THE SPATIAL DIMENSION OF THE DRUG TRADE IN ROMANIA

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ABSTRACT

The world pharmaceutical market is constantly growing. This market is the major element of foreign investments in health. It is considered that the pharmaceutical industry is known as the most profitable industry with research and development activities. Pharmaceutical products are the most important health related products, which are traded, accounting for 55% of the total health trade.

The study follows the spatial design of the dynamics of drug trade, an economic activity with a particular dynamic influenced by a complex of factors. The research was carried out starting from a database that includes the number of employees, turnover, profit and number of companies in this field, for the period 2000-2018. In order to obtain the spatial dynamics of the drug trade, a series of cartographic models were developed regarding the four indicators, using the open-source QGis platform.

The obtained results showed the complex of determinants of regional disparities in the trade in medicines, the most important being the level of economic development at the level of territorial administrative unit, as well as the regional demographic particularities.

Keywords: drug trade, regional disparities, spatial pattern

INTRODUCTION

Pharma is a special industry [1], one of the reasons is because it's referring to healthcare of people. The other one is because the global pharmaceutical industry reached in 2018 an unprecedented height, being estimated at an astounding $1.11 trillion. By 2020, it is supposed to rise to $1.43 trillion. Pharmaceutical companies most important endpoint is the patient. Having this in mind, the role of those is to ensure patients with the most innovative and cutting-edge treatments. Being a research-driven industry, a significant amount of the profit is reinvested in the research and development, R&D [2]. It can be either done internally in the company, or in partnership with government and nonprofit educational and research institutes all around the world [3].

Nowadays, the healthcare is changing and growing, people want to live longer, be healthy, have a healthier lifestyle so if the healthcare expectations increase, so does the costs to develop and meet their needs. And the market is a global one with a large number of patients, therefore a high consumption daily of millions of doses [4]. Also, the population is aging, so the chronical diseases are increasing which means that the need for the

medicines grows. Depending on the country with an emerging or developed economy, the capacity to pay for the treatment varies, so does the therapeutic options [5].

Emerging markets represents an exceptional opportunity for the pharmaceutical industry because they have a prosperous development and the investments made in those countries are expecting to result in higher incomes despite the risks which are also high and possible. Pharma emerging markets registered a rapid growth due to several factors. The first factor is the patent cliff that affected plenty of drugs that have been on the market for a long period of time. The second one is the generic and biosimilar drug industry. The evolution of a disease and the new pattern of it represent another important factor. But probably, the factor with the greatest impact in the pharma growth is the difference between the manufacturing costs and the final price of the medicine [6].

In the countries with a developed economy, so a developed market, a new medicine before is introduced, it's evaluated by the health authorities through a heath technology assessment (HTA) tool which provides accurate information about the efficiency of the drug, the results and the total costs of the treatment. However, the emerging markets, which gather the majority of the population, use less this HTA tool to evaluate a new drug, therefore the entry of innovative drugs is diminished. This is also reinforced by the high percentage of generics that comprise this emerging market, between 60% to 80% of the total volume of pharmaceutical market [7].

For Romania at birth, life expectancy is 75 years, compared with the EU average which is 80.9 years (2014). The indicators which compare Romania with the other EU countries regarding the health status reveals a high mortality rate for cardiovascular diseases and stroke, and a high infant and maternal mortality [8]. The Romanian health status is closely connected with the population living standards, working conditions, social-economic system, lifestyle and is determined by the access to health services [9], [10]. All of these are further connected with the consumption of medicines, respectively their trade on the Romanian market. In September 2019, Romania, was promoted an emerging market from the previous status, of a border market, according to Financial Market [11], [12], [13]. This, should give Romania a greater openness to innovation and access to it.

METHODOLOGY

The focus of this study is Romania, the eighth largest country in the European Union (EU) (237,500 km^2) and the seventh largest in terms of population and analyzes the spatial dimension of the drug trade on the basis of four economic indicators - number of companies, turnover, number of employees and profit.

Table 1. NACE code for drug trade sector

NACE code	Pharmaceutical activities	Field of activity according to NACE
4646	Wholesale of pharmaceutical goods	WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES

The dynamics and distribution of the drug trade in Romania were analyzed for a period of 19 years, the period between 2000 and 2018. The spatial distribution is analyzed by highlighting 4 years considered relevant to the study: 2000 (the first reference year), 2008 (the beginning of the economic crisis), 2009 (the year in which the effects of the economic crisis are felt) and 2018 (the last reference year).

An economic database was created at the level of the administrative-territorial unit, highlighting 4 relevant economic indicators for analyzing the trade in drugs (number of

companies, turnover, number of employees and profit), according to the Classification of National Economy Activities (NACE). The NACE code for the drug trade sector is represented 4646 - Wholesale of pharmaceutical goods included in Wholesale and retail trade; repair of motor vehicle and motorcycles field of activity (Table 1).

Using the QGIS 3.4 open-source software, were created maps for the four years considered relevant to the study (2000, 2008, 2009 and 2018), for the 4 indicators, using centroid type filling with simple symbol, and the symbol size increases as the number of elements in a territorial administrative unit increases (number of companies, number of employees, turnover and profit value), in a gradual color scheme.

The graphical models show the evolution of the indicators, with the highlights of the maximum value for each indicator.

The values for turnover, for a better analysis, are expressed in the national currency (Lei), thus that at the course of the National Bank of Romania 1 euro represents 4.75 Lei.

RESULTS

Number of companies
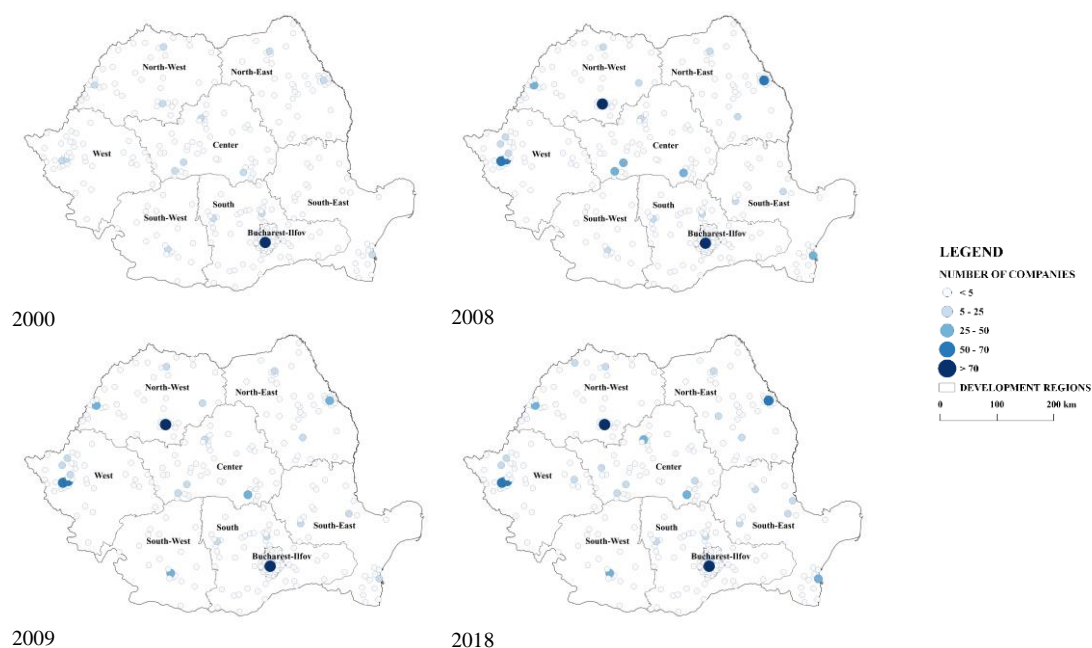
Figure 1. Spatial distribution of companies in the drug trade sector in Romania
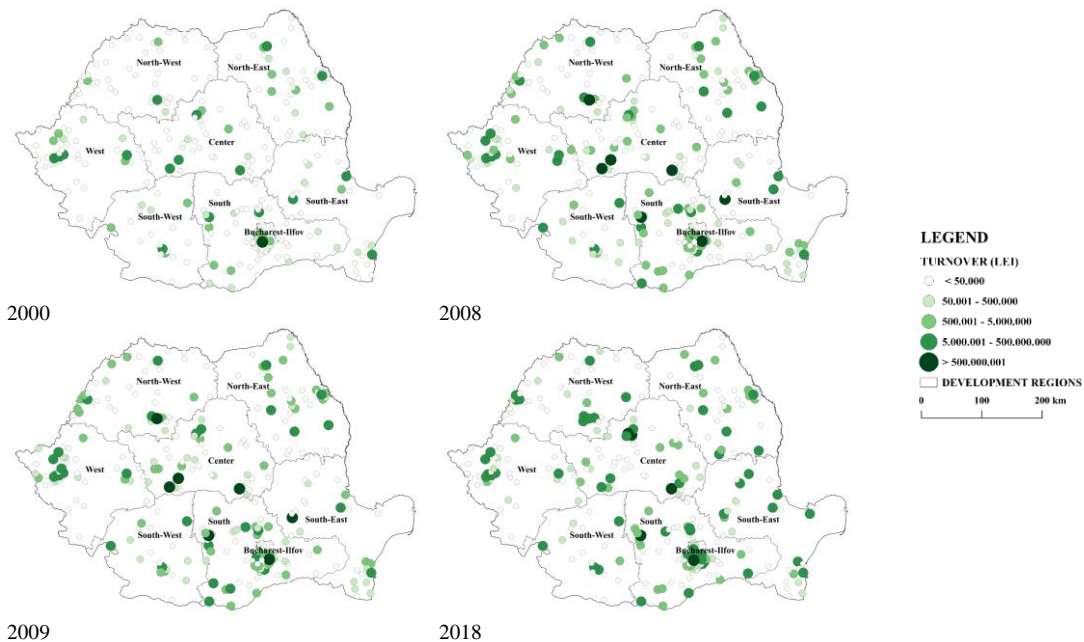Source: UB/1423

In 2000, the most 3 important cities regarding the number of pharmaceutical commercial companies were Bucharest with 207 firms, followed by Iasi with 21 firms and Cluj with 20 firms. In 2008, Bucharest remains the leader with 663 firms, on the second place is Cluj with 88 firms, followed by Timisoara with 67 firms. The year 2009 ensures Bucharest an increase with 37 firms, reaching 700 firms. In Cluj the number of companies remains the same, 88 firms, while in Timișoara there is a small decrease, reaching 66 firms by the end of the year. Nine years later, with a growing economy, 30 more firms have developed in Bucharest, reaching 730 firms, in Cluj 7 more appeared, reaching 95 firms and in Timișoara the number of firms was 68.
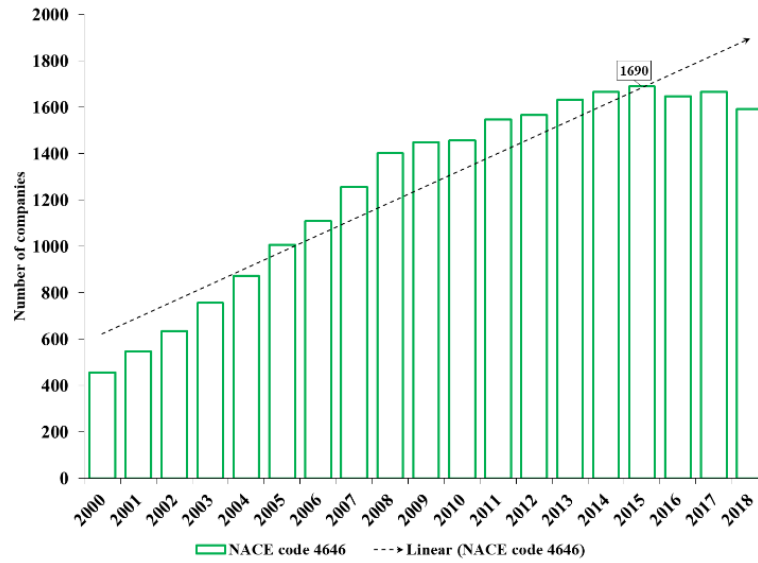
Figure 2. Evolution of the number of companies in
the drug trade sector in Romania for the period 2000-2018
Source: UB/1423

The evolution of the number of companies for the activities in the field of drug trade shows an upward trend in values, but with stagnant values after 2008, as an effect of the economic crisis and with a maximum of values in 2015, summing 1,690 companies.
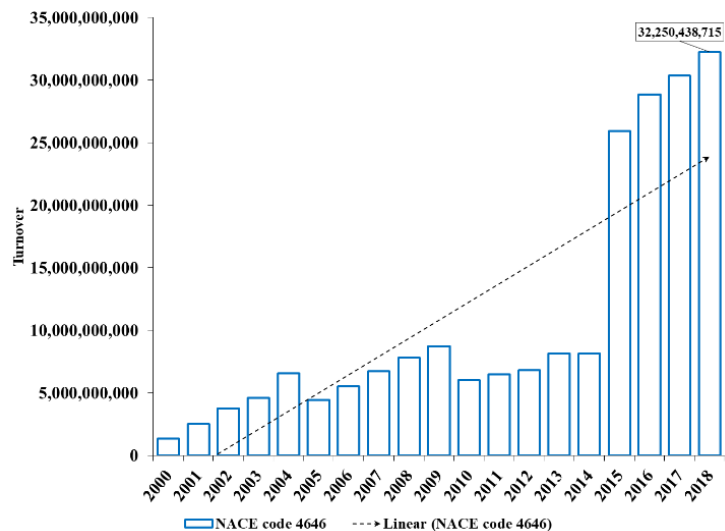
Turnover

2000

2008

2009

2018

Figure 3. Spatial distribution of turnover in the Romanian drug trade sector
Source: UB/1423

The turnover of the pharmaceutical trade companies in 2000 registered Bucharest the first city of the country with 773.3 mil. turnover, followed by Brașov with 142.6 mil. lei and Argeș with 73.4 mil. lei. In 2008, Bucharest leads the cities, followed by Ilfov with 174.8 mil. lei and Buzău with 148.3 mil. lei. For the next year, 2009, the same cities represent

the most important three ones with important increases of the turnover despite the economic crisis that affected the national economy in the previous year. For the last year of reference, 2018, on the other hand, the Bucharest pharmaceutical trade units reached 16.9 bil. lei, followed by Ilfov with 4.2 bil. lei and Argeș with 3.6 bil. lei.

Figure 4. Evolution of the turnover (Lei) in the drug trade sector in Romania for the period 2000-2018
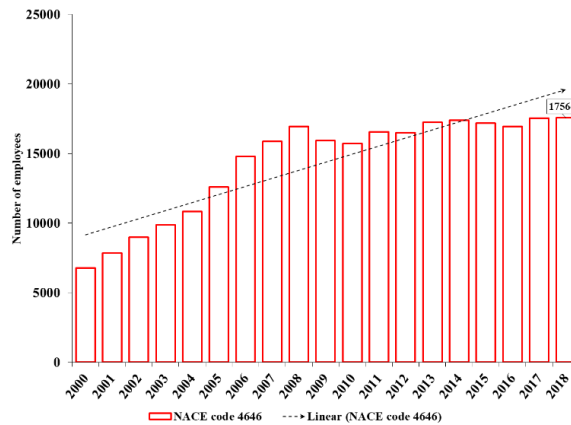Source: UB/1423

The analysis of the evolution of the turnover in the field of drug trade at national level presents an ascending evolution, with significant increases after 2014, respectively 25,943,857,539 lei in 2015, 28,849,923,629 in 2016, 30,362,927,839 lei in 2017 and a maximum value of the analysis period, of 32,250,438,715, in the year 2018.

Number of employees
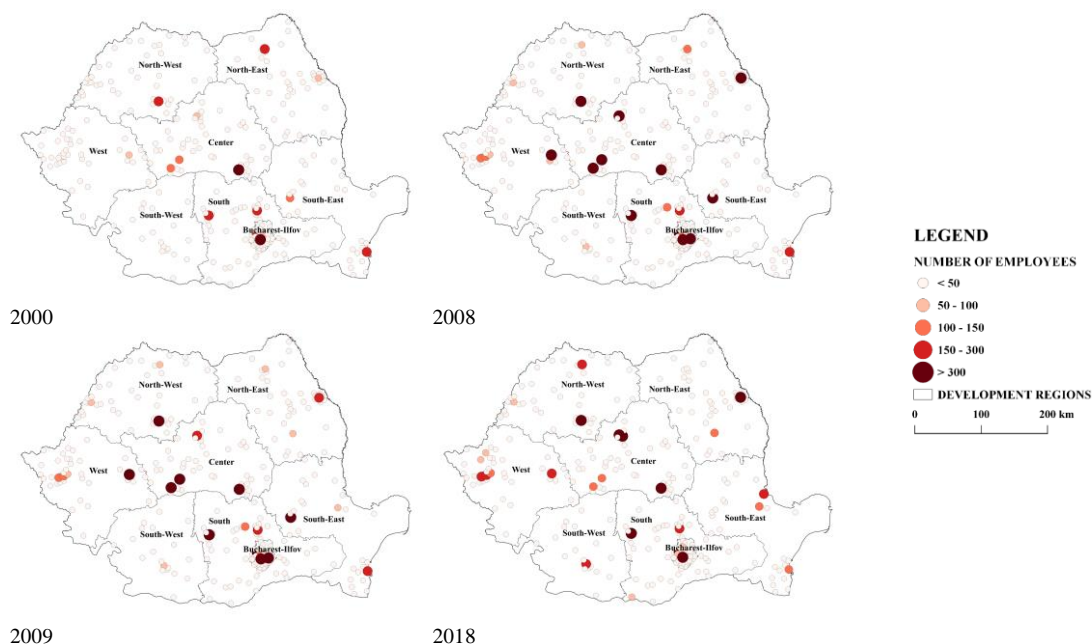
Figure 5. Spatial distribution of the number of employees in the drug trade sector in Romania
Source: UB/1423

Regarding the number of employees, in 2000, the most important cities were Bucharest with 3,400 employees, Brasov with 889 and Cluj with 278 employees. In 2008, Bucharest reached 8,678 employees, followed by Ilfov with 989 employees and Cluj with 796. After one year of crisis, in 2009, the number of employees in Bucharest decreased with 6%, reaching 8,161 employees. On the other hand, in Cluj we can find a significant increase of 41%, reaching 1,125 employees. In 2018, in Bucharest were 9,464 employees in the pharmaceutical commerce field, followed by Ilfov with 1,215 employees and Argeș with 1,026 employees.

Figure 6. The evolution of the number of employees in the drug trade sector in Romania for the period 2000-2018
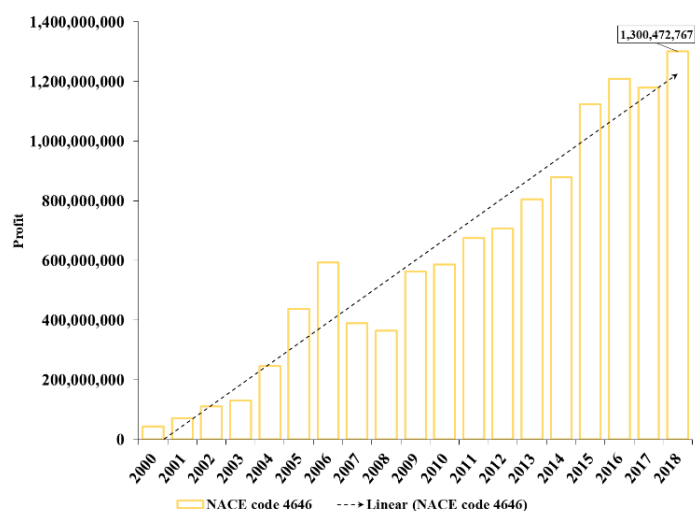
Source: UB/1423

Analyzing the evolution of the number of employees at national level, can observe a positive trajectory with fluctuations after 2008, based on the global economic crisis, with increases and a maximum value reached in 2018, 17,564 employees.

Profit
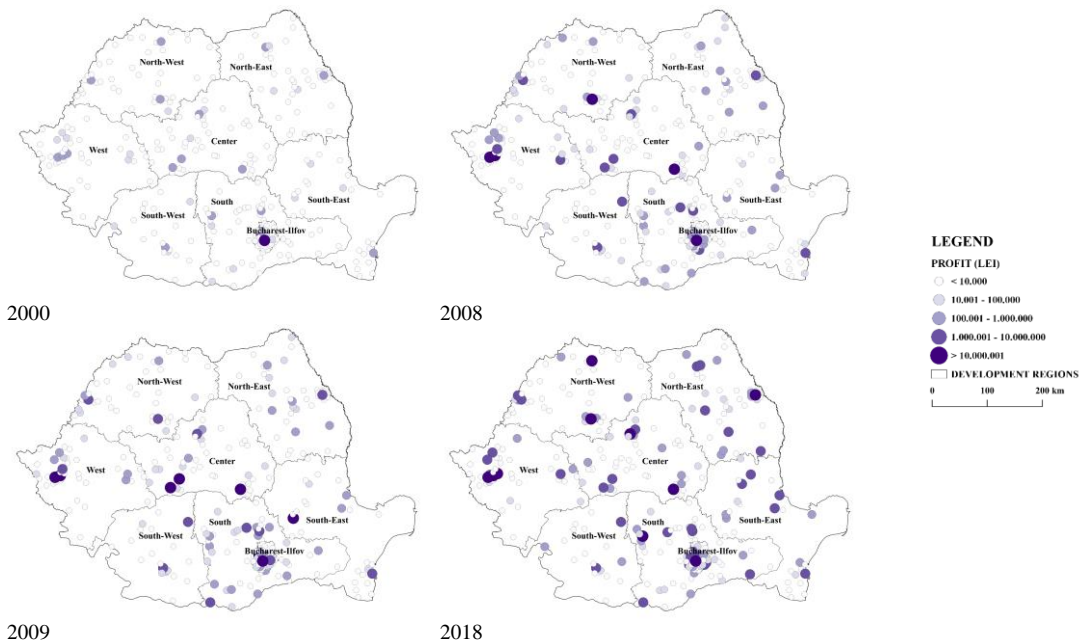
Figure 7. Spatial distribution of profit in the Romanian drug trade sector
Source: UB/1423

Figure 8. Evolution of profit (Lei) in the Romanian drug trade sector for the period 2000-2018
Source: UB/1423

The evolution of the profit in the field of drug trade shows a positive trajectory of values, with a period of decline represented by the years 2007 and 2008 being followed by an upward growth with a maximum value reached in 2018 respectively, 1,300,472,767 lei.

CONCLUSIONS

The period analyzed is characterized by an increase in the number of pharmaceutical commercial units, against the background of an increase in drug use. The aging tendency of the population leads to significant increases in regional profile.

The spectacular increase in the turnover of the drug trade is determined by the increase in consumption, the increase of population incomes and the regional context favorable to the export of drugs.

The dynamics in the regional profile require detailed research regarding the impact on the other components of the territorial systems that have these economic sectors. Research on quantifying the multiplication effects of drug trade on the local economy can be analyzed with a series of algorithms, which have resulted in correlative analyzes of the relationships between the components of a territorial system [14], [15], [16], [17], [18], [19], [20].

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