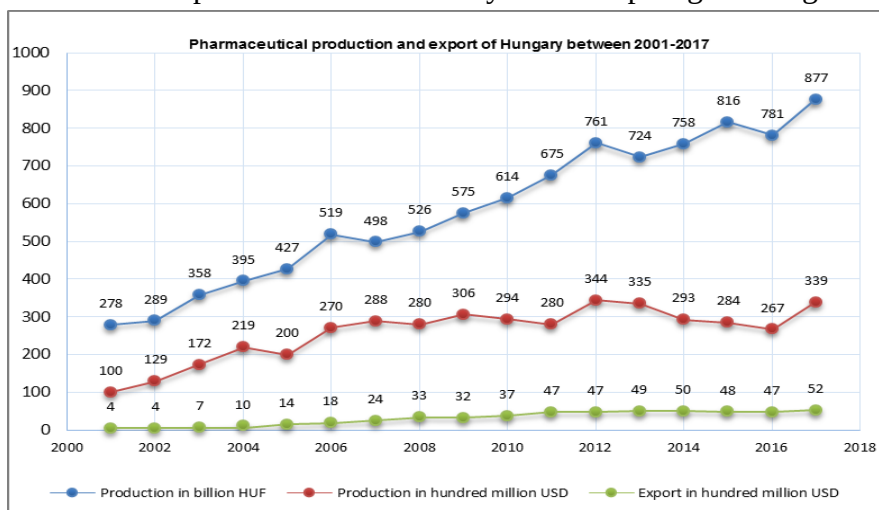


FIGURE 1. DYNAMICS OF PRODUCTION AND EXPORTS OF PHARMACEUTICAL PRODUCTS OF HUNGARY BETWEEN 2001-2017

Sources: (Hungarian Central Statistical Office, 2001-2017), (Trade statistics for international business development, 2001-2017).

High rates of economic development of Hungary were largely achieved through foreign capital investments. Over the past 18 years all major pharmaceutical companies have been privatized. Large stake in Chinoin

(Sanofi-France), EGIS (Servier-France), Biogal (Teva-Israel) Human (Novopharma-Canada) was purchased by foreign drug manufacturers. Richter Gedeon was privatized through an international private placement on the Budapest stock exchange.

It should be noted that in Hungary the market of pharmaceutical products is small, because of this the export takes a huge share of production. Hungary mostly exports pharmaceutical products to Europe, USA and CIS countries in the following areas: cardiological, psychoneurological, dermatological, gynecological, antifungal, antihistaminic, gastroenterological, and antiallergic and others.

The Kazakhstan pharmaceutical industry is more focused on the domestic market to meet the domestic demand in pharmaceutical products through domestic producers by attracting foreign investment. This is a task related to the high import of medicines, which is 78% (in value terms). Pharmaceutical industry of Kazakhstan is divided into two categories of production: 1) manufacture of basic pharmaceutical products - 12 producers; 2) pharmaceutical preparations – 65 manufacturers.

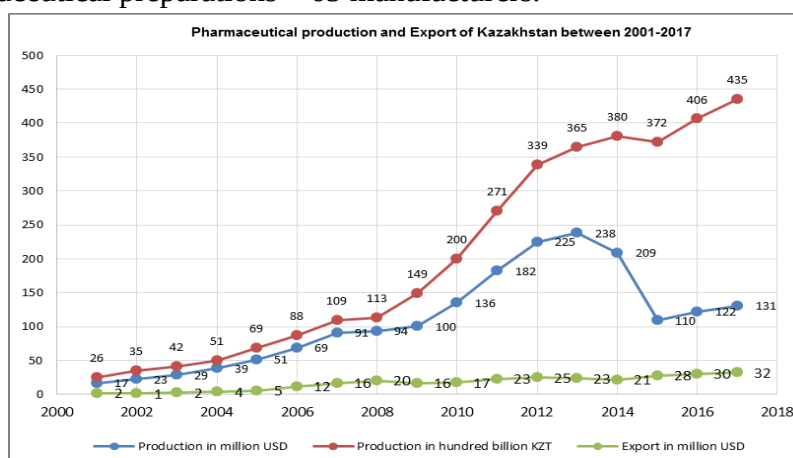


FIGURE 2. DYNAMICS OF PRODUCTION AND EXPORTS OF PHARMACEUTICAL PRODUCTS OF KAZAKHSTAN BETWEEN 2001-2017 YEARS

Sources: (Committee on Statistics Ministry of National Economy of the Republic of Kazakhstan, 2018), (Trade statistics for international business development, 2001-2017).

Kazakhstan's production of pharmaceutical products is not export oriented, but is gradually gaining momentum in 2017 having increased compared to the previous year and amounted to 32 million USD. Mostly exported to Switzerland, Kyrgyzstan and Russia, other medicines, veterinary vaccines

were sent to Russia and Kyrgyzstan for this period and clotting factors of blood of human origin were sent to Switzerland. Russia and Kyrgyzstan are the main export markets due to their geographical proximity to manufacturers of pharmaceutical products in Kazakhstan. The domestic pharmaceutical products are exported to other countries in small quantities.

In 2016 the pharmaceutical market in Kazakhstan showed a positive growth dynamic in the national currency. In dollar terms, the indicator was less in comparison with 2015 due to the instability of the exchange rate (see Figure 3 below).

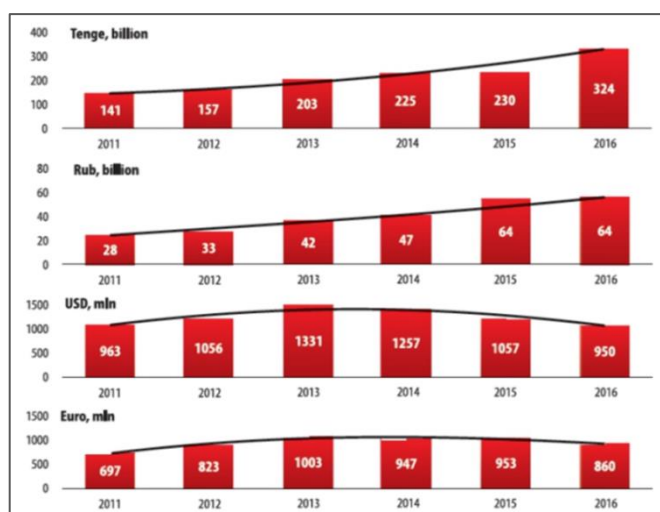


FIGURE 3. THE DYNAMICS OF THE GROWTH OF THE PHARMACEUTICAL MARKET FOR THE PERIOD 2011-2016

Source: (Consulting Group "Vi-ORTIS", 2018).

Pharmaceutical industry in Kazakhstan is heavily dependent on imports of pharmaceutical raw material (substances), equipment and packaging materials. The dominant position of generic drugs in the Kazakhstan market allegedly linked to the lack of conditions for the creation of innovative products. The bulk of the consumption drugs in Kazakhstan generic - about 90%, and the market of original drugs is no more than 8-10%, so that the production of generic drugs is the most attractive for increasing the share of domestic producers.

More than 80% of pharmaceutical products are produced in Shymkent and Almaty, while the shares of other regions are insignificant (below Map 1).

R&D expenditure and advertising costs with the profitability of the pharmaceutical market can be interesting (Acosta A & Ciapponi A, 2014).

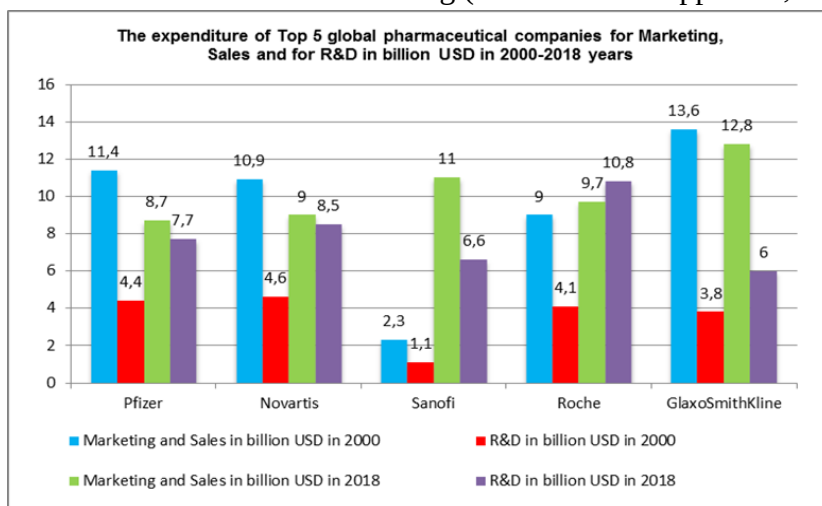


FIGURE 5. THE EXPENDITURE OF TOP 5 GLOBAL PHARMACEUTICAL COMPANIES FOR MARKETING, SALES AND FOR R&D IN BILLION USD IN 2000-2018 YEARS

Sources: (The 2018 Global Innovation 1000 study, 2005-2018), (Pfizer, Annual report, 2000), (Pfizer, Financial report, 2018), (Novartis, Financial report, 2000), (Novartis, Financial report, 2018), (Sanofi, Annual report, 2000), (Sanofi, Financial report, 2018), (Roche, Financial report, 2000), (Roche, Financial report, 2018), (GlaxoSmithKline, Annual report, 2000), (GlaxoSmithKline, Financial report, 2018).

Penetration of generic medicines is more successful in countries that permit (relatively) free pricing of medicines (Germany, United Kingdom) than in countries that have pricing regulation (Belgium, Italy, Spain). This is because countries that adhere to free market pricing generally have higher medicine prices, thereby facilitating market entry of generic medicines, and a higher price difference between originator and generic medicines (Bartosik M, 2005).

The situation is significantly different in many Central and Eastern European countries, where generics make up as much as 70% of all medicines prescribed in terms of volume, whilst in value terms generics represent only 30% of pharmaceutical expenditure. Consequently, the availability of affordable generic medicines in these countries, many of which joined the EU on May 1st 2004, is actually a major budgetary factor in both the retail and hospital sectors (The role of generics in Europe, 2010).

To analyze the European generic markets it is important to understand the core nature of national regulations on pharmaceutical products. They reflect the overall underlying national attitudes towards the provisions and financing of healthcare. The national regulations operating in a given market determine the structure and the environment, in which generic manufacturers need to function, commercialize and compete (A review on the European generic pharmaceutical market, 2005).

Generics make up the majority of the new countries' products, accounting for 60 percent of prescription volume in the Czech Republic, 70 percent in Hungary, and 77 percent in Poland. Branded generics are particularly popular, as they offer the dual benefits of lower prices and higher perceived quality. Because of the evolution of patent law, the «generics» category often includes products that are patented elsewhere (Clark T, 2004).

To understand the role of R&D in the pharmaceutical industry we have to compare it with other industries. We see in Figure 5 first is Pharmaceutical spent 180 billion USD on R&D in 2018, which was 90 billion USD in 2005. Computing and Electronics 170 billion USD in 2018 that shows an increase from 120 billion USD was spent in 2005. Also Software and Internet 165 billion USD was spent in 2018 and in 2005 it was 30 billion USD. Auto industry spent 130 billion USD in 2018 and 70 billion USD in 2005. In 2018 Industrials spent 90 billion USD and 40 billion USD in 2005. In the last thirteen years there are changes but Pharmaceutical is the first most research concentrated in the world and second is Computing and Electronics (See Figure 6).

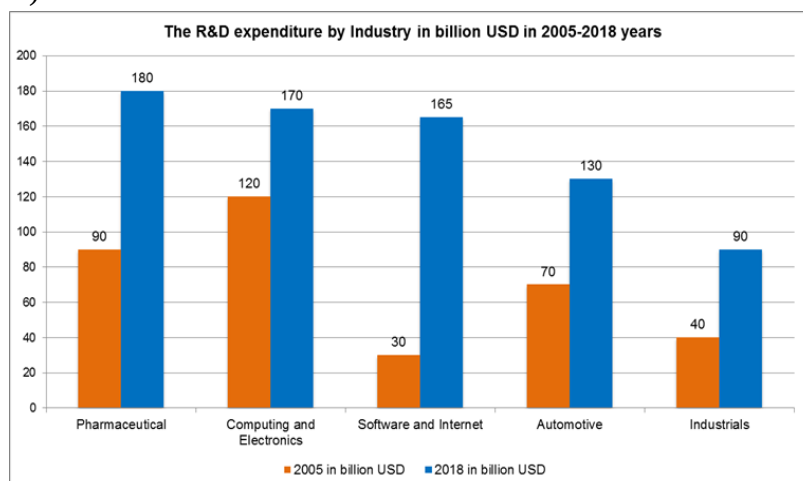


FIGURE 6. THE EXPENDITURE ON R&D BY INDUSTRY IN BILLION USD IN 2005-2018 YEARS Source: (Tech&Innovation, 2005-2018).

Figure 7. below shows the changes in the Marketing, Sales and R&D costs at Richter Gedeon pharmaceutical company between 2000-2015 years. As we see in Diagram 1 in 2015 Richter Gedeon spent nine times more on Marketing and six times more on R&D than in the year 2000, therefore the expenditure on marketing grew much faster than the expenditure on R&D, which is in harmony with the world trends.

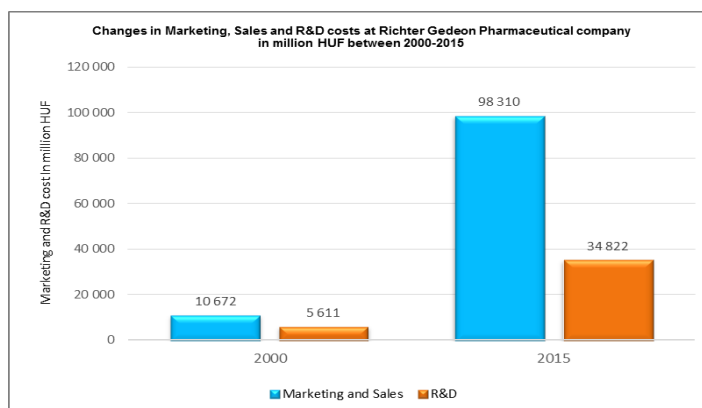


FIGURE 7. CHANGES IN MARKETING AND R&D COSTS AT RICHTER GEDEON PHARMACEUTICAL COMPANY IN MILLION HUF BETWEEN 2000-2015 YEARS

Source: (Richter Gedeon Delivering quality therapy since 1901, Annual Report, 2000-2015).

Richter Gedeon is the leader among the independent Hungarian pharmaceutical companies in investment in research, their share in the total turnover is almost 10%, which in absolute terms puts the company in the 1st place concerning the level of expenditure on R&D in the country and in Central and Eastern Europe as well (Report Hungary Pharmaceuticals&Healthcare, 2015).

The pharmaceutical companies spend €4.0 million on advertisements in medical journals in Hungary. The total amount spent by pharmaceutical companies on product advertisements in the 115 Hungarian printed medical journals came to almost 1.2 billion HUF in 2015 (€4 million), Comfit, a media monitoring company, which specializes in medical journals, revealed it to Central Europe Pharma News. The same companies spend 478.7 million HUF (€1.6 million) on advertising the companies themselves (not their products). Richter Gedeon led the field in terms of advertising expenditure, with a figure of 90.4 million HUF (€303000). In the second place there were Egis and Woerwag Pharma (Central Europe Pharma News Issue, 2013).

The pharmaceutical market of Kazakhstan was estimated at 950 million USD in 2016, the market is divided into retail pharmacy sales and government procurement. Out of these domestic productions of pharmaceutical products occupies only 22%. The main parts of the product portfolios of domestic manufacturers are low-profit generic drugs (share in the total market volume is 90%) and the market of the original drugs is 10%, which allows pharmaceutical manufacturers to allocate their profits on R&D of new original drugs.

The biggest Kazakhstan pharmaceutical company ChemPharm-Santo specialized in generic drugs spends much less on marketing than on production of generic drugs. Diagram 6 shows how the pharmaceutical company ChemPharm-Santo spends a very small share of its revenue of 15.1 million KZT on marketing. The production of generic drugs in 2015 produced 733.3 million KZT, however, in 2000 it produced more than 843 million KZT.

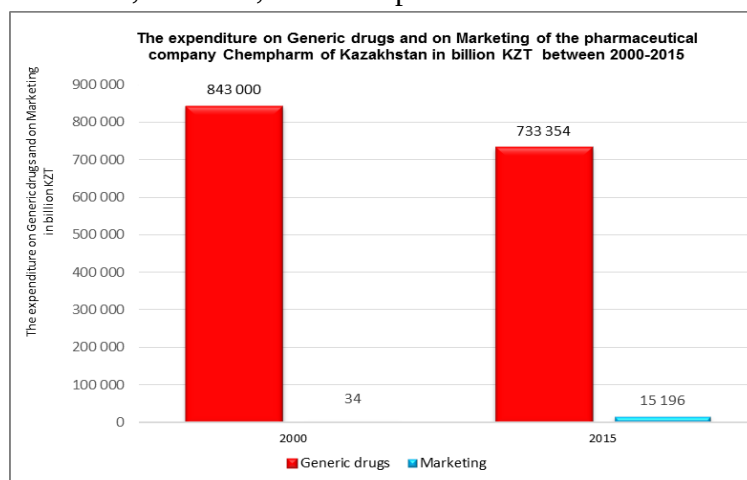


FIGURE 8. THE EXPENDITURE ON GENERIC DRUGS AND ON MARKETING OF THE PHARMACEUTICAL COMPANY CHEMPHARM OF KAZAKHSTAN IN MILLION KZT BETWEEN 2000-2015 YEARS

Sources: (Santo Member of Polpharma Group, Annual report, 2000), (Santo Member of Polpharma Group, Annual report, 2015).

Foreign pharmaceutical companies in Kazakhstan spend about 10-15% of annual turnover on marketing programs to introduce their products to doctors, including sponsoring a conference participation and publication. In the over-the-counter segment where direct advertising of medicines for consumers is allowed, foreign manufacturers also managed to increase their market share. Foreign pharmaceuticals increased their market share thanks to advertising, despite the fact that domestic medicines were cheaper, but they were not

properly advertised. In Kazakhstan imported branded generics and innovative drugs are very popular among physicians, and pharmacy staff often recommend patients who they cured.

The regulation of advertising and promotion of pharmaceutical products in the United States of America, Europe, Hungary and Kazakhstan. I consider how each country regulates the advertising of pharmaceutical products. In the United States marketing and distribution of pharmaceuticals is heavily regulated by the federal Prescription Drug Marketing Act.

In general, pharmaceutical companies adhere to FDA regulatory guidelines that require all DTC ads and information to be accurate in order to provide substantive evidence of any statements that have been made, to strike a balance between the risks and benefits of the product being promoted and to maintain consistency with the labeling approved by the FDA (U.S. Food and Drug Administration, FDA, 2017). Europeans still have quite limited exposure to pharmaceutical advertisements for prescription drugs. The EU is of particular attraction to pharmaceutical companies, however, as it accounts for a full one-third of global drug sales. In Europe, the advertising is regulated by the International Federation of the Pharmaceutical Industry Manufacturers and Associations (Eagle L & Kitchen P, 2002).

Methods used for empirical analysis

From the point of view of my dissertation, the Q method is just a tool. It is not my task to develop further the Q methodology itself. I want to use the Q methodology for cognition of Kazakh pharmaceutical industry and Kazakh drug-related opinions. The method makes it possible to understand the structure of opinions and views on the manufacture and use of the drugs as well as the relationship between the different views about these topics. In the Q method, all of the opinions and views about the topic are called «concourse». «In Q, the flow of communicability surrounding any topic is referred to as a concourse (from the Latin concourses, meaning all running together», as when ideas run together in thought).

In my case, considering the mathematical assumptions of the factor analysis methodology, and the experience of the Q method, we need about forty statements that meet the requirements of the method and adequately represent the concourse of the problem under examination. Of the seventy statements, we could have missed a lot because they were the ones that were in complete agreement with the ad hoc groups in which the relevance of the claims was tested. We left some statements out because the interpretation also caused problems for the panel during the discussions.

The steps of investigation in the Q method:

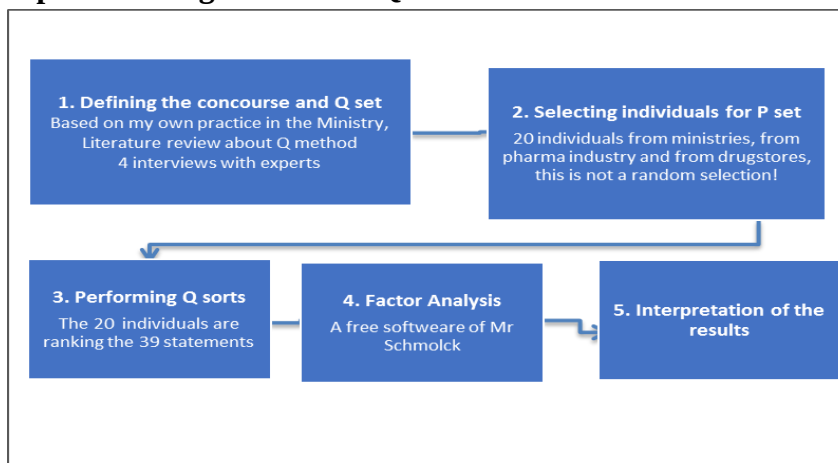


FIGURE 9. THE STAGES OF Q METHOD

Revealing the Kazakh pharmaceutical concourse and creating the statements

In my case, formulation of the concourse was not a simple task. During the years I spent working in the pharmaceutical department in a senior position, I learned the opinions of a number of experts. It became apparent from the friends' inquiries, that the so-called ordinary man rarely meets the opinions of professionals. Concourses are considered appropriate if they represent the opinion of the multitude of people involved and if they are able to reveal the different clusters of views and the differences among them.

In the first round, we made almost seventy statements partly based on our own experiences, partly based on the experience found in the literature and based on research on the health sector of using the Q method. Considering the selection of respondents, I could expect about twenty respondents who are expected to conscientiously evaluate the allegations.

The 39 statements were translated into Russian and had been distributed among the cells by each of the individuals in the following triangle. This procedure is called: Q sorting. I could have used a variety of triangles, but this would not significantly affect our results, as can be seen from the following quote:

The 39 statements, according to the logic of Q method, in order to provide a discrete normal distribution, sample members had to position 39 squares of the following triangle below.

The distribution among the cells took 30 to 45 minutes for each participant. At first, they were averse to the task. Many people have challenged us, why the method narrows their choices into this framework.

At first, many people had problems with why there could be no more than two of the total agreements or the total number of denied claims. Later, they were reconciled to the task and after about 10 minutes they went into the task and later, several people said they considered it a challenge and, finally, they were particularly interested in stumbling on statements and placing them in the appropriate cell. The members of the group solved the task one by one within a three-week time interval when I personally visited the group members and with some of them managed to make a structured interview, which is described in the evaluation part of my dissertation.

1. The pharmaceutical industry spends an unreasonably lot of money for advertisement of drugs.
2. Pharmaceutical advertisement is very useful because the consumers are getting very useful information through it about new drugs.
3. Most doctors prescribe conventional and well-known drugs.
4. It would be desirable to monitor the R&D activities of pharmaceutical companies more closely.
5. The price of medicines should be determined by the state.
6. It is advisable to keep the medicines for acute diseases at a persistently low level.
7. People are consuming unnecessarily many medications. It would be reasonable to sell the drug for medical prescription only.
8. The pharmaceutical industry is one of the most profitable industries. For international firms the profit is more important than the healing of diseases.
9. The pharmaceutical industry should operate based on the same ethical principles, like the doctors. The profit is secondary.
10. The income of doctors largely depends on their relationship with the pharmaceutical industry, this undermine the credibility of the doctors.
11. The drug consumption is unjustifiably high.
12. The aim of marketing is to know and understand the customer so well the product or service fits him and sells itself.
13. Understanding patient behaviour is essential to influencing them.
14. Models of consumer behaviour can help pharmacists increase medication adherence, change smoking behaviour, communicate health messages, design services, and influence physician prescribing.
15. Some patients have more diseases and they get treatment for them. Used drugs interact. We need independent research to study this issue.
16. The pharmacy store should be an intimate private area where the consumer and the pharmacist can discuss how the consumer should use her/his medicines.
17. The customers can use the competence of the pharmacists as support, when they decide what drugs to take, and when to take them.
18. The pharmacist should make a thorough professional review of each drugs bought by the consumer.
19. The pharmacist should confirm to the consumer that the chosen drug is safe for use.
20. The pharmacy should be like a health marketplace, where consumers can get drugs, lifestyle advice, blood pressure measurements or whatever they need.
21. The pharmacy I leave with good questions for the physician visit when I have discussed my drug use with the pharmacist.
22. The pharmacist knows the medicine better than the physician, so it is advisable to ask him before the prescription of the medication.
23. The pharmacist's connections with the physicians make it 100% certain that everybody get the right drug on.
24. When a consumer has questions about his/her drugs, the pharmacist should answer them.
25. Each drug has side effects, to use them for medication is based on the patient's assessment of risks versus benefits.
26. The use of a drug is enough a belief that the disease will get better with treatment.
27. The protection of intellectual property is a barrier to scientific progress. If world scientists could make their findings public, they would have solved a few diseases.
28. From a business interest, they also buy patents that they do not want to use. This slows down scientific progress.

29. Most of the innovations are not born today because explorers "want to make the world better", but from business interests or research fame.
30. Research across the world of pharmaceuticals with minimal coordination would be enough to treat illnesses that affect only few people or poor people.
31. The branded drugs in the world are much more expensive than the quality difference justifies. The success of the drug is largely based on marketing.
32. A researcher, when he discovers a new drug, is best sold to his patent to world business.
33. In the pharmaceutical industry, research and licensing costs are so high that small-scale small companies can maintain a meaningless research laboratory.
34. Newer pharmaceutical companies are trying unnecessarily with research, and market success cannot be achieved.
35. In all countries it is advisable to maintain laboratories for pharmaceutical research, not because they could expect economic results, but because without that, the country would still be unable to follow the development of world science.
36. There are some types of drugs that are used to treat the most important for life, but with the quality of life ethically questionable.
37. People trust local pharmaceutical drugs because of their quality-price ratio.
38. The quality of pharmaceutical drugs satisfies the need of local consumers.
39. In Kazakhstan, Ukrainian, Russian and Belarusian medicines are more recognizable than medicines from Europe and the USA.

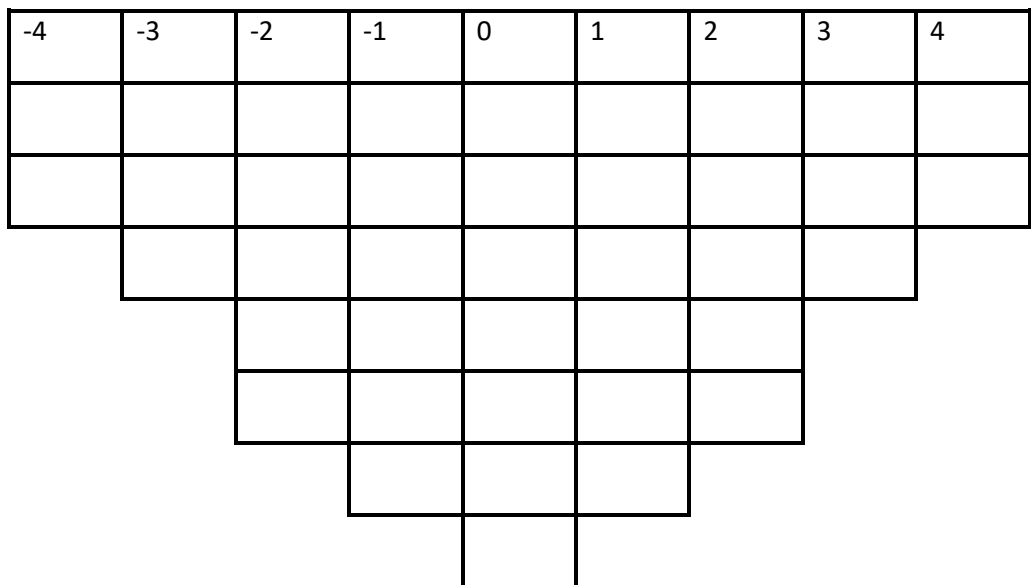


FIGURE 10. THE FORCED-DISTRIBUTION Q SORTS TRIANGLE FOR 39 STATEMENTS

In my investigation the P set were created from twenty respondents who formed a heterogeneous group. All of them are graduates of universities, some of them have graduated abroad. Some have established their own companies or leading industrial companies. Significantly public employees were involved among the respondents, which obviously influenced their opinion.

The selection of the sample, despite some inconsistencies, followed the logic of wanting to find out whether those who are in close contact with the pharmaceutical industry because of their day-to-day work because they are in

such companies or they may be working in a pharmacy or knowing about their work through healthcare, and how do the so-called non-professional opinions differ and how do they match the opinions of professionals? It was an exciting question to see whether the foreign studies, already developed in market economies, have an impact on foreign studies.

The 20 persons, although they form a heterogeneous group, can be divided into three groups with respect to their values. According to my hypothesis, the intellectuals who have closer ties with the pharmaceutical sector because of their qualifications or current jobs will have almost the same opinion about the pharmaceutical industry and drug consumption. The other opinion group is made up of intellectuals and entrepreneurs who are only consumers in relation to drugs and their knowledge is influenced by their personal experiences with health care and possibly their knowledge acquired through the media. In my hypothesis, I also assumed that intellectuals, who spent longer period in higher education in the West, have been influenced by this, and it has a certain impact on their value judgment. I expect that their opinion is biased by the impact of the «consumer society» and the knowledge of the western pharmaceutical market.

		1	2	3
1	Gulnur	0.62 X	-0.10	0.08
2	Nurgul	0.53 X	0.18	-0.36
3	Zhuldyz	0.36	0.54 X	0.19
4	Askar	0.62 X	0.38	-0.22
5	Zhandos	0.05	0.51 X	0.12
6	Ahmed	0.52 X	-0.48	0.11
7	Zhaslan	-0.24	0.57 X	-0.39
8	Turar	0.70 X	0.29	0.17
9	Asel	0.12	0.52 X	-0.29
10	Dinara	0.08	0.19	0.41 X
11	Svetlana	0.22	0.51 X	-0.38
12	Zhanibek	0.13	0.44	0.63 X
13	Ardak	0.39	0.50	-0.40
14	Azamat	0.37 X	0.25	0.13
15	Arman	0.26	0.59 X	0.42
16	Ainura	0.50 X	0.11	-0.37
17	Dana	0.70 X	0.03	0.17
18	Roza	0.59 X	-0.34	-0.09
19	Darhan	0.58 X	0.45	0.28
20	Diana	0.86 X	-0.05	-0.13

FIGURE 11. THE FACTORS

When exploring concourse, we began by considering that there was a significant difference in opinion among respondents about their relationship with the pharmaceutical sector. People - and in this respect Kazakh are no exception - tend to think in stereotypes. With regard to the pharmaceutical industry, such a stereotype may be that drugs are expensive because they

come from imports. Others say that the main reason for this is that they spend too much on advertising in the pharmaceutical industry and do not spend enough on drug research. According to other stereotypes, it is unnecessary for a small economy to develop its own pharmaceutical industry, because the research of original drugs is only rewarding for multinational companies with a strong capital. In developing countries, there is a relatively widespread view that, without their own research and development institution, it is impossible to catch up with the developed regions. Therefore, the pharmaceutical industry needs to be developed even if it does not seem economically rational. The state must definitely regulate and support the pharmaceutical industry. The 39 statements made should represent this diverse picture in a representative way. We hoped that the 20 people interviewed would express their opinions and identify certain types of opinions. At the start, we expected to be able to identify at least three types, and we assumed that each type would be related to the person's qualification or job.

The result of the factor analysis

When we dealt with the types of opinions, exploring the concourse, we were expecting three types. At the end of the analysis, the following three types were identified based on the Q method:

1. type Positively biased pharma-experts (Committed Pharmacists) They form a center of opinion and agree that doctors tend to prescribe only the medicines they know, who consider the pharmaceutical industry to be a very profitable industry, and who think foreign manufacturers are too profit oriented. Their professional commitment is also reflected in the fact that pharmacists are highly respected. Pharmacists believe that they should also perform other services for the benefit of society.

2. type Some scepticism against the pharma sector (Doubt about the medical sector). They are engineers, economists or language teachers according to their qualifications. One of them was originally a chemical engineer, this qualification is professionally close to the pharmaceutical industry. One of them a financial economist who now works as a project manager and is therefore reasonably skeptical about the pharmaceutical potential of a relatively small economy. for Kazakhstan it does not seem appropriate to produce medicines that require serious research, production and distribution. This may be good in other countries. At the same time, Kazakhstan should still produce medicines that are the easiest to manufacture

and can be consumed both in the domestic market and exported to other countries.

In this regard, each country is unprofitable to produce all the drugs and Kazakhstan is recommended to find its niche in world trade.

3. type Marketed and/or socialized health care (Marketizing the pharmaceutical sector) «Marketed and/or socialized health care» is a mixed type, with sometimes contradiction viewpoints. This type is represented by two persons: Dinara and Zhanibek, both of them working as leader and they studied earlier in the West. In the one hand this type is very much market oriented, some of their values are similar to those who are living in advanced market economies. This type tries to reconcile contradictory opinions. On the one hand, they affirm the market economy, on the other hand, they also consider the ethical and welfare aspects to be important in the day-to-day operation of the health sector. They are clearly open to accepting «western» culture and values, which are largely individualistic and market values, (but at the same time affirm the «caring» institutional system the profit is secondary. 7. People are consuming unnecessarily many medications, it would be reasonable to sell the drug for medical prescription only. 27. The protection of intellectual property is a barrier to scientific progress, if world scientists could make their findings public, they would have solved several diseases.).

Risks affecting the development of the pharmaceutical industry of Kazakhstan, the problem is the economy of scale or more

In comparison with world costs, the volume of investments in this sphere is much lower. At the same time, the process of developing medicines takes an average of 10-15 years, which makes the pharmaceutical industry quite knowledge-intensive. The emergence of new drugs involves the passage of long, long and costly clinical trials. In addition, not all domestic manufacturers of pharmaceutical products have modern technologies to produce original drugs from testing and production of new drugs to their introduction.

Administrative barriers, which include complex procedures for laboratory analysis, lengthy consideration of registration of medicines, procedures for multiple re-registration (up to 6 months) of drugs also adversely affect the development of the industry. Domestic producers can incur tangible losses as a result of going through lengthy administrative procedures.

The imperfection of the post-registration monitoring system for the safety and efficacy of medicines is noted on the market of medicines. Consequently, in clinical practice, when deciding on the use of medicines, there is insufficient data on the safety and efficacy of the drugs.

In the Republic of Kazakhstan for several years, the introduction of international standards GXP in the pharmaceutical industry of Kazakhstan is an actual direction. The need for innovation is not in doubt, and the requirements for the transition to GXP standards by 2018 are legally enshrined in the Code of the Republic of Kazakhstan «On the Health of the People and the Health System». Thus, the implementation of the international standard GPP (good pharmacy practice) will help improve the quality of drugs. However, there are risks of reducing competition and access to drugs by reducing the number of pharmacies. The risk to a greater extent may be provided by pharmacy institutions located in rural areas.

One of the limiting factors in the development of the pharmaceutical industry is the high demand for qualified personnel. In the market there is an insufficient level of professional training and a shortage of qualified personnel. To improve the skills of new employees, companies at their own expense conduct training and internships.

The discipline of clinical pharmacology is rapidly developing on the world pharmaceutical market. Clinical pharmacology studies various problems of drug therapy - the methodology of clinical trials, the metabolism of drugs, molecular pharmacogenetics, the analysis of drug intake, etc. The main direction of this discipline as a specialty is the study of questions concerning the health of patients. Specialists working in this field are trying to narrow the gap between drug manufacturers and clinicians. At present, there are about 200 clinical pharmacologists in Kazakhstan, of which only 5% are graduates, the rest have certificates. Moreover, there is no status of clinical pharmacologists, regulatory legal acts, quotas for training in the specialty of «clinical pharmacology».

In the portfolio of domestic pharmaceutical manufacturers there are obsolete and low-profitable generic drugs, which prevents the provision of the population with domestic products that meet international standards and technical regulations. Thus, in the pharmaceutical market of Kazakhstan there is a problem of poor quality of medicines.

The backwardness of domestic technologies for the production of medicines does not allow import substitution of medicines. Domestic production is unable to completely cover the needs of the Kazakhstani pharmaceutical

market with medicines on the main pharmacotherapeutic groups (the share of domestic drugs is 10%). Under the existing conditions, the import substitution process will be lengthy due to administrative barriers (changes in the legal framework are required), lack of financing for the re-equipment of production facilities, and updating of the pharmaceutical portfolio. On average, the modernization of production takes 3-4 years. In the process of reconstruction, it is also necessary to maintain the existing production process, train the personnel, switch over to the assortment.

Another problem in the domestic market is the lack of own innovative drugs. Kazakhstan is the country of release, mainly of generic drugs. The most of domestic producers' products consists of low-margin medicines, which prevents the allocation of the required amount from the proceeds for R&D.

In Kazakhstan, there is a decline in the clinical trials market. So, in 2015, only 12 clinical trials were conducted, which is 3 times lower than in 2014. All clinical trials were conducted only by domestic manufacturers. The decrease is due to the obsolete regulatory framework, as the Rules for the conduct of clinical trials and (or) trials of pharmacological and medicinal products, medical devices and medical equipment were approved in November 2009. The main barriers for attracting international clinical research to Kazakhstan include insufficient experience of the country's participation in clinical research; absence of a register of clinical studies conducted in Kazakhstan; insufficient number of medical institutions for conducting clinical trials, since mainly clinical research is carried out by universities and research institutes; insufficient number of experienced researchers. Insufficient number of research institutions reduces the country's attractiveness for conducting clinical trials. Terms for the approval of clinical trials, which are 120-160 days are a barrier to the participation of Kazakhstani medical institutions in international clinical trials. In addition, there is no regulatory procedure in Kazakhstan that regulates the importation of equipment and medical devices for clinical trials.

Conducting international clinical research affects the development of medical science in terms of improving the level of skills of medical personnel, transfer of advanced technology. The sponsor of the Clinical Research provides equipment, which is then donated to the clinic for free. Thus, the conduct of clinical research can become a locomotive for the development of medicine. The main barriers to conducting clinical trials in the Republic of Kazakhstan are the incompatibility of medical organizations with the criteria for

accreditation for conducting clinical trials, as well as the shortage of qualified specialists with GCP certificates.

The aim is a theoretical review of the export and import of pharmaceutical products. We studied the dynamics of export and import of pharmaceutical products from Kazakhstan and Hungary between sixteen years. Calculations of exports and imports of pharmaceutical products per capita compared with GDP per capita in Kazakhstan and Hungary for the period 2001-2018. Priorities for the development of the Hungarian pharmaceutical industry and export orientation have been determined, than on the domestic market, also the development strategy for the pharmaceutical industry in Kazakhstan, which is oriented to the domestic market with a small share of exports.

In recent years the trade and economic relations between Hungary and Kazakhstan has developed successfully in such areas as energy, food, pharmaceuticals, engineering, education and tourism. Kazakhstan is the third partner in the trade turnover of Hungary after Russia and Ukraine, despite the geographical distance of the two countries.

The aim of the research is to show the effect of the pharmaceutical export on the economic growth of Hungary and of Kazakhstan between 2001–2017 years. Any national economy in its development strives to achieve economic growth to increase the pace of growth of gross domestic product per capita. The economic growth especially important for countries as Kazakhstan where the living standard is still very low, so the government should stimulate it with many measures.

The expenditure for Marketing, Sales and R&D of pharmaceutical products in Hungary. Among the independent Hungarian pharmaceutical companies Richter Gedeon is a leader in investment in research, their share in the total turnover is almost 10%, which in absolute terms puts the company in the 1st place concerning the level of expenditure on R&D in the country and in Central and Eastern Europe as well.

The Expenditure on generic drugs and on Marketing of pharmaceutical products in Kazakhstan. The biggest Kazakhstan pharmaceutical company ChemPharm specialized in generic drugs spends much less on marketing than on production of generic drugs. Foreign pharmaceutical companies in Kazakhstan spend about 10-15% of annual turnover on marketing programs to introduce doctors their products, including sponsoring a conference and publication. In the over-the-counter segment where direct advertising of medicines for consumers is allowed, foreign manufacturers also managed to increase their market share. Foreign pharmaceuticals increased their market

share thanks to advertising, despite the fact that domestic medicines were cheaper but they were not properly advertised. In Kazakhstan imported branded generics and innovative drugs are very popular among physicians and pharmacy staffs often recommend patients who they cured.

Sources of data include the Tech&Innovation, 2005-2018, Strategy&pwc, The 2018 Global Innovation 1000 study, 2005-2018: Top 20 Research and Development Spenders 2005-2018, Annual reports of pharmaceutical companies 2000-2018, Hungarian Central Statistical Office, Market of pharmaceutical products in Hungary, Committee on Statistics Ministry of National Economy of the Republic of Kazakhstan, Trade statistics for international business development, Teaching the Q Method in a class on urban sustainability, Richter Gedeon Delivering quality therapy since 1901, Annual Report 2000-2015, Report Hungary Pharmaceuticals&Healthcare - 2015, Santo Member of Polpharma Group, Annual report-2000, Santo Member of Polpharma Group, Annual report-2015.

Recommendations and conclusions

The possibility of creating an innovative base of pharmaceutical enterprises can be a gradual transition from the production of simple generic drugs to more complex ones. At the moment, the CIS countries have their own generic productions. For this reason, further expansion of Kazakhstani exports to the CIS countries will be conditioned by the capabilities of domestic producers to offer competitive innovative products or analogs of unique complex drugs. The innovative potential of Kazakhstan pharmaceutical enterprises directly depends on the provision of state support and the creation of an innovative climate. In order to further obtain technological and personnel competencies in the production of innovative drugs, it is necessary to attract leaders of the pharmaceutical market. The interest of foreign investors is due to the availability of storage facilities at the Kazakh side, as well as the infrastructure. As part of the development of the domestic pharmaceutical market, it is necessary to improve the registration of undesirable side effects of drugs in identifying serious or unforeseen adverse reactions with the decomposition of the list of reimbursable medicines. To introduce new qualifications for the pharmaceutical industry, cooperation between higher education institutions and pharmaceutical enterprises should be strengthened. In this regard, it is necessary to create a platform for discussing topical issues and problems in the field of education, which can reduce the existing gap between the education received and the real needs of pharmaceutical

enterprises. Thus, educational programs should be taught in accordance with GMP standards, which would further facilitate the work of the pharmaceutical complex after the introduction of the international standard of GMP and in the future would allow the creation of competitive production.

To achieve high production of pharmaceutical products, it is necessary to increase the level of state support for the industry. Measures should be envisaged for producers of domestic pharmaceutical products:

- receiving loans guaranteed by the government with a deferred payment and partial reimbursement of the loan from the republican budget;
- financial support from the state when registering domestic drugs abroad, buying licenses and raw materials;
- exemption from payment of import customs duties on equipment necessary for the investment project;
- development of mechanisms for the inclusion in the existing long-term contracts of new, innovative medicines produced by domestic producers that have evidence-based medical effectiveness;
- development of a mechanism for redistributing the supply of drugs between domestic producers, in case of failure to fulfill the declared obligations under long-term contracts;
- strengthening the position of domestic pharmaceutical companies by stabilizing existing measures of state support (primarily in the framework of the state order);
- development of new mechanisms to stimulate investment in the pharmaceutical industry, which should create conditions for a new qualitative growth in domestic production of pharmaceutical products in the long run;
- monitoring of new categories of diseases that tend to spread in Kazakhstan, as well as in other countries;
- establishment of centers for the development of new medicines for the planned import substitution of medicines;
- approval of specialties for the development and production of medicines in higher and specialized educational institutions, as well as training specialists considering international standards of GMP.

In addition, it is necessary to maintain the level of purchased pharmaceuticals within the guaranteed volume of free medical care because of their great social importance. From the state side, it is necessary to provide support to domestic pharmaceutical enterprises in the form of preferences and benefits.

New scientific results

1. Numerous analyses have been conducted for both the Hungarian and Kazakh pharmaceutical industries. These analyses also include international comparisons. My analysis is specific because it compares the pharmaceutical industry of two countries that used to belong to Comecon Countries. Despite differences in population and level of development, it can be concluded that this comparison is more instructive for Kazakhstan than if I compared Kazakhstan's pharmaceutical industry with more advanced European countries, such as Denmark's or the Switzerland's pharmaceutical industry. Based on this comparison I could define my recommendations for the government.

2. The pharmaceutical industry is still one of the most research-intensive sectors today. And indeed, it is. In the business world and in the pharmaceutical industry in particular, it is considered natural and widely accepted that marketing costs have risen much faster than research costs over the past few decades. Because of the high marketing costs, pharmaceutical prices are high, so drugs are not accessible to the poor. Advertisements cause unreasonable drug consumption, which, in addition to health hazards, makes it impossible for the drug store to function effectively. Pharmaceutical prices are factors determining human well-being. The drug marketing in Kazakhstan is now emerging. It should be brought to the attention of the authority that this area should also be regulated. One of the scientific results of this dissertation is this early warning.

We recommend the Governments and the International institutions to implement means which drive the pharmaceutical companies back to research. The governments should set limits for the advertisement in this field. They have to promote the open and the crowdsourcing innovations to make this kind of public good affordable for the poor as well.

3. The Q method is widely used in the world to explore the attitudes of the consumers. The method helps to structure development ideas of industrial sectors. I think it is a new result of my own research, that despite the cultural differences, the method can be applied without difficulty for revealing the drug-related concourse of Kazakh people. Neither the statements nor the results differ from those used in international practice.

I consider it a new scientific result that Kazakh intellectuals, who are having mainly technical and economic background, can be classified into three opinion types: 1. Positively biased pharma-experts; 2. Some scepticism against the pharmaceutical sector (Doubt about the medical sector). 3.

Marketed and/or socialized health care (Marketizing the pharmaceutical sector) The existence of these main types is proved by my own practical experience and the structured deep interviews presented in the dissertation as well. The types are extensively described in the dissertation and in the theses above.

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