The synergistic effect of mergers and acquisitions in the pharmaceutical industry

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Abstract:

Aim: The aim of the article is to answer the question what value can be generated in the process of enterprise growth by means of taking over other entities.

Research methods: The research was carried out on the basis of 34 historical transactions on the pharmacy market by one entity in the years 2015-2018, while acquiring a number of pharmacies in Poland. This unique combination will allow us to look at the differences between the market value of the pharmacies purchased and their final purchase price. Additionally, the author is attempting to explain the synergy effects achieved.

Findings: The conducted research also shows that there are no grounds to state that the smaller the entity being purchased, the greater the synergy effect. It is known that small entities have much less capacity to generate economies of scale. On its own a smaller entity has a weaker negotiating position with suppliers. In the case of acquisitions of smaller entities in the transactions described, synergies for the company have been much higher than in the case of pharmacy chains, but this is not the rule. It may be concluded that there is a relationship between the unit price of a pharmacy and the synergy effect. The more expensive a pharmacy is acquired, the smaller the space for profit through synergy.

Originality / value of the article: The market of pharmacies in Poland is characterised by high fragmentation. Out of 14.6 thousand pharmacies in Poland, the largest entity on the market does not exceed 5% of market share . This status quo is the result of strong and unclear regulations which hinder entrepreneurs' operations. For several years, however, strong consolidation tendencies can be seen, which leads to the fact that 56.3% of the market is occupied by pharmacy chains, and 43.7% of the market is comprised of individual pharmacies. The biggest market players try to increase the number of pharmacies mainly through the acquisitions of existing entities.

Implications of the research: The results of the research may be useful for other companies making mergers and acquisitions.

THE SYNERGISTIC EFFECT OF MERGERS AND ACQUISITIONS IN THE PHARMACEUTICAL INDUSTRY

Limitations of the research: The limitation of research is the use of only one industry – pharmacies market. Other limitation is small sample. In future Author will collect the data for deeper and more extended analysis.

1. Introduction

A company can survive and achieve its goals in the long term provided that it develops and grows in a sustainable manner. The development of a company is mainly connected with the introduction of product, process, structural and management innovations. Growth, on the other hand, can be defined as an increase in resources, which enlarges the scale of the company's activity. Such activity often leads to an increase in the value of the enterprise through an expansion of market share and a more diversified operations. For many companies mergers and acquisitions is a quick way to maximize profit and the value of the company (Łopacińska, 2015). On the other hand, some studies suggests that many mergers in Poland were unsuccessful because of poor workforce management and lack of synergy in this area (Ocieszak, 2018). The aim of the article is identification of the added value generated through M&As in the pharmacy sector. The research was carried out on the basis of 34 historical transactions carried out on the pharmacy market by one entity in the years 2015-2018, while acquiring a number of pharmacies in Poland. This unique combination will allow us to look at the differences between the market value of the pharmacies purchased and their final purchase price. Additionally, the author is attempting to explain the synergy effects achieved.

2. Market Value Versus Investment Value

Determining **the value** of an asset is usually necessary while searching for an investor, selling shares or applying for a loan. It is clear that each asset may have a different value for different entities. The literature distinguishes between *fair value* and *fair market value*. *International Accounting Standards* define fair value as "the amount that an entity would receive for selling an asset or paying for transferring a liability in a routine transaction between market participants at the measurement date", (Zarzecki, 2009). What it implies is that the determination of fair value takes into account the characteristics of the item, but does not consider the characteristics of the

purchaser or the transaction (e.g. transaction costs are omitted). This definition assumes that there is an active market for the asset, which in practice is not always the case. Additionally, the market must also meet certain requirements. At the beginning you should identify the primary market which is characterized by the highest number of transactions and the highest activity in relation to a given type of asset. If such a market does not exist, the so-called most advantageous market is used, that is, the market where the object being valued would reach the best price. In order to measure the fair value, market participants, i.e. buyers and sellers, must have the following characteristics:

- be independent of each other,
- have knowledge of how to operate rationally in the market and enter into transactions,
- have the capacity to enter transactions (no legal obstacles, funding provided, the operational capacity to carry out the transaction, etc.),
- be willing to enter into transactions without pressure or coercion.

Even in a relatively homogeneous market, each entity may perceive the value of an asset in a slightly different way due to the fact that there are different uses. The fair value is determined on the basis of a *highest and best use* assumption. This means that the use is "physically possible, legal and financially viable". As with the market, one assumes that the past operations have been optimal unless there are factors proving otherwise. On other occasions, the asset being valued may be combined with other assets (e.g. technology with the distribution network). In that case, the fair value of the asset is calculated assuming that a market participant is able to obtain complementary elements. In the case of the uniqueness of other assets (e.g. a distribution network or other technologies that are not common among market participants), the assumption that transaction costs are negligible may be debatable.

The investment value is determined from the perspective of a specific investor - the user of the valuation. Therefore, it takes into account, in addition to the characteristics of the asset, the characteristics associated with the transaction itself and the investor. Among the main differences between the fair value and investment value one may factor in the following:

- differences in the expectations of future cash flow,
- synergies associated with the ownership of complementary assets (for example, an appropriate distribution network),
- transaction costs associated with the use of the asset by the investor,

- differences in the fiscal position,
- differences in the perception of risk.

When formulating an investment strategy, it is the investment value that is one of the main parameters determining the actions taken.

The intrinsic value (or sometimes fundamental value) is the "true" value of an asset, which takes into account only the key factors associated with the asset. The intrinsic value is not affected by the characteristics of a given transaction or of a given investor and, additionally, the question of the current market price is ignored. The intrinsic value is therefore the value that reflects what the price should be, considering the objectively treated factors (e.g. risk, cash flow expectations, etc.). This is the value that can be found in the reports of stock market analysts for companies listed on the stock exchange markets. Many investors assume that, in the long term, the price trends toward the intrinsic value because of the large number of rational and well-informed market participants.

In the case of an active stock exchange market the market value, is the current price at which an asset can be sold/acquired. However, it is worth noting that sometimes the market for a given asset is incidental. The situation becomes even more complicated when the asset being valued is unique, so there is no market for similar assets. In this case, it is often assumed that the market value coincides with the fair value.

Synergy effects, which are additional benefits gained as a result of merged companies, can be described as incremental profitability or enterprise value creation. Synergy can be achieved in many areas although the most common examples can be observed in operational field (revenues increase or cost savings), finance area (cash flow effectiveness) or through lower taxes payments.

3. Research Hypotheses and Research Methodology

The market of pharmacies in Poland is characterised by high fragmentation. Out of 14.6 thousand pharmacies in Poland, the largest entity on the market does not exceed 5% of market share (IQVIA Report, 09/2018). This status quo is the result of strong and unclear regulations which hinder entrepreneurs' operations. For several years, however, strong consolidation tendencies can be seen, which leads to the fact that 56.3% (IQVIA Report, 05/2018)[1] of the market is occupied by pharmacy chains, and 43.7% of the market is comprised of individual pharmacies.

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[1]pharmacy chain is defined as an entity which owns at least 5 pharmacies.

The biggest market players try to increase the number of pharmacies mainly through the acquisitions of existing entities.h

The article presents research which was conducted on the basis of the data on 34 acquisitions made in 2015-2018 by a single entity, according to the same methodology and in comparable business conditions. The described transactions exceed 300 million PLN and constitute a representative sample for all transactions taking place on the pharmacy market in the described period.

For the purposes of market valuation and investment valuation studies (with the inclusion of the synergy effect), the discounted cash flow method was applied, which in the simplest way can be expressed by the following formula (Damodaran, 2010):

$$DCF = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t},$$ (3.1)

where:

- DCF − present value of cash flows,
- CF_t − the difference between cash inflow and outflow at time t,
- r − discount rate.

The **discounted cash flow** (DCF) valuation method assumes the valuation of the company based on the current value of free cash flow which is expected to be generated by the company in the future (Nita, 2007). Nevertheless, the above formula causes some complication in the estimation of goodwill. Namely, it is impossible to determine the infinite stream of free cash flow. Therefore, the simplest assumption is that CF increases at a rate of g after the forecast period, so the formula takes the following form (Jaki, 2008):

$$DCF = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} + \frac{CF_n(1+g)}{(r-g) \cdot (1+r)^n},$$ (3.2)

where:

- DCF − present value of cash flows,
- CF_t − difference between cash inflow and outflow,
- g − growth rate,
- r − discount rate.

The discount rate should reflect the cost of capital used to generate cash flow. In determining the current value of cash flow generated exclusively for shareholders, an adequate rate of return will be the required rate of return on investment. In the case of inflow, the discount rate should account for both the required rate of return by investors and the costs of foreign capital.

The next step in the valuation is to calculate the company's free cash flow. The FCFF in a given year is calculated as follows (Jajuga, Kuziak and Markowski, 1997):

$$CF = FCFF = NOPAT + Depreciation - CAPEX - NWC\ change, \quad (3.3)$$

where:

- $NOPAT$ - *net operating profit after tax in a given year,*
- $Depreciation$ - *the value of depreciation write-offs in a given year,*
- $CAPEX$ - *capital expenditure for the purchase of fixed assets in a given year,*
- $NWC\ change$ - *change in net working capital in a given year.*

For the proper assessment of a company's income value, the correct determination of the discount rate is of considerable importance. The discount rate takes the form of an interest rate that reflects the time value of money and the risk associated with running an operating activity (K. Jajuga, Kuziak and Markowski, 1997).This rate, called the weighted average cost of capital (WACC), is calculated as a weighted average of the expected cost of debt capital and equity, taking into account the estimated capital structure of the company (Jajuga, Kuziak and Markowski, 1997):

$$WACC = \frac{E}{E+D} \cdot R_e + \frac{D}{E+D} \cdot R_d(1-t), \quad (3.4)$$

where:

- E – *Value of equity,*
- D – *Value of foreign capital,*
- R_e – *Cost of equity,*
- R_d – *Cost of debt,*
- t – *income tax rate.*

The formula of company valuation does not incorporate non-operating assets and real options. In research Author assumed that these are not important factors.

The market and investment valuations used for the further part of the study are presented in Appendix 1. On their basis, three indicators were estimated for each transaction in accordance with the following formulas:

$$Premium_{synergy} = \frac{Investment\ value}{Market\ value} - 1, \qquad (3.5)$$

$$Premium_{synergy\ after\ transaction} \qquad (3.6)$$

$$= \frac{Investment\ value}{Transaction\ amount} - 1,$$

$$Premium_{negotiations} = \frac{Transaction\ amount}{Market\ value} - 1, \qquad (3.7)$$

$$\lambda = \frac{Transaction\ amount - Market\ value}{Investment\ Value - Market\ value}, \qquad (3.8)$$

where:
- *Investment value* – Determined from the perspective of a specific investor. It takes into account the characteristics associated with the transaction itself and the investor(calculated based on DCF valuation);
- *Market value* – The intrinsic value (or sometimes fundamental value) is the "true" value of an asset, which takes into account only the key factors associated with the asset (calculated based on DCF valuation).
- *Transaction amount* – amount of money that was paid to acquire company.

The study raised the following research questions:
- What is the synergy effect and does it depend on the amount of the transaction or the number of pharmacies?
- What is the relation between the estimated market value and the final transaction amount?
- What is the λ coefficient for the presented acquisitions?

4. The Results of the Conducted Research

Table 1 presents indicators for all of the transactions on the pharmacy market carried out by a single entity, using the same valuation parameters described above. In order to present the data clearly, all transactions were referred to the average price of a single pharmacy. When reviewing the indicators for all transactions, it may be noticed that there are some outstanding observations.

Table 1. Indicators for the carried-out transactions

Transaction number	Average price of a single pharmacy	Premium (synergy)	Premium (negotiations)	λ	Synergy premium after transaction
1	960 000	4.17%	2.08%	50.00%	2.04%
2	1 100 000	7.27%	0.00%	0.00%	7.27%
3	1 071 429	103.33%	86.67%	83.87%	8.93%
4	915 000	16.94%	9.29%	54.84%	7.00%
5	1 328 571	5.38%	2.15%	40.00%	3.16%
6	827 273	68.13%	15.38%	22.58%	45.71%
7	964 000	31.95%	4.56%	14.29%	26.19%
8	942 333	27.87%	-16.87%	-60.53%	53.83%
9	1 439 000	26.62%	7.71%	28.98%	17.55%
10	1 060 000	63.14%	11.49%	18.20%	46.32%
11	1 497 333	38.16%	11.31%	29.64%	24.12%
12	715 885	53.09%	7.45%	14.04%	42.47%
13	809 431	169.64%	81.44%	48.01%	48.61%
14	791 484	43.83%	26.34%	60.11%	13.84%
15	1 118 034	-1.55%	-18.01%	1158.32%	20.07%
16	1 070 206	5.81%	-11.05%	-190.19%	18.95%
17	1 382 185	30.89%	26.61%	86.14%	3.38%
18	1 184 587	111.52%	103.60%	92.89%	3.89%
19	431 837	136.07%	116.13%	85.34%	9.23%
20	2 079 060	14.00%	1.01%	7.19%	12.87%
21	1 055 598	-12.07%	-21.85%	181.00%	12.51%
22	665 418	45.02%	25.23%	56.05%	15.80%
23	1 649 275	1.01%	-12.84%	-1271.21%	15.89%
24	1 877 627	4.68%	-21.89%	-467.50%	34.01%
25	1 552 832	3.55%	-3.40%	-95.78%	7.20%
26	146 606	347.50%	309.26%	88.99%	9.34%
27	641 901	73.08%	71.37%	97.66%	1.00%

28	326 389	40.83%	7.23%	17.72%	31.33%
29	486 095	13.91%	-2.28%	-16.41%	16.57%
30	520 971	41.80%	-4.03%	-9.63%	47.75%
31	727 142	19.54%	-17.49%	-89.49%	44.87%
32	414 507	26.63%	20.63%	77.46%	4.97%
33	1 966 601	6.28%	-28.81%	-459.03%	49.29%
34	1 582 461	13.13%	-17.85%	-135.96%	37.71%

Source: Author's own compilation.

It is worth noting that in the set of data there are transactions (e.g. no. 15 and 21) for which the market value is higher than the investment value. Although the synergies and economies of scale result in the buyer being able to make more profit from the same assets, sometimes the seller has a specific cost policy which the buyer does not want to duplicate. In the cases described, this applies specifically to employment policies. Legislation requires pharmacies to have a master's degree chemist in a pharmacy for the entire period when the pharmacy is open, however the practice on the market is, that most pharmacies do not comply with this requirement. Pharmacies often have a Master's degree chemist only for 8 hours a day, and in the remaining hours only a pharmacy technician is available. Especially small networks are able to generate considerable savings in this field, "sharing" the master's degree chemist among several pharmacies in a given city. For obvious reasons, this is a higher level of risk strategy. A large entity, which develops through acquisitions, cannot afford the publicity problems associated with breaking these regulations, especially that, it particularly cares about the safety of patients. In this case, the investment valuation includes both better financial parameters generated by the scale of the organization and higher personnel costs, caused by the adjustment of the existing employment structure to the legal requirements.

Descriptive statistics have been presented in Table 2, showing that the data is asymmetric in distribution, which makes it more justified to use the median to address research hypotheses. The median of the premium resulting from synergy is at the level of 27.25% (16.23% after the transaction), and 50% of observations fall within the range between 6.53% (7.69% after the transaction) and 51.07% (36.79% after the transaction).

Table 2. Descriptive statistics

Descriptive statistics	Average price of a single pharmacy	λ	Premium (negotiations)	Premium (synergy)	Synergy premium after transaction
Average	1 038 267	-11.25%	22.66%	46.50%	21.87%
Median	1 009 799	25.78%	5.90%	27.25%	16.23%
Quantile 25%	718 699	-14.72%	-9.29%	6.53%	7.69%
Quantile 75%	1 368 782	73.13%	24.08%	51.07%	36.79%
Standard deviation	477 176.8	328.7%	62.3%	67.2%	16.9%
Skewness coefficient	35.99%	-52.4%	328.3%	310.6%	57.8%
Kurtosis	-33.83%	1065.9%	1339.6%	1200.4%	-114.5%

Source: Author's own compilation.

After estimating three regression models, it may be concluded that there is only a relationship between the unit price of a pharmacy and the synergy effect, which is consistent with intuition - the more expensive a pharmacy is acquired, the smaller the space for profit through synergy. On the basis of the data, no correlation was found between the amount of the transaction and the synergy effect and the number of pharmacies and the synergy effect. According to this result, it is not legitimate to claim that the purchase of small groups of pharmacies or individual pharmacies may translate into the generation of a greater synergy effect. The estimated linear regression models are also presented in Figures 1-3.

$$SE = \beta 1_0 + \beta 1_1 AP,$$

(4.1)

$$PTSE = \beta 2_0 + \beta 2_1 AP - 1,$$

(4.2)

where:

- SE − synergy effect (the difference between Investment value and market value),
- $PTSE$ − post transaction synergy effect (the difference between Investment value and market value),
- AP − average market price of a single pharmacy.

Table 3. Parameters of model 1 – The relation between the average market price of a pharmacy and the synergy effect

| Parameter	Parameter value	SE	tStat	P-value
$\beta 1_0$	1.1726	0.24828	4.7229	4.44E-05
$\beta 1_1$	-6.81E-07	2.18E-07	-3.1283	0.003733

Source: Author's own compilation.

Table 4. Parameters of model 2 – The relation between transaction amount and the post transaction synergy effect

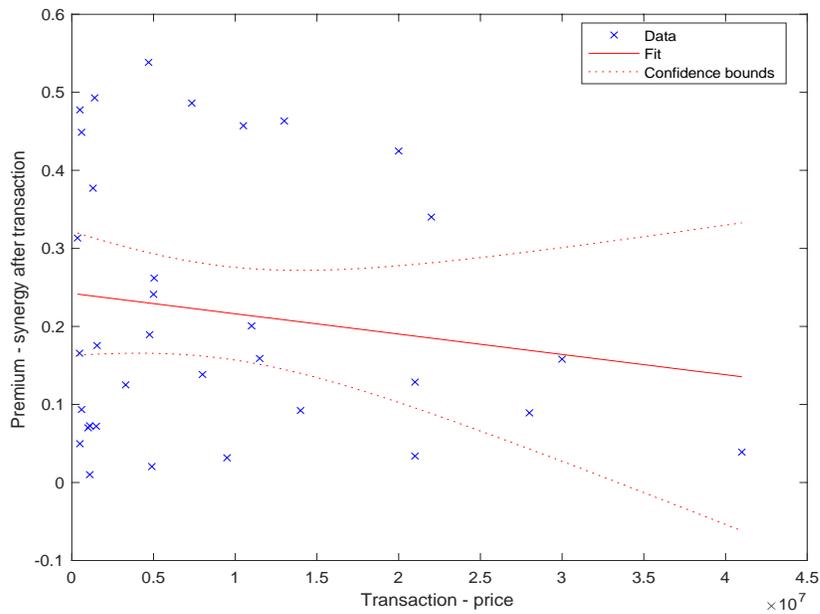| Parameter	Parameter value	SE	tStat	P- value
$\beta 2_0$	0.21954	0.040231	5.4569	5.256e-06
$\beta 2_1$	-0.00011082	0.0037622	-0.029456	0.97668

Source: Author's own compilation.

Figure 1. The relation between the average market price of a pharmacy and the synergy effect
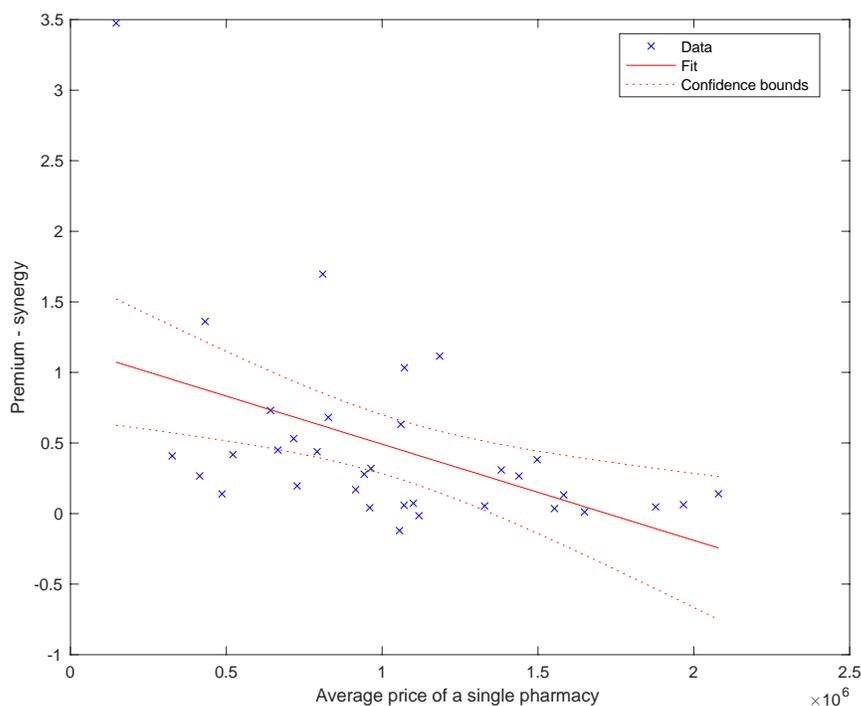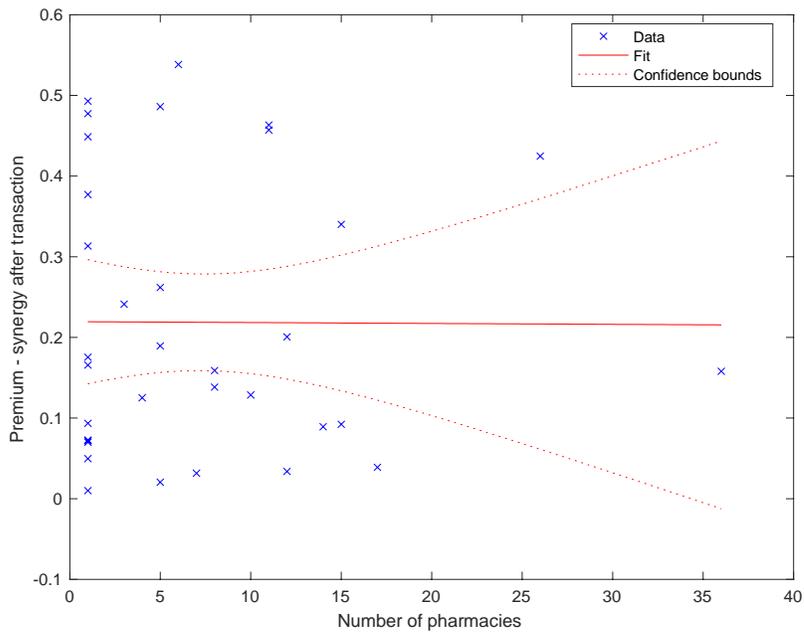

Source: Author's own compilation.

Figure 2. The relation between a transaction amount and the synergy effect

Source: Author's own compilation

Figure 3. The relation between the number of pharmacies and the synergy effect

Source: Author's own compilation.

Figures 1-3 show final results. The conducted research shows that there are no grounds to state that the smaller the entity being purchased, the greater the synergy effect. It is known that small entities have much less capacity to generate economies of scale. On its own a smaller entity has a weaker negotiating position with suppliers. In the case of acquisitions of smaller entities in the transactions described, synergies for the company have been much higher than in the case of pharmacy chains, but this is not the rule.

5. Summary

The presented research offers an estimation of the premium resulting from synergy in the pharmacy sector. The median of the synergy premium is 27.25% (16.23% after the transaction) and 50% of the observations are between 6.53% (7.69% after the transaction) and 51.07% (36.79% after the transaction). These results may serve as a point of reference for other transactions.
The aim was achieved - Author identified the added value generated through M&As in the pharmacy sector. It is also worth mentioning that the entities acquired are usually family businesses which are the heritage of their owners' lives, hence, in addition to the value of the business itself, there is a large emotional element that must be satisfied in order for the transaction to take place. In addition, many sellers agree to sell the business which they have built over years but on condition that they will obtain the means to continue to function without the forfeit profits.

Larger entities running several pharmacies have been benefiting from some of the synergy effects on their scale (greater control over suppliers, lower administrative costs), which means that the acquirer has less synergy effects at the moment of acquisition, which has been confirmed in research. At the same time, it is worth noting that for the buyer, a greater number of pharmacies in the acquired entity, despite lower synergy effects, is of great importance for the speed of network development. It is easier to buy one hundred pharmacies in ten transactions (ten pharmacies each) rather than one hundred pharmacies in individual transactions.

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Appendix no. 1. – Data Used in the Research

Table 6. Basic source data on the transactions.

Transaction no.	Year of acquisition	Number of pharmacies	Market value	Investment Value	Transaction
1	2018	5	4 800 000	5 000 000	4 900 000
2	2018	1	1 100 000	1 180 000	1 100 000
3	2018	14	15 000 000	30 500 000	28 000 000
4	2018	1	915 000	1 070 000	1 000 000
5	2017	7	9 300 000	9 800 000	9 500 000
6	2017	11	9 100 000	15 300 000	10 500 000
7	2017	5	4 820 000	6 360 000	5 040 000
8	2017	6	5 654 000	7 230 000	4 700 000
9	2017	1	1 439 000	1 822 000	1 550 000
10	2017	11	11 660 000	19 022 000	13 000 000
11	2017	3	4 492 000	6 206 000	5 000 000
12	2017	26	18 613 000	28 494 000	20 000 000
13	2017	5	4 047 154	10 912 778	7 343 000

14	2016	8	6 331 876	9 107 027	8 000 000
15	2016	12	13 416 406	13 207 793	11 000 000
16	2016	5	5 351 030	5 661 783	4 760 000
17	2018	12	16 586 221	21 710 448	21 000 000
18	2018	17	20 137 974	42 596 183	41 000 000
19	2018	15	6 477 550	15 291 860	14 000 000
20	2018	10	20 790 601	23 702 250	21 000 000
21	2015	4	4 222 392	3 712 781	3 300 000
22	2015	36	23 955 048	34 739 768	30 000 000
23	2015	8	13 194 200	13 327 474	11 500 000
24	2015	15	28 164 406	29 483 006	22 000 000
25	2015	1	1 552 832	1 607 990	1 500 000
26	2017	1	146 606	656 068	600 000
27	2017	1	641 901	1 111 000	1 100 000
28	2017	1	326 389	459 660	350 000
29	2017	1	486 095	553 699	475 000
30	2017	1	520 971	738 734	500 000
31	2017	1	727 142	869 214	600 000
32	2017	1	414 507	524 872	500 000
33	2017	1	1 966 601	2 090 035	1 400 000
34	2017	1	1 582 461	1 790 221	1 300 000

Source: Author's own compilation