Acta Sci. Pol.
Oeconomia 16 (1) 2017, 93–100
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-4602 DOI: 10.22630/ASPE.2017.16.1.10

ORIGINAL PAPER

Received: 28.11.2016
Accepted: 24.01.2017

EVALUATION OF FUNDAMENTAL STRENGTH OF FOOD COMPANIES ON THE WARSAW STOCK EXCHANGE

Waldemar Tarczyński✉, Małgorzata Tarczyńska-Łuniewska

University of Szczecin

ABSTRACT

The article presents the proposal to apply the (universal) method of assessing the fundamental strength of a company with an example of the Polish food sector. The proposed method belongs to the group of methods of multidimensional comparative analysis and is applicable to the directly immeasurable categories (economic and financial standing, fundamental strength). The problem to be solved is the method of measuring the fundamental strength (attractiveness) of a company. The aim of the paper is to assess the fundamental strength of the food companies in Poland and to identify areas of use the results of research in practical analyses. The article describes how to construct such a measure and how to use it practically. The empirical example included data of food firms listed on the Warsaw Stock Exchange over years 2010–2014. The article presents method for assessing the investment attractiveness of enterprises comprising the food sector in terms of their fundamental strength, namely the long-term investment in their shares.

Key words: food sector, fundamental strength of companies, fundamental power index

INTRODUCTION

Analyses and evaluation of companies may be carried out at various levels of market aggregation and using different methods. The selection of a method or method of carrying out analyses is related to the applied range of results. This problem is well reflected in the literature [Porter 1980, Bednarski 1989, Waśniewski and Skoczylas 1994, 2004, Batóg 1997, Zarzecki 1997, Gruszczyński 2002, Siemińska 2002, Tarczyński 2002, Zaleska 2002, Sierpińska i in. 2004, Tarczyński et al. 2005].

The financial analysis or more thorough fundamental analysis is one of the best known and classical methods applicable in analysis and company's evaluation. Both financial analysis and fundamental analysis facilitate the assessment of an economic entity from their area of activity perspective. At the same time quantitative and qualitative factors modelling economic and financial picture of an analysed entity are considered. According to the classical approach, such methods do not allow for evaluation of an entity by means of one aggregated value. In turn, such opportunity provides application of the non-classical approach, using the concept of fundamental strength of a company and fundamental power index to measure it. Non-classical approach requires application of taxonomic methods for such measurement. The first proposal to measure fundamental power was *TMAI* (Taxonomic Measure of Investment Attractiveness) developed by Tarczyński in 1994 [Tarczyński 1994]. The concept of measure of attractiveness evolved [Tarczyński 2002, Mikołajewicz 2010, Tarczyńska-Łuniewska 2013a] and became basis for developing the concept of metodology and methods for fundamental power meas-

✉wtarc@wneiz.pl

urement [Tarczyńska-Łuniewska 2013b]. This value is considered a multidimensional category, which presents results of company's operation in the economic reality. It is created as a result of processes within a company in various area of its activity. Fundamental strength encompasses a set of fundamental factors (quantitative and qualitative), what is also reflected in fundamental power index (*FPI*). The concept of the fundamental strength means that a company is "good", doing well in market conditions, is competitive and has good economic and financial condition. Structure of the index is strictly based on fundamental power methodology and leads to its quantification, as the result. Fundamental strength is measured by *FPI* value. Application of such a measure is interesting from the practical point of view. We may refer to several application areas in this respect, e.g.:

- in long-term, fundamental investment process – where, horizontal and vertical risk diversification is applied, including development of databases for portfolio analysis;
- application of the index (indices) of synthetic analysis and market evaluation at different levels of aggregation, from the market review researches point of view, e.g. determination of development level, analysis of capability;
- to assess a development level of entities (companies) included in market components or its aggregate (e.g. a sector).

Due to extensive scope of applications of fundamental strength, this article proposes limitation of research area to food sector on the Warsaw Stock Exchange (WSE). This sector is one of the most present and operates on the market for the longest period of time. It is considered to be the most stable sector but having a great impact on economic development. The aim of this article is application of the universal method of assessment of the fundamental strength of Polish food companies in practical analysis and sector evaluation as well as determination of areas to apply gathered results. Such an approach allows for answering the following question: What is the fundamental strength of companies composing the food sector? Are there any deviations in this respect? How fundamental strength of food sector itself can be described? How information about the fundamental strength can be used in the investment process? In the empirical example data of food sector companies listed on the Warsaw Stock Exchange over the period 2010–2014 were used. The article presents methods of investment attractiveness of food companies in terms of their fundamental strength, namely the long-term nature of investment in shares of these companies.

FOOD SECTOR IN POLAND

Food sector is considered the key sector for economy and industrial production. It is important from macroeconomic perspective and Polish economy point of view. According to data from the Statistical Office, food sector represents approximately 12.5% of GDP. This sector generated 19.9% of value of sold products, out of which 16.7% was food production, and 3.2% beverages.

Food sector in Poland can be defined as one of more flexible in terms of adaptability to market fluctuations. Observation of changes in this respect allows for statement that this sector did well over political transformation. On the other hand the activity of economic entities in the sector can be assessed as stable. The sector is responsible for supply with regard to food production. Supply corresponds to demand, while the risk to cease production within this area is low, and in case of some products one can make a hypothesis that it does not exist. Both sector and market is described as positively influencing the economic development. In turn, the sector competitiveness is identified with technical, technological or organizational development with regard to food production and sales. In principle, development within these areas influences the increase of competitiveness of entities operating in food sector. Flexibility of companies in this respect and possibility to implement changes to increase competitiveness of a company on the market is also important. Implementations within technical, technological or organisational fields force the companies to commit high value of funds for investments, improvements or innovations. Accession to the European Union in 2004 has significantly facilitate such activities through involvement of European funds.

Food sector covers the wide area of activities and is quite diversified in terms of structure. It is at least visible while analysing its structure according to the Polish Classification of Economic Activities (PCEA). Following the PCEA, this sector is classified under C section. This section includes manufacturers of beverages and food products (www.stat.gov.pl). It is worth to accentuate that legislation determining food quality standards is a crucial element of sector's operation. It is related to the manufacturing process of food products and beverages and their effect on health.

According to the Agricultural Market Agency (www.arr.gov.pl), the Ministry of Agriculture and Rural Development (www.mr.gov.pl) or Polish Information and Foreign Investments Agency (www.paiz.gov.pl) food industry in Poland was quite successful over the economic crisis and has optimistic development projections. Moreover, Poland is among leading food exporters within the European Union. Development of food sector should be also related to the potential of ecological food production and considering Polish food as the "healthy" one. The implemented program for Polish food brand, supported by number of promotion activities on Polish and foreign markets is also of important value. The importance of food sector for economy is mentioned in several publications in this field [Obiedziński et al. 2003, Firlej 2008, Beba and Poczta 2014, Gliwa 2015].

Strong competition exists both among food manufacturers and within trading of products area. Therefore intense consolidation processes between enterprises and food manufacturers are being noticed on the market or in the industry. Unions of food manufacturers are very common, small shops enter into franchising of trade networks or make attempts to specialize production and trading of specific group of products. All these elements aim at competitiveness of parties joining such unions and facilitate operation on the market. Following the accession to the European Union a number of food companies in Poland decreased by approximately 3,500. The main reason for such a situation might be the strong competition that followed borders' opening, inflow of cheap products from abroad, restrictive European regulations imposed on food produced and implementation of Russian embargo on Polish food products in 2014.

Specificity of food products makes this sector treated as matured and stable in terms of market functions. Changes in economic condition of consumers do not have sudden impact on the market and do not entail significant changes in this respect.

MATERIAL AND METHODS

The main goal of this elaboration is evaluation of the fundamental strength of food companies listed on the Warsaw Stock Exchange over the period 2010–2014. This is important in practical analysis and sector's evaluation as well as in determination of application areas for obtained study results. Moreover, the assessment of fundamental strength of food sector on the stock exchange is important because it allows answering the following questions: what is a development level of this sector? What is the level of fundamental strength of entities composing this sector? Are there any changes and/or differences in this respect? What is the importance of the fundamental strength to the investment process?

Comparing some information coming from the stock exchange to that from beyond the stock exchange, full picture of situation relating to food market appears.

Subject to analysis were companies from the Main Market of the Warsaw Stock Exchange. The studies covered period from 2010 through 2014. Annual data from financial reports of entities under study were used in analysis of fundamental strength of companies, including analysis of financial situation. The following, selected financial indices were factors of the fundamental strength: current ratio, liabilities rotation (days), receivables rotation in days, ROA, ROE, debt ratio. Analysis was carried out in two steps:

- The primary database of food companies including information about selected factors of fundamental strength was determined;

- The following indicators were determined out of the primary database: Dynamic Fundamental Power Indices, fundamentally stable (*WSF*) – the approach including stability of factors over time was used in building the index. *WSF* was built using the scoring method.

The other, generally available information concerning food sector/market in Poland was used in studies as well. There were data from Central Statistical Office of Poland, Ministry of Agriculture and Rural Development, Polish Information and Foreign Investments Agency.

The formal construction of the Fundamental Power Index – *WSF* (the full procedure is presented in [Tarczyńska-Łuniewska 2013b]) is determined under the following formulas:

$$WSF_{SF} = w_1 \cdot MSF_{SF} + w_2 \cdot JSF_{SF} \tag{1}$$

$$w_1 = \frac{n_{MSF}}{N} \qquad w_2 = \frac{n_{JSF}}{N} \tag{2}$$

$$w_1 + w_2 = 1 \tag{3}$$

where: WSF_{SF} – fundamental power index determined under databases of companies stable over time in terms of the fundamental strength, individual approach to factors;
MSF_{SF} – stable measure of the fundamental strength determined through one of the selected methods of linear ordering or scoring; the measure is calculated based on quantitative database of companies fundamentally stable over time, irrespective of applied method,
JSF_{SF} – stable measure of qualitative factors determined to quantify the area considered as qualitative, in which case the measure is calculated based on the same database of companies fundamentally stable over time, but is related to qualitative factors;
w_1, w_2 – weights for quantitative and qualitative measures, determined so as their sum is equal to one and individual value is non-negative;
n_{MSF} – number of quantitative fundamental factors;
n_{JSF} – number of qualitative fundamental factors;
N – number of all fundamental factors.

Dynamic fundamental power index, fundamentally stable, has been applied in this study, considering only quantitative factors, which may be presented as follows:

$$WSD_d = \sum_{t=1}^{T} v_t \cdot MSF_t$$
$$v_t = \frac{nc_{it}}{N}, \qquad \sum_{t=1}^{n} v_t = 1, \qquad v_t \geq 0 \tag{4}$$

for $i = 1, 2, \ldots, k$; $t = 1, 2, \ldots, n$;

where: v_t – weight for i-factor over t-period;
nc_{it} – number (sequence) of i-quantitative factor over the period t;
N – number of sequence of i-factors over the studied period ($t = 1, 2, \ldots, n$);
k – number of all fundamental factors;
MSF_t – measure of fundamental power over t period (sum of all scores for all factors according to Table 1).

Table 1 includes scores allocated to economic and financial indices used in the study. Most of them have general standards, commonly adopted or sector standards. For all companies subject to analysis scores can be also determined under statistical analysis of economic and financial indices. In terms of fundamental strength and development prospects over long-term investment the higher is *WSF* level the company is better.

Table 1 shows that a given company may reach maximum 36 scores. Table 2 presents assigned levels of the company's fundamental strength.

Table 3 shows *WSF* values determined according to the formula (4) for food companies listed on the Warsaw Stock Exchange over the period 2010–2014.

Table 3 shows that the fundamental strength of food companies listed on the Warsaw Stock Exchange over 2010–2014 is high. The best company is Kruszwica (21.53) and the weakest is Wilbo (6.87), what gives a difference of 213%. According to adopted classification (Table 2), the best company is at average level of the fundamental strength. The level of obtained measures may be referred to maximum (36) or simple statistical tools

Table 1. Scores allocated to the selected economic and financial indices

Index	Standard values	Scores	Max number of points
Current ratio	<1.2; 2>	below 1.2 – 0 pts <1.2 to 1.4) – 3 pts <1.4 to 1.6) – 4 pts <1.6 to 2) – 6 pts over 2–4 pts	6
Liabilities rotation in days	<30; 60> (days)	below 30 – 6 pts <30 to 40) – 4 pts <40 to 50) – 3 pts <50 to 60) – 2 pts over 60–4 pts	6
Receivables rotation in days	<30; 60> (days)	below 30 – 6 pts <30 to 40) – 4 pts <40 to 50) – 3 pts <50 to 60) – 2 pts over 60–4 pts	6
ROA	0	<0 to 0.2) – 2 pts <0.2 to 0.4) – 4 pts over 0.4–4 pts	6
ROE	0	<0 to 0.2) – 2 pts <0.2 to 0.4) – 4 pts over 0.4–4 pts	6
Debt ratio	<0.5; 0.9>	below 0.5 – 6 pts <0.51 to 0.6> – 5 pts <0.61 to 0.7> – 4 pts <0.71 to 0.8) – 3 pts <0.81 to 0.9> – 1 pts over 0.9–4 pts	6

Source: Own elaboration based on Tarczyńska-Łuniewska [2013].

Table 2. Level of the company's fundamental strength

Max 36		*SF* level
36.00	27.00	high
27.00	18.00	mean
18.00	9.00	low
9.00	0.00	very low

Source: Own elaboration.

Table 3. *WSF* and assessment of the fundamental strength of companies under studies

Company	$WSF_{2010/2014}$	*SF* level
KRUSZWICA	21.53	mean
DUDA	18.07	mean
PEPEES	16.93	low
WAWEL	14.93	low
INDYKPOL	14.87	low
GRAAL	13.80	low
SEKO	13.07	low
INVFRICA	12.80	low
MAKARONY	10.87	low
PAMAPOL	10.47	low
ZYWIEC	9.27	low
MIESZKO	8.73	very low
WILBO	6.87	very low

Source: Own calculation.

can be applied. Based on these, obtained results can be evaluated. Table 4 presents basic measures of descriptive statistics: arithmetic mean, standard deviation and coefficient of random variation.

Table 4. Basic statistical measures for *FPI* over 2010–2014

Statistical measure	Value
Arithmetic mean	13.25
Standard deviation – $S(x)$	4.10
Coefficient of random variation – V_s	31.00

Source: Own calculation.

Based on Table 4 the detailed internal analysis of fundamental strength may be carried out. The most simple are two methods. According to the first method companies that have fundamental strength over arithmetic mean are worth to invest in on the stock exchange. Theseare: Kruszwica, Duda, Pepees, Wawel, Indykpol and Graal for the period 2010–2014. According to the second method companies are divided into three groups: these worth investing, with the index value above arithmetic mean increased by standard deviation, these which are not worth investing over the long period of time and those placed between these ranges. And therefore the first, investor-attractive group includes: Kruszwica and Duda, and the third group, subject to thorough analysis includes: Mieszko and Wilbo. This approach is in line with the assessment suggested in Table 2. Thus companies recognized as attractive and featuring fundamental strength at the mean level are much more risky than those with the same recommendation but with high *SF* value (Table 2).

The suggested approach can be also employed to evaluate the market situation in the sector in terms of the whole capital market. The observation of changes in stock indices over time for the best companies (WIG20) and the sectoral index is the easiest method which supports better assessment of fundamental strength measured with *WSF* index. Primarily it allows for better evaluation of a risk relating to investment in food companies with recommendation of the mean fundamental strength. Figure represents these stock indices at the Warsaw Stock Exchange over the period 2010–2016.

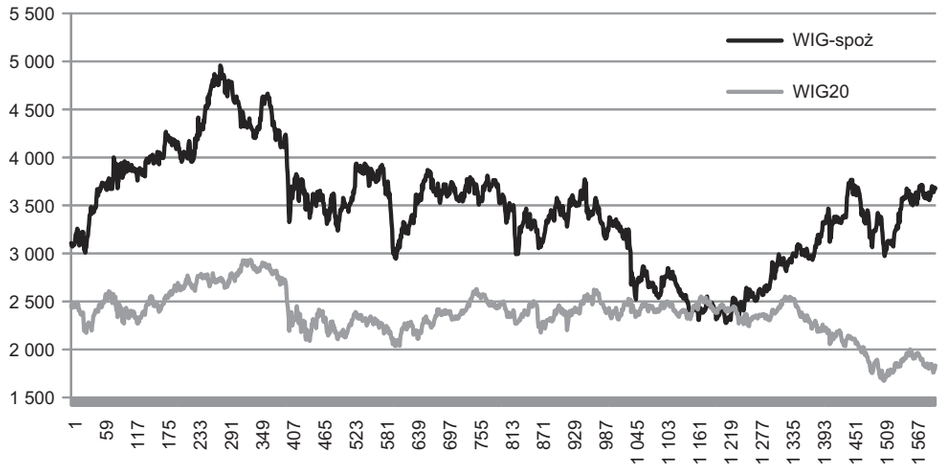

Fig. WIG20 and WIG-spożywczy (WIG-spoż) over the period 2010–2016

Source: Own elaboration.

Data analysis of Figure shows a positive trend for food sector over the recent three years (since 2014). Index of the best companies (WIG20) explicitly decreases while the value of food sector index clearly increases. Making evaluation of the situation in the sector and on the stock exchange, one may find that investment in food companies with high fundamental strength is very profitable, because compared to the whole capital market the risk is lower and there are better development trends.

CONCLUSION

The article presents the proposal to apply fundamental strength index (*WSF*) to evaluate the fundamental strength of food companies listed on the Warsaw Stock Exchange. The suggested measure is an element of the multidimensional comparative analysis and it facilitates valuation of a category which is directly immeasurable (economic and financial situation and fundamental strength), and depends on a great number of measurable and non-measurable factors. Studies on food companies on Polish capital market over the period 2010–2014 allow for verification of usability of proposed approach and on the other hand to evaluate attractiveness of investment in food companies on the Warsaw Stock Exchange over the long-term investment, following *WSF* index. Studies proved that simple statistical tools can be applied to the in-depth analysis and to limit the investment risk. This approach can be also used in inter-sector comparison, portfolio analysis and enhancement of key elements of the fundamental analysis before valuation of internal value of a stock. Based on the generally available data, in simple terms the proposed method allow for verification the economic and financial situation of a company, irrespective of the common or specialized evaluation and analyses. The strength of this method is objectiveness and possibility to make dynamic analysis including longer period of time, what allows for current monitoring of the fundamental strength of a company. Received results encourage to further studies in development of the company's fundamental strength evaluation system that will allow to reduce the investment risk on the capital market.

REFERENCES

Batóg, J. (1997). Propozycja klasyfikacji firm według sytuacji ekonomiczno-finansowej. Taksonomia, 4, 68–79.

Beba, P., Poczta, W., 2014. Rozwój i rola polskiego przemysłu spożywczego w warunkach akcesji do Unii Europejskiej. Polityki Europejskie, Finanse i Marketing, 11 (60), 7–18.

Bednarski, L. 1989. Analiza finansowa w przedsiębiorstwie przemysłowym. PWE, Warszawa.

Gruszczyński, M. (2002). Kondycja finansowa przedsiębiorstw. Prognozy ekonometryczne. [In:] D. Zarzecki (Ed.). Zarządzanie Finansami: klasyczne zasady – nowoczesne narzędzia. Wyd. US, Szczecin.

Firlej, K. (2008). Rozwój przemysłu rolno-spożywczego w sektorze agrobiznesu i jego determinanty. Wydawnictwo Uniwersytetu Ekonomicznego w Krakowie, Kraków.

Gliwa, E. (2015). Wpływ zmian restrukturyzacyjnych na rozwoj sektora rolno-spożywczego w Polsce. Progress in Economic Sciences, 2, 239–248.

Mikołajewicz, G. (2010). Siła fundamentalna przedsiębiorstwa i czynniki ją kształtujące. Ujęcie modelowe (rozprawa doktorska). UE w Poznaniu, Poznań. Retrieved from http://www.wbc.poznan.pl/Content/161923/S4225GrzegorzMiko%C5%82ajewicz.pdf.

Obiedziński, M., Kujawa, J. (2003). Sektor spożywczy i handel artykułami spożywczymi. Dostosowanie MSP do wymogów Unii Europejskiej: poradnik przedsiębiorcy. ARP, Warszawa.

Porter, M.E. (1980). Competitive Strategy. Techniques for Analyzing Industries and Competitors. The Free Press, A Division of Mcmillan Inc, Washington.

Siemińska, E. (2002). Metody pomiaru i oceny kondycji finansowej przedsiębiorstwa. TNOiK, Toruń.

Sierpińska, M., Jachna, T. (2004). Ocena przedsiębiorstwa według standardów światowych. PWN, Warszawa.

Tarczyński, W. (1994). Taksonomiczna miara atrakcyjności inwestycji w papiery wartościowe. Przegląd Statystyczny, 3, 275–300.

Tarczyński, W. (2002). Fundamentalny portfel papierów wartościowych. PWE, Warszawa.
Tarczyński, W., Łuniewska, M. (2005). Multidimensional Comparative Analysis Methods as an Alternative to Classical Portfolio Analysis. Folia Oeconomica Stetinensia, 3–4 (11–12), 29–42.
Tarczyńska-Łuniewska, M. (2013a). Definition and nature of fundamental strengths. Actual Problems of Economics, 2, 1, 15–23.
Tarczyńska-Łuniewska, M. (2013b). Metodologia oceny siły fundamentalnej spółek (giełdowych i pozagiełdowych). ZAPOL, Szczecin.
Waśniewski, T., Skoczylas, W. (1994). Syntetyczna ocena wyników oraz sytuacji finansowej przedsiębiorstwa. Rachunkowość, 4.
Waśniewski, T., Skoczylas, W. (2004). Teoria i praktyka analizy finansowej w przedsiębiorstwie. FRR, Warszawa
Zaleska, M. (2002). Ocena ekonomiczno-finansowa przedsiębiorstwa przez analityka bankowego. Oficyna Wydawnicza, Warszawa.
Zarzecki, D. (1997). Wykorzystanie wskaźników finansowych w ocenie przedsiębiorstwa. Ekonomika i Organizacja Przedsiębiorstwa, 10.

OCENA SIŁY FUNDAMENTALNEJ SPÓŁEK SEKTORA SPOŻYWCZEGO NA GIEŁDZIE PAPIERÓW WARTOŚCIOWYCH W WARSZAWIE

STRESZCZENIE

W artykule przedstawiono propozycję zastosowania (uniwersalnej) metody oceny siły fundamentalnej spółki na przykładzie sektora spożywczego w Polsce. Proponowana metoda należy do grupy metod wielowymiarowej analizy porównawczej i ma zastosowanie do kategorii bezpośrednio niemierzalnych (kondycja ekonomiczno-finansowa, siła fundamentalna). Problem, jaki musi być rozwiązany, to sposób pomiaru siły fundamentalnej (atrakcyjności) spółki. Celem opracowania jest ocena siły fundamentalnej spółek sektora spożywczego w Polsce oraz wskazanie obszarów wykorzystania wyników badań w analizach praktycznych. W artykule opisano jak skonstruować taką miarę oraz jak wykorzystać w praktyce. W przykładzie empirycznym wykorzystano dane dla firm sektora spożywczego notowanych na Giełdzie Papierów Wartościowych w Warszawie w latach 2010–2014. Zaproponowano sposób oceny atrakcyjności inwestycyjnej przedsiębiorstw wchodzących w skład sektora spożywczego pod kątem ich siły fundamentalnej, czyli długookresowego charakteru inwestycji w ich akcje.

Słowa kluczowe: sektor spożywczy, siła fundamentalna spółek, wskaźnik siły fundamentalnej