

REMUNERATIONS OF MANAGEMENT BOARDS OF LISTED COMPANIES IN THE FOOD SECTOR IN 2016-2019

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Purpose: The purpose of the article is to examine whether the remunerations of management boards of listed companies in the food sector are related to the performance of companies, i.e. whether they perform a motivational function.

Design/methodology/approach: Analysis of secondary data from reports of listed companies. Statistical methods, correlation analysis, selection of diagnostic variables using the Bartosiewicz method and construction of econometric models.

Findings: Remunerations of management boards are strongly correlated with both the size of companies and their performance. They thus perform a motivational function.

Research limitations/implications: As not all companies report remunerations in an identical manner, there is no possibility to analyse in more detail e.g. remuneration of the leader and other management board members, or to break down remunerations of the management board into base salary and bonuses.

Practical implications: Advice to shareholders and supervisory boards regarding the amounts of management board remunerations.

Originality/value: The originality of the research consists in analysing the remunerations of management boards of listed companies in the food sector in terms of their relation to the results of operations and the size of their companies. Solutions for shareholders and supervisory boards were also proposed.

Keywords: stock exchange, food companies, director's remunerations.

Category of the paper: research paper.

1. Introduction

Goals of company operations are currently defined in different ways. However, regardless of the view of individual researchers on company goals, practically always at least one of the goals is the performance of the company measured by the financial result (Sudoł, 1999). Goals can only be achieved through proper management. One of the functions of management is motivation. Motivation is mainly considered in terms of the influence of management board on

the executive level. However, also management boards should be motivated, so as to make them focus on acting in the interest of the managed company.

Motivation as an important factor of human resources management has been analysed in research literature on management. According to Bagozzi et al., in the process of motivation, the goals of an organisation should be compared to the desires of the motivated. Motivation should be a model that allows to satisfy the desires when the goals are achieved (Bagozzi et al., 2003). Horwitz et al. provide a comprehensive model of motivation. One of the factors is remuneration (Horwitz et al., 2003). Sobocka-Szczapa, Banasiak and Kamińska (Sobocka-Szczapa, Banasiak, Kamińska, 2019) believe that motivation is considered to be a key activity determining the organisation's level of performance and competitiveness. According to them, both financial and non-financial motivational tools can be used. The financial ones mainly include remunerations and their derivatives. According to Armstrong and Taylor (Armstrong, Taylor, 2016) people are motivated when they expect that their actions lead to achievement of a goal and receipt of an appropriate reward. Motivated persons participate in non-mandatory activities. Their motivating factors include higher salaries and bonuses. Oleksyn lists motivation as one of the key functions of management. According to him, motivation is often perceived as manipulation (Oleksyn, 2017). He quotes President Eisenhower: *motivation is the art of getting people to do what you want them to do because they want to do it*. According to him, remuneration is one of the methods of motivation, although it also performs other functions.

Remuneration is one of the most strategically important objects of management (Witczak, 2017). Armstrong and Cummins devoted part of their study to the rules of management remuneration (Armstrong, Cummins, 2015). They suggest that the management board's remuneration should be open, be in line with corporate governance, reflect both the market value and the overall contribution of the board's work, but also perform a motivational function.

The purpose of the article is to examine whether the remunerations of management boards of WSE-listed companies in food sector seated in Poland are related to the performance of companies, i.e. whether they perform a motivational function. The selected sector results from the author's interest in food economy.

2. Material and methods

The research was based on secondary data from the annual reports of the analysed companies. The selected explanatory variables included data concerning the company size: sales revenues, employment, total assets, as well as data concerning the results of the companies' operations: financial result and ROE. ROE was calculated as the quotient of net profit and equity (Gabrusewicz, 2019). Total annual management board remuneration was selected as a response variable.

The relationship between the response variable and the explanatory variables was examined using Pearson's correlation coefficients between the response variable and respective explanatory variables (Woźniak, 2002). In order to examine whether the explanatory variables are mutually interdependent or not, the linear correlation coefficients between the explanatory variables were used.

An econometric model was then created to illustrate the relationship between the response variable and the explanatory variables. A linear model with the number of explanatory variables resulting from the method of variable selection was applied (Kukuła et al., 2009). For the purposes of selection of diagnostic variables, the Bartosiewicz method was applied with a terminal correlation of significant relationships $r^* = 0.5$, combined with a substantive selection of variables (Nowak, 1990).

3. Results

Tables 1, and 2 below present the research material from the reports of the analysed companies.

Table 1.

Data of the analysed companies year 2016 part 1

2016	Ambra	Atlanta	Gobarto	Żywiec	Helio	Krynica V	MP	Pamapol
Revenues in millions of PLN	241,5	262,59	1144	2357,69	137,5	166,68	112,39	248,95
Assets in millions of PLN	285,02	135,01	512,4	1799,58	85,83	117,54	120,26	205,38
Nett profit in millions of PLN	14,04	4,53	7,02	300,46	4,06	3,68	4,97	2,14
Equity in millions of PLN	211,82	66,54	248,69	201,85	54,38	47,72	69,22	121,37
Employees	413	325	760	1075	226	214	121	541
Remunerations of directors in thousand of PLN	3355	860	2126	10706	1826	1198	662	1517
ROE	0,0663	0,0681	0,0282	1,4885	0,0747	0,0771	0,0718	0,0176
Number of directors	3	3	4	7	2	2	1	3

Source: own study based on data from www.gpw.pl, 06.07.2020.

Table 2.

Data of the analysed companies year 2016 part 2

2016	Pepes	Seko	Tarczyński	Wawel	Otmuchów	Kruszwica	Kania
Revenues in millions of PLN	143,77	152,23	657,68	645,9	154,69	2411,38	1287,54
Assets in millions of PLN	210,96	119,91	475,2	672,81	199,56	997,77	802,77
Nett profit in millions of PLN	15,92	5,58	11,17	85,09	-34,71	65,34	46,18
Equity in millions of PLN	126,69	59,52	137,79	550,31	94,66	653	266
Employees	271	495	1255	908	502	893	849
Remunerations of directors in thousand of PLN	1136	608	2157	7489	520	5839	1130
ROE	0,12567	0,0938	0,0811	0,1546	-0,3667	0,1001	0,1736
Number of directors	2	3	4	2	3	7	4

Source: own study based on data from www.gpw.pl, 06.07.2020.

The analysed companies differ in size, which is expressed by three parameters, i.e. sales revenues, employment and balance sheet total. In terms of balance sheet total, the largest company is Grupa Żywiec S.A. with a balance sheet total of PLN 1,799.58 million; the largest number of employees is at Tarczyński S.A. (1,255 FTEs); and Zakłady Tuszczowe Kruszwica S.A. lead in terms of sales revenues with revenues amounting to PLN 2,411.38 million. The lowest balance sheet total is reported by Helio S.A. (PLN 85.83 million); the lowest number of employees is at Makarony Polskie S.A. (121 FTEs); the latter also generates the lowest revenues amounting to PLN 112.39 million. The average size of the balance sheet total is PLN 449.33 million, median is PLN 210.96 million, standard deviation is PLN 468.05 million, coefficient of variation is 1.04. The average employment is 589.87 FTEs, median is 502 FTEs, standard deviation is 346.69 FTEs, coefficient of variation is 0.59. The average sales revenues amount to PLN 674.97 million, median is PLN 248.95 million, standard deviation is PLN 787.05 million, coefficient of variation is 1.17. In the case of balance sheet total and sales revenues, these measures inform about a very high diversity of those companies both in terms of the size of assets and the generated sales; they are relatively the least diverse in terms of employment, although such diversity is also significant. In the context of sales revenues and balance sheet total, it should be noted that the median is significantly lower than the mean, which is particularly noticeable for sales revenues. This means that for more than a half of the analysed companies both the balance sheet total and revenues are significantly below the mean, and a relatively high value of the mean is due to the sensitivity of the mean to extreme values. In the case of employment, the mean is close to the median.

It is worth verifying whether the three company size measures were collinear in 2016. To this end, Pearson's correlation coefficient was applied (Woźniak, 2002). The correlation coefficients between employment, total assets and sales have been presented in Table 3.

Table 3.

Linear correlation coefficient between revenues, assets and employee in 2016 year

	Assets	Revenues	Employees
Assets	1	0,92	0,74
Revenues	X	1	0,70
Employees	X	x	1

Source: own study based on tables 1 and 2.

The data from Table 3 show that the company size measures are strongly correlated with each other, it is thus sufficient to use one company size measure.

In a situation where companies are highly diverse in terms of size, logic would dictate that the number of management board members should be larger for larger companies, which should be reflected in the correlation coefficient. In 2016, the correlation coefficient between the number of management board members and the size of assets was 0.84, which means that in general the relationship between the number of board members and the size of the company was maintained.

Pearson's correlation coefficient was also used to verify the relationship between management board's remuneration and the size or results of the company.

Table 4.

Correlation coefficient between management board's remuneration and the size or results of the companies in 2016 year

Assets	0,864
ROE	0,770
Revenues	0,731
Nett profit	0,894
Employees	0,599

Source: own study based on tables 1 and 2.

The data from Table 4 show that the remunerations of management boards of listed companies in the food sector are strongly correlated both with the data relating to the size of the company and with the data reflecting the performance of the company. The strongest correlation is between total annual remuneration of the management board and financial result; secondly, total assets; and thirdly, ROE, which is a relative value, thus it does not result from the size of the company.

Correlation coefficients between the explanatory variables have been presented below.

Table 5.

Correlation coefficients between the explanatory variables in 2016 year

	Assets	ROE	Revenues	Nett profit	Employees
Assets	1	0,814	0,920	0,915	0,738
ROE	X	1	0,624	0,960	0,405
Revenues	X	X	1	0,737	0,702
Nett profit	X	X	X	1	0,528
Employees	x	x	x	x	1

Source: own study based on tables 1 and 2.

After applying the Bartosiewicz variable selection method, it should be noted that all variables form a single graph. ROE and employment each have 3 correlations with others, while total assets, financial result and sales revenues each have 4 correlations. When applying the classic Bartosiewicz method, one should choose the variable with the most correlations with others and the highest correlation coefficient with the response variable, i.e. financial result. The econometric (stochastic) model describing the relationship between the management board's remuneration and the financial result is as follows:

$$y = 1535,62 + 33,79X_{wf} + \varepsilon, \quad (1)$$

where:

y – remunerations of directors in thousand of PLN,

X_{wf} – Nett profit in millions of PLN,

ε – random.

For this model, R^2 is 0.8, the average constant term error is 394.40, the average coefficient error at X_{wf} is 4.69, which means that at a significance level of 0.05 ($t_{0,05;13} = 2.16$) both parameters are significant.

On the basis of this model it can be concluded that on average, each additional PLN 1 million of net profit generates PLN 33.79 thousand of additional remuneration for the management board per year.

Tables 6, and 7 below present the research material from the reports of the analysed companies.

Table 6.

Data of the analysed companies year 2017 part 1

2017	Ambra	Atlanta	Gobarto	Żywiec	Helio	Krynica V	MP	Pamapol
Revenues in millions of PLN	252,37	199,47	1319,66	2245,74	178,56	206,83	124,19	259,9
Assets in millions of PLN	278,8	136,15	647,47	1778,28	90,69	127,93	122,88	206,55
Nett profit in millions of PLN	21,18	0,65	15,23	261,49	10,92	5,91	5,25	2,22
Equity in millions of PLN	219,89	65,17	264,19	165,47	65,73	50,03	72,16	123,59
Employees	404	303	792	1073	225	223	139	522
Remunerations of directors in thousand of PLN	3280	601	3693	11635	2595	716	628	1341
ROE	0,0963	0,0100	0,0576	1,5803	0,1661	0,1181	0,0728	0,0180
Number of directors	3	3	4	7	2	2	1	3

Source: own study based on data from www.gpw.pl, 06.07.2020.

Table 7.

Data of the analysed companies year 2017 part 2

2017	Pepes	Seko	Tarczyński	Wawel	Otmuchów	Kruszwica	Kania
Revenues in millions of PLN	162,45	184,67	739	618,46	161,85	2561,89	1415,08
Assets in millions of PLN	236,9	120,51	518,83	732,32	185,07	957,35	1068,81
Nett profit in millions of PLN	12,32	9,01	27,57	113,32	1,38	40,67	53,75
Equity in millions of PLN	139,11	66,47	154,38	630,7	98,62	639,3	319,75
Employees	286	471	1168	966	445	862	822
Remunerations of directors in thousand of PLN	1530	624	2378	7583	834	5341	1200
ROE	0,0886	0,1356	0,1786	0,1797	0,0140	0,0636	0,1681
Number of directors	2	3	3	2	3	7	4

Source: own study based on data from www.gpw.pl, 06.07.2020.

As it has been the case in 2016, in terms of balance sheet total, the largest company is Grupa Żywiec S.A. with a balance sheet total of PLN 1,778.28 million; the largest number of employees is at Tarczyński S.A. (1,255 FTEs); and Zakłady Tłuszczowe Kruszwica S.A. lead in terms of sales revenues with revenues amounting to PLN 2,561.89 million. Therefore, the leading companies are the same as in 2016. The lowest balance sheet total is reported by Helio S.A. (PLN 90.69 million); the lowest number of employees is at Makarony Polskie S.A. (139 FTEs); the latter also generates the lowest revenues amounting to PLN 124.19 million. The average size of the balance sheet total is PLN 480.57 million, median is PLN 236.90 million, standard deviation is PLN 482.93 million, coefficient of variation is 1.00.

The average employment is 580.07 FTEs, median is 471 FTEs, standard deviation is 337.68 FTEs, coefficient of variation is 0.58. The average sales revenues amount to PLN 708.67 million, median is PLN 252.37 million, standard deviation is PLN 805.95 million, coefficient of variation is 1.14. As it has been the case in 2016, for the balance sheet total and sales revenues, these measures inform about a very high diversity of those companies both in terms of the size of assets and the generated sales; they are relatively the least diverse in terms of employment, although such diversity is also significant. Again, similarly to 2016, in the context of sales revenues and balance sheet total, the median is significantly lower than the mean, which is particularly noticeable for sales revenues.

The correlation coefficients between employment, total assets and sales in 2017 have been presented in Table 8.

Table 8.

Linear correlation coefficient between revenues, assets and employee in 2017 year

	Assets	Revenues	Employees
Assets	1	0,89	0,78
Revenues	X	1	0,72
Employees	x	x	1

Source: own study based on tables 6 and 7.

The data from Table 8 show that, as it has been the case in 2016, the company size measures for 2017 are strongly correlated with each other, with little differences compared to 2016, it is thus sufficient to use one company size measure.

In 2017, the correlation coefficient between the number of management board members and the size of assets was 0.80, which means that in general the relationship between the number of board members and the size of the company was maintained.

Pearson's correlation coefficient between management board remuneration and explanatory variables in 2017 was:

Table 9.

Correlation coefficient between management board's remuneration and the size or results of the companies in 2017 year

Assets	0,822
ROE	0,791
Revenues	0,684
Nett profit	0,916
Employees	0,658

Source: own study based on tables 6 and 7.

The data from Table 9 show that, similarly to 2016, the remunerations of management boards of listed companies in the food sector are strongly correlated both with the data relating to the size of the company and with the data reflecting the performance of the company. The strongest correlation (stronger than in 2016) is between total annual remuneration of the management board and financial result; secondly, total assets; and thirdly, ROE.

Correlation coefficients between the explanatory variables have been presented below.

Table 10.*Correlation coefficients between the explanatory variables in 2017 year*

	Assets	ROE	Revenues	Nett profit	Employees
Assets	1	0,930	0,888	0,873	0,785
ROE	X	1	0,530	0,930	0,452
Revenues	X	X	1	0,624	0,716
Nett profit	X	X	X	1	0,658
Employees	x	x	x	X	1

Source: own study based on tables 6 and 7.

As it has been the case in 2016, all variables form a single graph. ROE and employment each have 3 correlations with others, while total assets, financial result and sales revenues each have 4 correlations. The highest coefficient of correlation with the response variable applies to the financial result. The econometric (stochastic) model describing the relationship between the management board's remuneration and the financial result is as follows:

$$y = 1304,87 + 42,02X_{wf} + \varepsilon, \quad (2)$$

where:

y – remunerations of directors in thousand of PLN,

 X_{wf} – Nett profit in millions of PLN, ε – random.

For this model, R^2 is 0.84, the average constant term error is 391.34, the average coefficient error at X_{wf} is 5.12, which means that at a significance level of 0.05 ($t_{0,05;13} = 2.16$) both parameters are significant.

On the basis of this model it can be concluded that on average, each additional PLN 1 million of net profit generates PLN 42.02 thousand of additional remuneration for the management board per year.

Tables 11, and 12 below present the research material from the reports of the analysed companies.

Table 11.*Data of the analysed companies year 2018 part 1*

2018	Ambra	Atlanta	Gobarto	Żywiec	Helio	Krynica V	MP	Pamapol
Revenues in millions of PLN	271,26	232,72	1254,87	3339,53	177,27	269,94	134,46	228,52
Assets in millions of PLN	298,42	141,07	627,41	1790,06	97,18	146,45	132,64	195,51
Nett profit in millions of PLN	24,11	7,75	8,32	312,7	11,07	5,38	5,07	0,6
Equity in millions of PLN	228,88	72,92	271,5	314,31	76,8	51,97	74,43	124,18
Employees	415	275	778	1094	239	295	139	508
Remunerations of directors in thousand of PLN	271,26	232,72	1254,87	3339,53	177,27	269,94	134,46	228,52
ROE	0,1053	0,1063	0,0306	0,9949	0,1441	0,1035	0,0681	0,0048
Number of directors	3	3	5	7	2	2	1	5,5

Source: own study based on data from www.gpw.pl, 06.07.2020.

Table 12.*Data of the analysed companies year 2018 part 2*

2018	Pepes	Seko	Tarczyński	Wawel	Otmuchów	Kruszwica	Kania
Revenues in millions of PLN	175,79	183,76	766,25	559,16	143,7	2683,78	1142,34
Assets in millions of PLN	257,78	139,71	619	773,68	179,5	1051,11	1196,46
Nett profit in millions of PLN	17,44	8,89	28,46	77,03	-13,35	97,81	64,4
Equity in millions of PLN	156,7	72,36	190,95	670,24	110,31	706,53	360,08
Employees	284	489	1015	1062	449	835	946
Remunerations of directors in thousand of PLN	1378	624	2257	7304	954	5127	1213
ROE	0,1113	0,1229	0,1490	0,1149	-0,1210	0,1384	0,1788
Number of directors	2	3	3	2	2	7	4

Source: own study based on data from www.gpw.pl, 06.07.2020.

As it has been the case in 2016 and 2017, in terms of balance sheet total, the largest company is Grupa Żywiec S.A. with a balance sheet total of PLN 1,790.06 million; it also employs the largest number of staff (1,094 FTEs) and leads in terms of sales revenues amounting to PLN 3,339.53 million, becoming the largest company in every aspect. The lowest balance sheet total is reported by Helio S.A. (PLN 97.18 million); the lowest number of employees is at Makarony Polskie S.A. (139 FTEs); the latter also generates the lowest revenues amounting to PLN 134.46 million, thus the smallest entities remained unchanged compared to 2017. The average size of the balance sheet total is PLN 509.73 million, median is PLN 257.78 million, standard deviation is PLN 502.32 million, coefficient of variation is 0.99. The average employment is 588.2 FTEs, median is 489 FTEs, standard deviation is 333.10 FTEs, coefficient of variation is 0.57. The average sales revenues amount to PLN 770.89 million, median is PLN 269.94 million, standard deviation is PLN 985.91 million, coefficient of variation is 1.28. As it has been the case in 2016 and 2017, for the balance sheet total and sales revenues, these measures inform about a very high diversity of those companies both in terms of the size of assets and the generated sales; they are relatively the least diverse in terms of employment, although such diversity is also significant. Again, similarly to 2016 and 2017, in the context of sales revenues and balance sheet total, the median is significantly lower than the mean, which is particularly noticeable for sales revenues.

The correlation coefficients between employment, total assets and sales in 2018 have been presented in Table 13.

Table 13.*Linear correlation coefficient between revenues, assets and employee in 2018 year.*

	Assets	Revenues	Employees
Assets	1	0,91	0,84
Revenues	X	1	0,69
Employees	X	X	1

Source: own study based on tables 11 and 12.

The data from Table 13 show that, as it has been the case in 2016 and 2017, the company size measures for 2018 are strongly correlated with each other, with little differences compared to 2016 and 2017, it is thus sufficient to use one company size measure.

In 2018, the correlation coefficient between the number of management board members and the size of assets was 0.70, which means that in general the relationship between the number of board members and the size of the company was maintained.

Pearson's correlation coefficient between management board remuneration and explanatory variables in 2018 was:

Table 14.

Correlation coefficient between management board's remuneration and the size or results of the companies in 2018 year

Assets	0,781
ROE	0,761
Revenues	0,779
Nett profit	0,868
Employees	0,671

Source: own study based on tables 11 and 12.

The data from Table 14 show that, similarly to 2016 and 2017, the remunerations of management boards of listed companies in the food sector are strongly correlated both with the data relating to the size of the company and with the data reflecting the performance of the company; it should be noted, however, that the correlation is much weaker. The strongest correlation (although notably weaker than in 2017) is between total annual remuneration of the management board and financial result; secondly, total assets; and thirdly, ROE.

Correlation coefficients between the explanatory variables have been presented below.

Table 15.

Correlation coefficients between the explanatory variables in 2018 year

	Assets	ROE	Revenues	Nett profit	Employees
Assets	1	0,756	0,908	0,885	0,844
ROE	X	1	0,746	0,946	0,467
Revenues	X	X	1	0,868	0,687
Nett profit	X	X	X	1	0,630
Employees	X	X	X	X	1

Source: own study based on tables 11 and 12.

As it has been the case in 2016 and 2017, all variables form a single graph. ROE and employment each have 3 correlations with others, while total assets, financial result and sales revenues each have 4 correlations. As it has been the case in previous years, the highest coefficient of correlation with the response variable applies to the financial result. The econometric (stochastic) model describing the relationship between the management board's remuneration and the financial result is as follows:

$$y = 1567,87 + 33,14X_{wf} + \varepsilon, \quad (3)$$

where:

y – remunerations of directors in thousand of PLN,

X_{wf} – nett profit in millions of PLN,

ε – random.

For this model, R^2 is 0.75, the average constant term error is 470.14, the average coefficient error at X_{wf} is 5.26, which means that at a significance level of 0.05 ($t_{0,05;13} = 2.16$) both parameters are significant.

On the basis of this model it can be concluded that on average, each additional PLN 1 million of net profit generates PLN 33.14 thousand of additional remuneration for the management board per year.

In 2019, due to the declared bankruptcy and lack of reliable data, Zakłady Mięsne Kania S.A. had to be excluded from the analysis.

Tables 16, and 17 below present the research material from the reports of the analysed companies.

Table 16.

Data of the analysed companies year 2019 part 1

2019	Ambra	Atlanta	Gobarto	Żywiec	Helio	Krynica V	MP
Revenues in millions of PLN	254,29	253,54	1483,13	3199,24	167,14	297,18	151,25
Assets in millions of PLN	283,57	158,31	668,96	2479,54	104,88	166,38	151,71
Nett profit in millions of PLN	28,09	2,92	-3,44	330,34	4,83	7,5	5,59
Equity in millions of PLN	239,83	69,74	268,05	187,6	81,63	51,38	77,37
Employees	226	269	947	1095	211	286	162
Remunerations of directors in thousand of PLN	4201	757	2965	13272	2456	900	788
ROE	0,1171	0,0419	-0,0128	1,7609	0,0592	0,1460	0,0723
Number of directors	3	3	5	7	2	2	1

Source: own study based on data from www.gpw.pl, 06.07.2020.

Table 17.

Data of the analysed companies year 2019 part 2

2019	Pamapol	Pepes	Seko	Tarczyński	Wawel	Otmuchów	Kruszwica
Revenues in millions of PLN	213,43	172,93	192,29	886,76	564,44	144,74	2683,78
Assets in millions of PLN	192,14	275,66	130,2	705,14	803,72	156,34	1051,11
Nett profit in millions of PLN	-9,2	19,18	7,01	29,66	57,86	-10,64	97,81
Equity in millions of PLN	114,98	164,44	74,99	214,43	690,6	99,64	706,53
Employees	482	281	480	1028	1118	497	835
Remunerations of directors in thousand of PLN	1410	1819	623	3854	6649	1597	5127
ROE	-0,0800	0,1166	0,0935	0,1383	0,0838	-0,1068	0,1384
Number of directors	2	3	3	2	2	7	4

Source: own study based on data from www.gpw.pl, 06.07.2020.

As it has been the case in 2016, 2017 and 2018, in terms of balance sheet total, the largest company is Grupa Żywiec S.A. with a balance sheet total of PLN 2,479.54 million; the largest number of employees is at Wawel S.A. (1,118 FTEs); Grupa Żywiec also leads in terms of sales revenues amounting to PLN 3,199.24 million, becoming the largest company based on the two out of three criteria. The lowest balance sheet total is reported by Helio S.A. (PLN 104.88 million); the lowest number of employees is at Makarony Polskie S.A. (162 FTEs); the lowest revenues are reported by Zakłady Cukiernicze Otmuchów S.A., amounting to PLN 144.74 million. The average size of the balance sheet total is PLN 523.40 million, median is PLN 233.90 million, standard deviation is PLN 640.30 million,

coefficient of variation is 1.22. The average employment is 565.5 FTEs, median is 481 FTEs, standard deviation is 360.28 FTEs, coefficient of variation is 0.64. The average sales revenues amount to PLN 761.72 million, median is PLN 253.92 million, standard deviation is PLN 1,000.80 million, coefficient of variation is 1.31. As it has been the case in 2016, 2017 and 2018, for the balance sheet total and sales revenues, these measures inform about a very high diversity of those companies both in terms of the size of assets and the generated sales; they are relatively the least diverse in terms of employment, although such diversity is also significant and higher than in previous years. Again, similarly to 2016, 2017 and 2018, in the context of sales revenues and balance sheet total, the median is significantly lower than the mean, which is particularly noticeable for sales revenues.

The correlation coefficients between employment, total assets and sales in 2019 have been presented in Table 18.

Table 18.

Linear correlation coefficient between revenues, assets and employee in 2019 year

	Assets	Revenues	Employees
Assets	1	0,91	0,74
Revenues		1	0,69
Employees			1

Source: own study based on tables 16 and 17.

The data from Table 18 show that, as it has been the case in 2016, 2017 and 2018, the company size measures for 2019 are strongly correlated with each other, with little differences compared to 2016, 2017 and 2018, it is thus sufficient to use one company size measure.

In 2019, the correlation coefficient between the number of management board members and the size of assets was 0.73, which means that in general the relationship between the number of board members and the size of the company was maintained.

Pearson's correlation coefficient between management board remuneration and explanatory variables in 2019 was:

Table 19.

Correlation coefficient between management board's remuneration and the size or results of the companies in 2019 year

Assets	0,954
ROE	0,857
Revenues	0,801
Nett profit	0,934
Employees	0,697

Source: own study based on tables 16 and 17.

The data from Table 19 show that, similarly to 2016, 2017 and 2018, the remunerations of management boards of listed companies in the food sector are strongly correlated both with the data relating to the size of the company and with the data reflecting the performance of the company; it should be noted, however, that the correlation is much weaker. The strongest

correlation is between total annual remuneration of the management board and financial result; secondly, total assets; and thirdly, ROE. The correlations are generally stronger than in 2018.

Correlation coefficients between the explanatory variables have been presented below.

Table 20.

Correlation coefficients between the explanatory variables in 2019 year

	Assets	ROE	Revenues	Nett profit	Employees
Assets	1	0,891	0,910	0,957	0,739
ROE	X	1	0,719	0,964	0,419
Revenues	X	X	1	0,830	0,693
Nett profit	X	X	X	1	0,543
Employees	X	X	X	X	1

Source: own study based on tables 16 and 17.

As it has been the case in 2016, 2017 and 2018, all variables form a single graph. ROE and employment each have 3 correlations with others, while total assets, financial result and sales revenues each have 4 correlations. Unlike in previous years, the highest correlation coefficient with the response variable applies to the balance sheet total. The econometric (stochastic) model describing the relationship between the management board's remuneration and the financial result is as follows:

$$y = 665,23 + 5,06X_{sb} + \varepsilon, \quad (4)$$

where:

y – remunerations of directors in thousand of PLN,

X_{sb} – Assets in millions of PLN,

ε – random.

For this model, R^2 is 0.91, the average constant term error is 373.71, the average coefficient error at X_{sb} is 0.46, which means that at a significance level of 0.05 ($t_{0,05;12} = 2.18$) constant term is insignificant, while the coefficient of X_{sb} is significant.

On the basis of this model it can be concluded that on average, each additional LN 1 million of net profit generates PLN 5.06 thousand of additional remuneration for the management board per year.

However, considering the fact that in previous years remunerations showed the strongest correlation with the financial result, this correlation is also very strong in 2019 (stronger than in 2018); the model was also estimated with the financial result as the explanatory variable.

$$y = 1858,94 + 35,93X_{wf} + \varepsilon, \quad (5)$$

where:

y – remunerations of directors in thousand of PLN,

X_{sb} – Assets in millions of PLN,

ε – random.

For this model, R^2 is 0.87, the average constant term error is 375.48, the average coefficient error at X_{wf} is 3.98, which means that at a significance level of 0.05 ($t_{0,05;12} = 2.18$) both parameters are significant.

On the basis of this model it can be concluded that on average, each additional PLN 1 million of net profit generates PLN 35.93 thousand of additional remuneration for the management board per year.

4. Summary

The conducted research has shown that in the case of listed companies in the food sector there is a strong correlation between the amount of management board remuneration and the results of the company's operations, as well as between the management board remuneration and the size of the company. Each additional million PLN of net profit generates on average, depending on the year, from PLN 33.14 to 42.02 thousand of additional remuneration for the management board. This proves that the level of remuneration is reasonable and performs the motivational function for board members, encouraging them to improve the performance of their operations. There is also a strong correlation between the size of the company and ROE, which means that generally larger companies benefit from economies of scale and are more economically efficient. It would be good to maintain these positive trends. We suggest increasing the differentiation of management board remuneration depending on the company's performance.

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