

Analysis of the Medical Companies Operating in the Polish Capital Market

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Abstract

Purpose: The aim of the paper is to analyse the activity of medical companies operating in the Polish capital market through the analysis of their investment attractiveness. Two measures taking into account two different perspectives were used for efficiency evaluation: financial-internal (EVA) and external-market (TSR).

Design/methodology/approach: Two measures of evaluation of financial and market results of medical companies were used to achieve the aim of the paper. These two measures take into account two different perspectives: financial-internal (EVA) and external-market (TSR). Economic value added (EVA) is based on a preconception that maximisation of the value of an enterprise is the best possible way to increase competitiveness. The second formula, Total Shareholder Return (TSR), measures shareholder value creation in the most direct way: not only shareholders' value but also their wealth.

The second part of the paper focuses on the characteristics of the private medical sector in terms of the family influence on the functioning of the selected companies. The Substantial Family Influence indicator proposed by S. Klein was used, which determines the level of ownership and the involvement of the family in the researched companies.

Findings: The analysis of the results of the examined group of medical companies, using two different measures from two different perspectives, shows different results. Hence, it is difficult to determine which of the examined companies is an attractive investment – a reliable source of income from investment. The second part of the paper identifies the listed medical companies in terms of their family nature. The SFI index was used, in which the participation of family members in management boards and supervisory boards was additionally taken into account. The calculations allowed for identifying four family

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businesses, one of which, Enel-Med, may be specified as a company with a significant family impact. The EVA measure was used for comparison of the financial results obtained by the companies, dividing them into family and non-family enterprises; however, no differences have been observed between the groups. The findings obtained do not confirm that family businesses achieve better financial results.

Research limitations/implications: The private medical market is going to develop and may be attractive from the point of view of investors not only for patients. Globalisation of the market, emergence of big businesses and, the need to consolidate the sector make it necessary for the Polish medical companies to search for external sources of financing and to enter the stock market. Hence the question whether investing in capital medical companies is profitable. The paper looked for the answer by conducting research on 19 companies and their financial results from 2016 and 2017. Two measures were used, taking into account two different perspectives: financial-internal (EVA) and external-market (TSR). The results obtained were different, so it is difficult to determine which of the examined companies is an attractive investment – a reliable source of income from investment. In light of this, it is worth considering whether the analysis carried out in the long term or with the use of other indicators would give more unambiguous results.

Originality/value: The aim of the paper is to analyse the activity of medical companies operating in the Polish capital market through the analysis of their investment attractiveness, which is a new approach in the assessment of the operation of the private medical sector.

Also, the analysis of the private medical sector, taking into account the influence of the family and using the SFI indicator on the functioning of individual companies, is an original approach.

Keywords: medical sector, medical companies, family enterprises, private medical sector, investment attractiveness assessments.

JEL: I13, G3, H2

Analiza spółek medycznych działających na polskim rynku kapitałowym

Streszczenie

Cel: analiza działalności spółek medycznych działających na polskim rynku kapitałowym poprzez analizę ich atrakcyjności inwestycyjnej. Do oceny efektywności wykorzystano dwa mierniki uwzględniające dwie różne perspektywy: wewnętrzną, finansową (EVA) i zewnętrzną, rynkową (TSR).

Metodologia: wykorzystano dwie miary oceny wyników finansowych i rynkowych firm medycznych. Wskaźniki uwzględniają dwie różne perspektywy: wewnętrzną, finansową (EVA), która opiera się na założeniu, że maksymalizacja wartości przedsiębiorstwa jest najlepszym sposobem na zwiększenie konkurencyjności oraz zewnętrzną, rynkową (TSR), która mierzy tworzenie wartości dodanej dla akcjonariuszy w najbardziej bezpośredni sposób: nie tylko wartość dla akcjonariuszy, lecz także ich bogactwo. W drugiej części opracowania skupiono się na charakterystyce prywatnego sektora medycznego, uwzględniając wpływ rodziny na funkcjonowanie przedsiębiorstw. W tym celu wykorzystano zaproponowany przez S. Kleina wskaźnik SFI (Substantial Family Influence), który określa poziom własności i zaangażowania rodziny w badanych firmach.

Wyniki: analiza wyników badanej grupy przedsiębiorstw medycznych pokazuje zróżnicowane wyniki. Trudno jest zatem określić, która z badanych firm jest atrakcyjną inwestycją, a zatem wiarygodnym źródłem dochodu z inwestycji. W drugiej części opracowania zidentyfikowano rodzinne spółki medyczne notowane na giełdzie papierów wartościowych, biorąc wpływ rodziny na ich funkcjonowanie. Zastosowano indeks SFI, w którym dodatkowo uwzględniono udział członków rodzin w zarządach i radach nadzorczych. Obliczenia pozwoliły na zidentyfikowanie czterech firm rodzinnych, z których jedna, Enel-Med,

może być określona jako firma o znaczącym wpływie na rodzinę. Następnie wykorzystano wskaźnik EVA do porównania wyników finansowych uzyskanych przez spółki, dzieląc je na przedsiębiorstwa rodzinne i nierodzinne. Nie zaobserwowano jednak istotnych różnic pomiędzy tymi grupami. Uzyskane wyniki nie potwierdzają zatem, że przedsiębiorstwa rodzinne osiągają lepsze wyniki finansowe.

Ograniczenia/implikacje badawcze: w artykule poszukiwano odpowiedzi na pytanie, czy inwestowanie w kapitałowe spółki medyczne jest opłacalne? W tym celu przeprowadzono badanie 19 spółek usług medycznych, analizując ich wyniki finansowe za lata 2016–2017. Zastosowano dwa mierniki, uwzględniające dwie różne perspektywy: wewnętrzną (EVA) i zewnętrzną (TSR). Uzyskane wyniki były niejednoznaczne, zatem nie otrzymano jednoznacznej odpowiedzi na pytanie która, z badanych firm jest atrakcyjną inwestycją. W związku z tym warto zastanowić się, czy analiza przeprowadzona w dłuższej perspektywie czasowej czy też z wykorzystaniem innych wskaźników dawałaby bardziej klarowne wyniki.

Oryginalność/wartość: celem artykułu była analiza działalności spółek medycznych działających na polskim rynku kapitałowym poprzez ocenę ich atrakcyjności inwestycyjnej, co jest nowym podejściem w analizie funkcjonowania prywatnego sektora medycznego. Wartość artykułu podnosi analiza prywatnego sektora medycznego uwzględniająca wpływ rodziny na funkcjonowanie poszczególnych spółek i zastosowanie wskaźnika SFI.

Słowa kluczowe: sektor usług medycznych, przedsiębiorstwa z prywatnego sektora medycznego, przedsiębiorstwa rodzinne, oceny atrakcyjności inwestycyjnej przedsiębiorstw.

1. Introduction

A number of solutions – not always successful – have been implemented in order to improve healthcare in Poland. They were aimed at improving the condition of the market and the status of healthcare providers. One of these solutions was an opportunity to commercialise and privatise medical services in Poland (introduced by the Act of April 15, 2011 on medical activity). The development of a private sector in healthcare is of particular importance from the point of view of patients, provides them with an opportunity for unlimited access to healthcare and allows for improving the quality of the services provided, thanks to – among others – a competitive offer. In Poland, a subscription to a private healthcare institution is still the basic form of accessing private healthcare. Consequently, ca 3 million persons have additional health insurance (a 14% increase compared with 2017). They are the clients of companies such as: Grupa Lux Med (the biggest of those providers, serving over 1 million customers), Medicover (over 660k subscribers) or Enel-Med (over 500k) and a few smaller companies. This private market of medical services is currently worth ca PLN 3 billion a year, still low compared with the state market (nearly PLN 10 billion). However, market experts estimate that until 2020 the market will be growing at around 20% a year, which makes it one of the fastest growing sectors of medical industry (Rabij, 2016; Golonko et al., 2018).

Investors consider the private medical market interesting due to its development and the fact that the medical sector exists in the capital market

proves that such companies may be interesting for investors. OncoArendi, a company supported by Michał Sołow (one of the biggest Polish stock market investors, holding considerable share in Synthos, Cersanit, Echo Investment, Barlinek), is an interesting example – 4 years ago it bought and transferred to Poland the rights to research on the non-steroid product for asthma treatment conducted at Yale University (Karniszewski, 2018).

Another topic of the article is the characteristics of the private medical sector in terms of the family influence on the functioning of the selected companies. The best example of such a company is one of the biggest family businesses in this sector, Enel-Med. The company, established by Anna and Adam Rozwadowski in the 1990s, expanded into the network of 19 outpatient clinics and two hospitals in Warsaw, as well as 1250 partner institutions. The sons joined the company and in 2018, they took over from the founders and introduced third generation into the business. The example of Enel-Med may suggest that the specific qualities of the family businesses affect their success and may generate better financial results. Thus, in the further part of the paper, financial results of medical enterprises have been analysed through a comparison of the results of family and non-family businesses.

The aim of the paper is to analyse the activity of medical companies operating in the Polish capital market through the analysis of their investment attractiveness. So formulated an aim is a new approach in the assessment of the operation of the private medical sector.

The following research hypotheses have been formulated to achieve the aim of the paper:

- H1: Financial and market results of medical companies affect the attractiveness of stock investments in this type of companies.
- H2: Financial results of family medical businesses are better than those of non-family entities.

2. Characteristics of the Medical Sector and the Research Sample

The medical sector is a very specific, yet very significant, part of market economy. One of the unique features of medical services is the diversity of factors – apart from the health care activity itself – affecting the health condition. Thus, the effect of the operation of the sector is hard to measure in value categories, it is also not possible for the recipients of medical services to precisely establish their future – and sometimes even present – needs in the same area. The outlays on and effects of medical services are often expressed in different units, which makes it impossible to compare them. There is also asymmetry of information between the recipients and providers of the services. (Rój & Sobiech, 2006; Bukowska-Piestryńska, 2010).

Conducting business operations in the medical sector is associated with many difficulties and limitations on the one hand and with a constant, insatiable and growing demand for such services on the other hand. The problems arise mainly from the imperfect legal solutions, legal regulations (e.g. the requirement to enter the activity into various registers, aimed at assessment of the quality of the performed actions) (Lipowski, 2017), or problems with financing such activity.

In order to expand the possibility of financing and to boost the effectiveness of functioning of the medical sector, attempts are being made to reform it. The literature on the subject proves that nearly all countries are taking efforts in order to reform their healthcare systems (although with different levels of determination and to a different extent) (Klich, 2012). In 2011, in Poland, new legal solutions were implemented in terms of conducting medical activity. The law introduced made it possible to create and operate medical business activity in the form of capital companies, which is an opportunity for such type of activity due to a wider access to new sources of funding, other than grants or subsidies. Medical services are characterised by a steady and undisturbed trend of growing demand. The growing demand means the increase in spending on health, shaped by many factors: demographic (a growing number of elderly people, ageing society), economic (an increase in household income results in an increase in private spending on health and an increase in the patient's own contributions), social (growing awareness of the need to take care of own health) and many others.

Hence, the paper will attempt a financial and market analysis of the Polish medical companies operating in the joint stock market. Currently, there are 23 enterprises listed on the Warsaw Stock Exchange which may be considered to belong to the medical sector, including 4 foreign companies. Only the Polish capital companies have been selected for the study. These include the companies manufacturing and selling medical equipment and materials (ADV, AWM, BRA, MDG, MRC, VOX), manufacturing medications (BML, BIO, CLN, KRK, MAB, CRM), distributing medications (NEU), biotechnological (NNG, OAT, BKM, SLV, SNT), as well as hospitals and outpatient clinics (ENE). The diversity of activities of the surveyed enterprises does not affect the results and conclusions drawn at the final stage of the research. The main aim was to evaluate the financial and market results of the companies operating in the Polish capital market. Table 1 presents the characteristics of the examined companies as of 17.12.2018.

Medical companies compared in the table are characterised by significant diversity in terms of share price, resulting from the issue price. In the case of the analysed entities, the share prices of only three companies were on the rise as of 17.12.2018, the share prices of most of the other companies were falling or remained at the same level.

The list of medical companies listed on the Warsaw Stock Exchange	Name abbreviation	Share price	Price change
Adiuvo Investments Spółka Akcyjna	ADV	9.00	0.00%
Airway Medix Spółka Akcyjna	AWM	0.69	+1.47%
Biomed-Lublin Wytwórnia Surowic i Szczepionek Spółka Akcyjna	BML	0.92	-2.13%
Bioton Spółka Akcyjna	BIO	5.43	-1.63%
Braster Spółka Akcyjna	BRA	2.32	+7.91%
Celon Pharma Spółka Akcyjna	CLN	32.40	+1.25%
Centrum Medyczne Enel-Med Spółka Akcyjna	ENE	10.50	0.00%
Mabion Spółka Akcyjna	MAB	89.70	-0.22%
Master Pharm Spółka Akcyjna	MPH	5.94	-2.62%
Medicalgorithmics Spółka Akcyjna	MDG	25.80	0,00%
Mercator Medical Spółka Akcyjna	MRC	11.35	-0.44%
Nanogroup Spółka Akcyjna	NNG	2.40	-14.29%
Neuca Spółka Akcyjna	NEU	239.00	-2.45%
Oncoarendi Therapeutics Spółka Akcyjna	OAT	17.57	-0.06%
Polski Bank Komórek Macierzystych Spółka Akcyjna	BKM	57.40	-0.69%
PZ Cormay Spółka Akcyjna	CRM	1.17	-6.40%
Selvita Spółka Akcyjna	SLV	50.00	-3.85%
Synektik Spółka Akcyjna	SNT	9.18	0.00%
Voxel Spółka Akcyjna	VOX	24.40	0.00%

Tab. 1. The examined medical companies in the present market situation. Source: <https://www.gpw.pl/spolki> access 17.12.2018.

3. Methodology of the Study

Two measures of evaluation of financial and market results of medical companies were used to achieve the aim of the paper – two measures taking into account two different perspectives: financial-internal (EVA) and external-market (TSR).

Economic value added (EVA) is based on a preconception that maximisation of the value of an enterprise is the best possible solution increasing competitiveness. It is a reliable method of evaluating the results of an economic unit. A strive for maximising the shareholder's wealth should be the

responsibility of the management. According to the creators of this measure, it is a single precise indicator of operational effectiveness of an enterprise. Thus, the economic value added may be defined as a measure describing an increase or decrease in the value of an enterprise in a given period, caused by the realisation of the basic operational activity of an enterprise.

$$EVA = ADJUSTED OPERATING PROFIT(1 - T) - WACC \times \\ \times ADJUSTED INVESTED CAPITAL$$

$$EVA(adjust) = NOPAT(adjust) - WACC \times K(adjust)$$

where:

NOPAT = EBIT (Earnings Before Deducting Interest and Taxes) \times (1 - T) – operating profit after tax, whose Polish equivalent in the light of Accounting Act is operating profit \times (1 - T);

T (tax) – income tax rate,

NOPAT (adjust) (Net Operating Profit After Tax) = adjusted operating profit – operating profit adjusted for changes in the balance of adjustments,

K (adjust) – adjusted invested capital – invested capital adjusted for changes in the balance of adjustments,

WACC (Weighted Average Cost of Capital) – weighted average cost of equity and borrowed capital.

The basis for generating additional value when calculating EVA is NOPAT (Net Operating Profit After Taxes), whereas EVA is the recorded difference, still constituting a certain category of profit. The literature worldwide usually specifies it as a residual profit (income) or economic profit. In its simplest form, it is a conventional operational accounting profit after tax reduced not only by the cost of external sources of financing, but also by the cost of equity (Cwynar & Cwynar, 2002). Invested capital was defined as interest-bearing capital, i.e. the capital associated with cost, i.e. the sum of: equity, long-term interest-bearing liabilities, short-term interest-bearing liabilities.

The adjustments of profit and invested capital used in the calculation of value added are presented in Table 2.

EVA is the surplus value (added value) which is created on an investment. EVA also defines the cost of capital as a weighted average of the costs of different financing method used to finance the investment (Sutherland & Canwell, 2004). Thus, EVA is the surplus revenue from the core business over the average weighted capital cost. $WACC\% \times K$ formula is called capital charge. It provides information on the possibility to increase or decrease the owners' wealth, thus EVA (Pasionek, 2014):

– EVA > 0 provides information on the multiplication of the capital of the owners by the enterprise in a given period,

- EVA < 0 destroys this value of the owners,
- EVA = 0 means that the enterprise reaches the break-even point where the revenue covers all costs, including all costs incurred in raising capital.

Content	Invested capital	Operational profit after tax
Research and development expenditure should not be regarded as costs over a given period, but as investments	Increased by the part of R&D investments that has not been written off as costs	Adjusted by the change in the status of these R&D investments from the end and beginning of the year
Reserve for the deferred income tax	Increased by the reserve for the deferred income tax	Adjusted by the difference in value of this reserve at the beginning and end of year.
LIFO reserve will occur at such manner of inventory valuation and equals the difference between FIFO and LIFO valuation.	Increased by the amount of LIFO reserve	Adjusted by the difference in value of this reserve at the beginning and end of the period
Other reserves	Increased by the amount of reserve	Adjusted by the difference in value of this reserve at the beginning and end of the period
Contingent liabilities	Increased by the value of liabilities	No adjustments

Tab. 2. Adjustments taken into account in calculating the economic values added. Source: Own studies based on: Waśniewski, Skoczylas (2002).

The second measure used in the assessment of medical joint-stock companies on the Warsaw Stock Exchange is the market measure – Total Shareholder Return (TSR). The TSR measurement according to individual data is as follows (Skoczylas & Niemiec, 2007):

$$TSR = \frac{(P_1 - P_0) + DPS}{P_0}$$

where:

P1 – market price of the company's share at the end of the period,
P0 – market price of the company's share at the beginning of the period,
DPS – dividend per share payment.

TSR measure does not take into account the cost of equity, thus surplus total return for shareholders, i.e. SPREAD TSR, should be measured. SPREAD (TSR) formula is presented as follows: (Skoczylas & Niemiec, 2007):

$$SPREAD (TSR) = TSR - CoE$$

where:

CoE – cost of equity

Achieving a surplus total return for shareholders (SPREAD (TSR)) does not yet constitute a sufficient basis for evaluation of the attractiveness of investing in the shares of the examined company. A correct analysis should consist in comparing the actual total return for shareholders with the rate of return calculated for the sector in which the company operates, or even for the market as a whole. A positive difference between the positive overall actual and sectoral rate of return indicates an above-average rate of return and higher profitability than the average in the sector. A positive value lower than expected and lower than sectoral means a negative situation, whereas a negative value means a very unfavourable situation. (Skoczylas & Niemiec, 2007).

4. Analysis of the Financial and Market Results in the Examined Sample of Capital Medical Companies

In this case, the specific feature of capital companies, i.e. their presence on the capital market, was used when analysing the financial (accrual based on financial statements) and market results. The evaluation of perceiving the operations of medical companies in terms of the evaluation of investment attractiveness is a novelty in such a type of business activity as the medical sector.

The calculation of the economic value added and the total return for the shareholders required, at the very beginning, the calculation of the cost of equity, which constitutes a component of the weighted average cost of capital (WACC). WACC constitutes an important component of the EVA formula.

Calculation of the cost of equity for Audio Investment	2016	2017
Risk-free rate*	1.33%	1.54%
Risk premium**	6.16%	6.06%
Beta Audio Investment***	0.2113	0.064
Cost of equity according to CAPM model	3.1%	2.34%

* risk-free rate – calculated based on the interest rate of treasury bills (the interest rate was weighted by the value of transactions carried out in the audited periods)

** risk premium – following A. Damodaran (http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html)

*** Beta – beta indicator measures the behaviour of the share price of the selected company in relation to the behaviour of the entire market; it has been calculated individually for each company, using the stock price development in relation to WIG (Warsaw Stock Exchange Index) in the reviewed periods.

Tab. 3. Calculation of the cost of equity according to CAPM model for an example medical company Audio Investment. Source: Own studies based on: Byrka-Kita (2008)

To calculate the cost of debt, the adopted general assumption (covering all companies), the interest rate of 3M WIBOR from a given year was increased by a 2% commission from the bank. Moreover, when measuring the effective cost of debt financing, the benefits from the “tax shield” were taken into account, since interest paid on debt is a tax-deductible cost, which allows for a reduction in income tax expenditure. Table 4 presents calculations of foreign capital in the reviewed period.

Year	WIBOR (%)	Credit costs (in %) = WIBOR 3M+2%	Cost of debt adjusted with tax shield (1 - T)
2016-3M	1.73	3.73	3.02
2017-3M	1.72	3.72	3.01

Tab. 4. Calculation of debt adopted in the calculations. Source: Own studies based on data obtained from <https://wibor.money.pl/>, access: 17.12.2018.

The cost of debt constitutes a component of WACC. For the purpose of the survey, the average weighed cost of equity was calculated by the sum of two ratios: the ratio of the share of equity in invested capital and the cost of equity and the ratio of the share of debt capital in invested capital and the cost of debt capital.

Calculations were made taking into account the previous assumptions and using the previously presented formulas. The results are presented in Table 5.

The results presented in Table 5 reflect the financial situation in terms of capital market. In the measurement of the metrics, Beta coefficient was used – its value equalling one means that if the market rises by 1%, the price of a given share will increase by the same amount and vice versa – the price of the company’s shares will fall by the same amount as the market falls. The value exceeding one means that the price of the company’s shares will rise more than the market, but the fall in the market will result in a much bigger decrease in the price of the company shares. The value lower than one, but more than zero, means that the share price rises slower than the market; the value equalling zero denotes risk-free instruments. The value lower than one means that the share price acts contrary to the whole market – if the market rises, the share price falls, when the market falls, the share price increases.

Most companies from the study group obtained Beta value in the (0–1) range. This means that the prices of shares of the examined companies rise slower than the whole market. The only company whose share price rose faster than the market in 2016 was BLA. In 2017, more companies obtained negative Beta. The value of Beta affected the value of the cost of equity. In 2017, the capital market valued medical companies lower than in 2016.

Name abbreviation	BETA		Cost of equity (in %)		TSR		SPREAD TSR	
	2016	2017	2016	2017	2016	2017	2016	2017
ADV	0.21	0.064	2.63	1.93	0.11	-0.48	-0.83	-1.43
AWM	0.24	-0.000	7.56	1.54	0.35	-0.59	-0.56	-1.05
BML	1.23	0.470	8.91	4.37	-0.40	0.28	-0.91	-0.53
BIO	0.83	0.670	6.44	5.61	-0.31	-0.57	-1.09	-1.37
BRA	1.00	0.910	7.47	7.06	0.37	-0.82	-0.37	-1.61
CLN	0.58	0.420	4.90	4.09	0.10	0.05	-0.88	-0.95
ENE	0.32	-0.240	3.28	0.06	0.05	0.22	-0.66	-0.44
MAB	0.49	0.570	4.37	4.98	0.63	0.49	-0.37	0.26
MPH	0.56	-0.140	4.76	0.69	0.01	-0.57	-0.98	-1.54
MDG	0.58	0.320	4.92	3.51	0.45	-0.36	-0.33	-1.06
MRC	0.22	0.210	2.68	2.80	0.15	-0.11	-0.45	-0.77
NNG	Lack data	-15.200	Lack data	-90.57	Lack data	-0.29	Lack data	-1.28
NEU	0.32	0.050	3.31	1.87	0.09	-0.32	-0.70	-1.19
OAT	0.02	0.100	1.47	2.16	1.78	-0.17	0.78	-1.17
BKM	0.40	0.180	3.77	2.64	0.03	0.27	-0.81	-0.56
CRM	0.08	0.040	1.83	1.76	-0.05	-0.27	-1.05	-1.26
SLV	0.58	0.740	4.90	6.02	0.47	1.03	-0.38	0.13
SNT	0.04	-0.150	1.60	0.58	-0.12	0.03	-0.75	-0.94
VOX	0.45	-0.012	4.09	1.47	-0.07	-0.10	-0.90	-0.85

Tab. 5. Financial and market results of the examined medical companies. Source: Own studies based on data obtained from www.gpw.pl, access: 17.12.2018.

The level of Total Shareholder Return (TSR) is similar to Beta. In 2016, thirteen out of nineteen companies obtained a positive level of return, whereas in 2017 there were only seven such companies. In the first surveyed year, only one company (OAT) obtained a positive spread, whereas in 2017 there were two such companies (SLV and MAB). The market situation of the examined group of medical companies is not satisfactory for the shareholders. In both audited years, none of the companies achieved a positive return on shares, namely the return which the investors would be satisfied with. The following table presents the financial results of the examined group of medical companies, evaluated with the economic value added in 2016–2017.

Name abbreviation	EVA (in thousands PLN)		EVA interpretation	
	2016	2017	2016	2017
ADV	-20195.53	-46187.00	N	N
AWM	-5059.00	3358.80	N	P
BML	-34592.40	1502.40	N	P
BIO	-151798.00	16243.40	N	P
BRA	-18417.00	-29256.00	N	N
CLN	-34011.00	-20537.00	N	N
ENE	-59283.00	1212.16	N	P
MAB	-59283.00	-46936.00	N	N
MPH	34201.00	8108.00	P	P
MDG	20359.70	33829.20	P	P
MRC	6548.94	-5167.80	P	N
NNG	-2025.85	12424.10	N	P
NEU	15533.51	54211.97	P	P
OAT	-3647.10	-4113.25	N	N
BKM	1757.30	13430.50	P	P
CRM	-6633.40	-18931.00	N	N
SLV	-62213.40	215011.00	N	P
SNT	-370.40	3408.80	N	P
VOX	1075.50	9044.10	P	P

N – negative financial situation

P – positive financial situation

Tab. 6. Economic value added of the examined listed medical companies. Source: Own studies based on data obtained from www.gpw.pl, access: 17.12.2018.

Economic value added is a measure presenting the internal effectiveness of the company based on the financial data obtained from the financial statement of the enterprise, taking into account the cost of all types of capital acquired by the enterprise. A positive value of this measure is evaluated positively, as it provides information on an increase in the owners' wealth. A negative value indicates the value which the owners' property was decreased by. In 2016, only six enterprises generated additional value for the shareholders, whereas in 2017 the number rose for twelve companies. The situation is positive in both audited periods only in four companies (BKM, NEU, MDG, MPH).

The analysis of the results of the examined group of medical companies with two different measures, from two different perspectives – financial-internal (EVA) and external-market (TSR), is extremely different. Based on those results, it is hard to recommend one of the examined companies as a certain source of profit on investment.

5. Family vs. Non-Family Medical Companies – Analysis

Family business is the most frequently encountered ownership business model in the world and its impact on the global economy is considered significant. It is estimated that family firms generate over 70% of global GDP. In the European Union, the share of family enterprises varies, depending on the country and scope of definition, from 45% to 90%, and such companies generate between 45% and 65% of the national income (Astrachan & Shanker, 2003).

Family businesses fall within the category of micro, small and medium enterprises (SMEs) globally whether in the USA, Europe, Asia or Africa. However, some family businesses are large multinational corporations that operate in many countries. And this category of family companies, in which the ownership and supervision over their business activity is in the hands of one family, is gaining in importance. A large number of international surveys confirm that a significant number of entities have one or several shareholders who are mostly family members. Research by La Porta (1999) indicated that 30% of global companies are controlled by a family, while in Western Europe the dominant form of ownership is family property (Faccio & Lang 2002).

Family businesses are associated with dual roles where family members serve as owners and managers of the enterprise. Family businesses are affected by high sensitivity to uncertainty and risk attitudes which induce the owners to avoid decisions affecting the firm's survival and control of the business. Family businesses at the initial stages are often characterised by informal organisational structures, owner manager with or without employees. The results of many studies show the impact of family businesses on the economy, such as family businesses showing higher profitability in the long run, paying a significant amount of taxes and having a more focussed strategy (Thomsen & Podersen, 2000; Cucculelli & Marchionne, 2012).

The presence of family businesses is also observed in the Polish market, both among large enterprises and listed companies from the medical sector. Changes in the market and the presence of global companies force the Polish companies to adapt, both in the area of sharing power and ownership with external investors and in the search for external sources of financing. In Poland, the surge of consolidation of the medical services private sector in 2010–2013 actually forced one of the bigger companies – run by the Rozwadowski family

– a network of outpatient clinics, Enel-Med, to enter the stock market. In 2011, this allowed for acquiring PLN 35.5 million for development, simultaneously keeping the majority shareholding in family hands (Dębek, 2014; Strawiński, 2018). Currently, Enel-Med is the third biggest company in the private medical market, however the biggest company with family capital. Since the company went public, it has doubled the valuation of shares and increased its profits by 17% compared with 2017 (Strawiński, 2018).

Based on the example of Enel-Med, referring to the words of the family themselves, it may be stated that the specificity of family business: sustainability, stability, family organisational culture and human resources are all factors that contribute to the success of the company. Thus, it seems interesting to carry out such a comparison based on the other stock market companies from the medical sector and assess whether the family nature of the entity affects the financial results (Strawiński, 2018).

Despite the important role of family entrepreneurship in the global economy, there are still serious problems with defining family firms. Family business may be distinguished based on different criteria, such as: family structure of the entity's ownership, strategic control exercised by a family, participation of family members in management and the involvement of more than one generation in running the business (Handler, 1989).

Most researchers tend to consider a family business as a unit where two or more family members share work and property. Family domination in the ownership can take different forms depending on the share in assets: over 50% of shares in small and medium-sized entities, but only 20% or even 10% in the case of large enterprises. The European Commission specifies that a listed company is considered family-owned if the person who created it or acquired its shares owns at least 25% of the voting rights granted on the basis of the shares held (Surdej & Wach, 2010).

One of the solutions to the lack of a clear definition of a family business is the use of the Substantial Family Influence indicator proposed by S. Klein. It is a measure that determines the level of ownership and the involvement of the family (Klein, 2000). Therefore, the synthetic SFI has the following form:

$$SFI \cong \left(\frac{EQ_{Fam}}{EQ_{Total}} \right) + \left(\frac{SB_{Fam}}{SB_{Total}} \right) + \left(\frac{MB_{Fam}}{MB_{Total}} \right) \geq 1$$

where:

EQ_{Fam} – is a family participation in ownership/Equity

EQ_{Total} – is total company equity of a given company

SB_{Fam} – is the number of family members in the supervisory board

MB_{Fam} – is the number of family members in the management board

Based on the existing definitions of family businesses, the authors used the following definition, formulated for the purpose of this article, in order

to examine family versus non-family entities listed on the Warsaw Stock Exchange: A family enterprise is one in which at least one family member participates in the management of and/or supervision over the company and family members own at least 25% of the assets of the company.

To determine the family ownership of and control over the analysed entities, the SFI index was calculated, in which the participation of family members in management boards and supervisory boards was additionally taken into account. The results are presented in Table 7.

Company name (name abbreviation)	Family	Family percentage share of the ownership	Family percentage share of the ownership (votes) in the General Meeting of Shareholders	Supervisory Board	Management Board	SFI >1
Biomed Lublin (BML)	Sierocki	0.15	0.23	0.00	0.14	0.37
Celon Pharma (CLN)	Wieczorek	0.67	0.75	0.40	0.33	1.48
Enel-Med. (ENE)	Rozwadowscy	0.65	0.65	0.20	0.67	1.52
Master Pharm S.A. (MPH)	Farnasik	0.65	0.65	0.20	0.50	1.35
Mercator Medical SA (MRC)	Żyznowski	0.62	0.72	0.20	0.25	1.17
Neuca SA (NEU)	Herba	0.52	0.52	0.33	0.00	0.85
Selvita SA (SLV)	Przewięźlikowski	0.31	0.42	0.00	0.14	0.56
Synektik SA (SNT)	Koznecki	0.25	0.25	0.00	0.50	0.75

Tab. 7. Characteristics of the studied group using the SFI index. Source: Own studies based on GWP data, access: 17.12.2018.

Table 7 presents the characteristics of ownership and family control in 8 stock market medical companies out of 19 analysed herein. Pursuant to SFI coefficient presented above, it may be stated that four of them (CLN, ENE, MPH i MRC) are family businesses, whereas the family influence is significant in the case of Enel-Med.

The next table presents the overview of the financial results of the family and non-family medical companies (Table 8).

Name abbreviation	EVA interpretation	
	2016	2017
ADV	N	N
AWM	N	P
BML	N	P
BIO	N	P
BRA	N	N
CLN	N	N
ENE	N	P
MAB	N	N
MPH	P	P
MDG	P	P
MRC	P	N
NNG	N	P
NEU	P	P
OAT	N	N
BKM	P	P
CRM	N	N
SLV	N	P
SNT	N	P
VOX	P	P

N – negative financial situation

P – positive financial situation

Tab. 8. Overview of the economic value added of the examined family vs. non-family stock market companies. Source: Own studies based on data obtained from www.gpw.pl, access: 17.12.2018.

The comparison of interpretations concerning the economic added value of family and non-family companies in the medical sector listed on the Warsaw Stock Exchange does not indicate any differences. There is only one family business among those generating added value for the stockholders in both research periods (BKM, NEU, MDG, MPH). The internal effectiveness of two of the remaining companies is better in one of the years and worse in the other, whereas in the case of one company, Celon Pharma (CLN), both results are negative. Thus, similarly to the case of the whole group of the examined stock market medical companies, most of them generate additional value for the shareholders, however only for one year.

6. Final Conclusions

The private medical market is going to develop thanks to the increase in salaries and consumption, as well as the changing awareness of Poles. The public medical sector remains underfinanced and inconvenient to use for the patient. The private medical market, however, may be attractive not only from the point of view of the service user, but investor as well. Globalisation of the market, emergence of big businesses, the need to consolidate the sector make it necessary for the Polish medical companies to search for external sources of financing and to enter the stock market. Hence the question whether investing in capital medical companies is profitable.

The paper presents the analysis of the financial and market results of the Polish medical companies operating in the capital market. 19 companies have been selected for the study, including: companies manufacturing and selling medical equipment and materials (ADV, AWM, BRA, MDG, MRC, VOX), manufacturing medications (BML, BIO, CLN, KRK, MAB, CRM), distributing medications (NEU), biotechnological (NNG, OAT, BKM, SLV, SNT), as well as hospitals and outpatient clinics (ENE). Two measures taking into account two different perspectives: financial-internal (EVA) and external-market (TSR) were used for efficiency evaluation.

In the evaluation of the Total Shareholder Return (TSR) for 2016, thirteen out of nineteen companies reached a positive level of this return (68%), with only seven companies (37%) in 2017. The analysis indicated, in the internal effectiveness evaluation based on financial data (EVA), that in 2016 only six companies generated additional value for shareholders (32%), whereas in 2017 there were twelve such companies (63%). The analysis of the results of the examined group of medical companies, with two different measures from two different perspectives, shows different results. Hence, it is difficult to determine which of the examined companies is an attractive investment – a reliable source of income from investment. The hypothesis presented in the introduction to the study has been verified negatively.

The final part of the paper identifies the listed medical companies in terms of their family nature. The SFI index was used, in which the participation of family members in the management boards and supervisory boards was additionally taken into account. The calculations allowed for identifying four family businesses, one of which, Enel-Med, may be specified as a company with a significant family impact. EVA measure was used for comparison of the financial results obtained by the companies, dividing them into family and non-family enterprises, however no differences have been observed between the groups. The results obtained do not confirm the family businesses accomplishing better financial results. Their success is mainly associated with the aspects connected to management or specific organisational culture, thus soft resource factors which are difficult to measure.

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