GROWTH AND PROFITABILITY OF POLISH AGRICULTURAL DISTRIBUTORS

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Abstract: *The relationships between growth of sales and profitability of companies have been little studied and reported results for different countries, industries and over the time are often contradictory. Here the relationships between growth of sales measured as the annual percentage variation in sales and profitability measured with return on sales, return on assets and return on equity for 24 Polish agricultural distributors, which account for over 90% of the market in sales terms, is studied in 11-years period between 2006 and 2016. This period includes faster and slower economic growth, but no recession. The Spearman rho and Kendall tau-B coefficients have been used to quantify these relationships and examine their statistical significance. The existence of positive and statistically significant relationships between various profitability measures and the growth of sales have been found. The highest correlation has been identified between the growth of sales and return on equity, weaker for return on assets and the weakest for return on sales. It is shown that relationships between the growth of sales and prior years profitability measures are weaker than those identified for the same year. Agricultural distributors in order to grow in a sustainable way should pay an attention to their profitability levels, which should be linked to the growth of sales.*

Keywords: *profitability, growth of sales, agricultural distributors*

1. Introduction

Both growth and profitability of companies have been since long an interest of decision makers, scholars and other stakeholders. According to Heffes and Sinnett [1], no matter if a company is a start-up or a multinational organization, private or public sector entity, almost every organization has growth on its agenda. The vast majority of papers on growth of companies are focused on growth determinants [2,3], which according to Storey [4] can be categorized into the three following groups: access to resources; the firm itself and the strategic decisions. The subject of profitability has also been thoroughly studied, with significant portion of papers relating to profitability determinants [5-7].

Despite relatively large body of literature on growth and profitability of companies, the literature on mutual relationships between growth and profitability of companies is considerably narrow. Furthermore, the findings of different studies on relationships between growth and profitability **are often inconsistent or even contradictory**. According to, for example, Hoy et al. [8] there is a significant and negative relationship between growth of companies and their profitability. The findings of other studies claim the opposite, i.e. the existence of positive relationships between the growth and the profitability of companies [9-12]. Finally, remaining scholars postulate relationship between growth and profitability is insignificant [13,14]. Given, aforementioned contradictions, it can be

concluded, that the relationships between growth and profitability of companies might not be the same for different countries, industries and over the time. Therefore empirical studies at this stage, should focus on specific industries or countries, so next, once a critical mass of research papers is exceeded, generalized findings can be formulated.

The aim of this paper is to study the mutual relationships between growth and profitability of Polish agricultural distributors. The agricultural distributors are defined for the purposes of this paper as companies that supply farms over 50 hectares and shops supposed to supply remaining smaller farms. The key merchandises of studied distributors comprise crop protection, seeds and fertilizers. Additionally, as auxiliary activities, agricultural distributors are feeds and grains trading with their clients. Polish agricultural distributors have been selected for this study, because these companies are responsible for the supply of large volume of merchandises (yearly sales revenues are over PLN 12 billion). They form a significant part of agri-food systems, which are, in turn, a part of global food supply systems. According to authors knowledge, this industry has not been yet sufficiently studied. Therefore, the contribution of this paper to the extant literature is by empirically investigating the mutual relationships between growth of sales and profitability of Polish agricultural distributors.

The paper is organized as follows. In the next section, the research method employed in this study is explained. Next, the research findings are presented and discussed. Finally, conclusions of this study, together with its limitations and recommendations for future research are being provided.

2. Methodology

The sample for this study comprises figures relating to growth of sales and profitability of 24 Polish agricultural distributors in an 11-years period between 2006 and 2016. According to authors best knowledge (one of the authors was employed in the studied industry over 5-years on executive position) stated 24 companies account for over 90% of the market in sales terms. Additionally, it should be noted that two companies, namely Polish Agro and BayWa Agro Polska, are subsidiaries of large multinational companies, which entered Polish agricultural distributors market.

The figures for this study were obtained from Emerging Markets Information Service (EMIS). In particular, financial statements of 24 analyzed companies in years between 2006 and 2016 have been obtained from this database. Since EMIS database has not comprised financial statements of studied companies for each year in the studied periods and because of the use of lagged variables, the number of observations reduced to 203 accordingly. A detailed list of studied companies along with the number of observations and mean values of selected data are given in Appendix 1.

Growth is usually measured as a variation of sales or the number of employees. Several researchers however, measure the growth as the variation of market shares or profitability ratios [15-17]. In this paper, the growth is calculated for each company, as the annual percentage variation in sales.

In the literature, profitability is commonly measured with return on sales (ROS), return on assets (ROA) and return on equity (ROE) measures. The return (numerator of these fractions) can represent profits after tax, profit before tax, EBIT (earnings before interests and tax) or EBITDA (earnings before interests, tax, depreciation and amortization) [18-21]. In this study, as to understand profitability thoroughly stated three profitability measures, ROS, ROA and ROE have been calculated with the use of net result (profit after tax), EBIT and EBITDA. Additionally, as prior year performance may influence results of the next

year, all profitability measures have been also analyzed lagged. Theoretically, if the company pursue profitability too aggressively, this may influence negatively growth of sales in the following year. As a consequence of above, 18 variables listed in table 1 have been used as proxies of profitability.

Table 1. Growth and profitability measures used in the study

Variable	Acronym	Description
Growth of sales	GRS	The difference of sales and prior year's sales divided by prior year's sales
Return on sales	ROS	Ratio of net result to total of sales
Return on sales 2	ROS2	Ratio of EBITDA (earnings before interests, tax, depreciation and amortization) to total of sales
Return on sales 3	ROS3	Ratio of EBIT (earnings before interests and tax) to total of sales
Return on assets	ROA	Ratio of net result to total of assets
Return on assets 2	ROA2	Ratio of EBITDA to total of assets
Return on assets 3	ROA3	Ratio of EBIT to total of assets
Return on equity	ROE	Ratio of net result to equity
Return on equity 2	ROE2	Ratio of EBITDA to equity
Return on equity 3	ROE3	Ratio of EBIT to equity
Lagged ROS	ROSPY	Return on sales – prior year
Lagged ROS2	ROS2PY	Return on sales 2 – prior year
Lagged ROS3	ROS3PY	Return on sales 3 – prior year
Lagged ROA	ROAPY	Return on assets – prior year
Lagged ROA2	ROA2PY	Return on assets 2 – prior year
Lagged ROA3	ROA3PY	Return on assets 3 – prior year
Lagged ROE	ROEPY	Return on equity – prior year
Lagged ROE2	ROE2PY	Return on equity 2 – prior year
Lagged ROE3	ROE3PY	Return on equity 3 – prior year

In the next step of the research, a descriptive statistic have been reviewed. Next normality assumption of studied variables have been verified. This is because significant portion of statistical test of significance requires normality assumption of both tested variables to be met or nearly met [22]. In this study normality assumption was tested with Doornik-Hansen and Shapiro-Wilk tests of normality [23,24]. The null hypothesis for both of these tests is the same and states that the variables are normally distributed. Finally, relevant tests of significance have been undertaken.

3.   Results and discussion

Descriptive statistics of variables used in this study are provided in Table 2. On the average, agricultural distributors included in studied sample exhibit a high mean growth of sales of 0.185 over the studied period from 2006 to 2016. **The difference between the mean and the standard deviation of GRS variable points out great differences among growth rates of studied companies within the analyzed period.** Not all of the companies have been profitable in each of the studied years, i.e. 46 out of 203 observations are negative, with the minimum at -0.492.

Table 2. Descriptive statistics of variables used in the study

Variable	Mean	SD	Median	Min	Max	Skewness	Kurtosis
GRS	0,185	0,675	0,111	-0,492	9,062	11,35	145,67
ROS	0,015	0,023	0,014	-0,151	0,07	-2,08	14
ROS2	0,028	0,025	0,024	-0,088	0,109	0,26	4,47
ROS3	0,023	0,023	0,02	-0,089	0,094	-0,16	4,76
ROA	0,048	0,121	0,049	-1,437	0,255	-9,15	109,96
ROA2	0,091	0,092	0,08	-0,838	0,336	-4,83	49,86
ROA3	0,074	0,09	0,065	-0,844	0,307	-5,07	53
ROE	0,181	0,309	0,171	-1,142	2,063	1,04	15,74
ROE2	0,304	0,626	0,282	-4,714	6,073	1,23	54,22
ROE3	0,232	0,524	0,229	-4,693	3,732	-2,78	46,89
ROSPY	0,016	0,026	0,015	-0,157	0,07	-2,94	18,45
ROS2PY	0,029	0,028	0,025	-0,154	0,109	-1,2	11,33
ROS3PY	0,023	0,026	0,021	-0,156	0,094	-1,66	13,22
ROAPY	0,054	0,123	0,054	-1,437	0,267	-8,89	105,75
ROA2PY	0,097	0,095	0,092	-0,838	0,37	-4,52	45,79
ROA3PY	0,08	0,092	0,072	-0,844	0,344	-4,74	48,75
ROEPY	0,201	0,305	0,185	-1,106	2,063	1,34	14,87
ROE2PY	0,31	0,478	0,313	-4,714	1,75	-5,78	59,29
ROE3PY	0,246	0,464	0,253	-4,693	1,778	-6,04	62,86

Source: Author's compilation based on 203 observations

Since studied companies are distributors, primarily responsible for logistics, trade financing and provision in limited extent advisory services relating to merchandises sold, net results compared to sales revenues are very low, amounting to, on average, 0,015 (ROS). Despite low sales profitability ratios, sales revenues of Polish agricultural distributors in studied period were high (PLN 413 million on average), while sales revenues of 5 out of 24 studied companies exceeded PLN 1 billion. Stated high sales levels with relatively low equity of studied companies, contributed to sound return on equity ratios, as mean value and median of ROE for this sample totaled 0,181 and 0,171 respectively. The differences between **the minimum and the maximum values and standard deviations of studied profitability ratios indicate high volatility of profits in contemplated industry**.

The normality assumption of studied variables we tested with Doornik-Hansen and Shapiro-Wilk tests of normality [23,24]. We obtained that none of studied variables have the normal distribution. Pearson correlation coefficients was therefore no appropriate for further analysis. Instead Spearman rank correlation coefficient and Kendall rank correlation coefficient can be used. Both of these tests are non-parametric measures of rank correlation and conversely to Pearson correlation are resistant to the effects of outliers and nonnormality [22]. The results of undertaken calculations are provided in Table 3.

Table 3. Results of Spearman and Kendall tests and their p-values (one side)

	SPEARMAN rho			KENDALL tau-B		
	rS:	p		tau-b:	p	
ROS	0,0784	0,133		0,08	0,048	*
ROS2	0,0979	0,0823		0,0919	0,0272	*
ROS3	0,1324	0,0298	*	0,1099	0,0103	*
ROA	0,1109	0,0576		0,1061	0,0127	*
ROA2	0,1341	0,0282	*	0,1166	0,0071	*
ROA3	0,1622	0,0104	*	0,1352	0,0022	*
ROE	0,305	0	*	0,2349	0	*
ROE2	0,2748	0	*	0,2155	0	*
ROE3	0,2796	0	*	0,2226	0	*
ROSPY	0,0288	0,3416		0,0596	0,1042	
ROS2PY	0,0019	0,4895		0,0344	0,2343	
ROS3PY	0,0019	0,4895		0,0344	0,2343	
ROAPY	-0,0003	0,4982		0,0375	0,2145	
ROA2PY	0,143	0,0209	*	0,1245	0,0043	*
ROA3PY	-0,0756	0,1417		-0,0207	0,3309	
ROEPY	0,143	0,0209	*	0,1245	0,0043	*
ROE2PY	0,1615	0,0107	*	0,1289	0,0033	*
ROE3PY	0,1566	0,0129	*	0,1238	0,0045	*

* - significant at 5%

Source: Author's compilation based on 203 observations

Both Spearman rho rank correlation coefficients and Kendall tau-B rank correlation coefficients confirmed that there is statistically significant and positive relationship between growth of sales and profitability of Polish agricultural distributors. Furthermore, the results are significant for all 3 commonly used profitability measures, i.e. return on sales (ROS), on assets (ROA) and on equity (ROE), calculated with the use of profits after tax, EBITDA and EBIT. These results are aligned to the findings in ref.[9-12] and the opposite to the findings in ref.[8,13,14]. The findings provided in this study suggest that the companies that grow, in term of sales, are profitable. **The analyzed period in this study is 11 consecutive years, and comprise the same companies through the whole time of the study.** This period is long enough to hide short term tendencies, where due to temporary factors, such as low sales prices or heavy marketing expenditures, the sales can grow faster in exchange for reduced profitability. Such short term fast growth of sales should not be considered sustainable, however.

The strongest positive dependence has been identified between growth of sales and ROE, for which, Speraman rho coefficient totaled 0,305, while Kendall tau-B amounted to 0,2349. Weaker, but yet significant relationships have been identified between growth of sales and return on assets ratios, while the weakest for return on sales ratios. Although, both profitability and growth of sales are complex issues, with plenty of determinants behind them, the observed declining strength of dependence between growth of sales and ROE, ROA and ROS, respectively, might result from the fact that ROS is the most price sensitive ratio, whereas ROE the least, among analyzed 3 variables. It is widely acknowledged that the higher the prices the lower the sales levels (demand and supply law). Hence, if the company prices its products higher its ROS is supposed to increase whereas sales decline or grow slower. ROA, as compared to ROS, is a more complex ratio, i.e. it allows management to select, inter alia, optimal fixed assets, trade accounts receivable and inventory levels. ROA therefore, allows more variables to contribute to profitability making the price effect less significant. The concept of ROE

includes the effect of external financing [25], which if less expensive (effective interests rate) than ROE should improve contemplated return on equity. Given studied companies are distributors, which create low value added for clients, their sales are supposed to be very price sensitive, which additionally confirms the weakening of relationships between growth of sales and ROE, ROA and ROS respectively.

The relationships between growth of sales (in a year x) and prior year profitability (a year x-1) are, in general weaker than those identified for results relating to the same year figures. Nonetheless relationships between growth of sales and prior years profitability are significant and again positive for all ROE ratios and ROA, however, in case of the latter, calculated with EBITDA only. Again, given the studied companies are distribution ones, it can be assumed that the clients are not loyal to their suppliers, but primarily purchase merchandises bases on proposed to them current offers, which unless competitive, can be rejected.

4. Conclusions

The purpose of his study was to investigate mutual relationships between growth of sales and profitability of companies. Given contradictory results from different industries provided so far in the literature, as per which the relationships between growth of sales and profitability **may be positive, negative or might not be statistically significant**, it was concluded to study in deep, only one industry. Accordingly, Polish agricultural distributors has been selected for this study. Stated industry has been selected because Polish agricultural distributors are responsible for the supply of large volume of merchandises (studied companies sold over PLN 12 billion in each of the last 3 years of the study), constitute a significant part of agri-food systems, which form a part of global food systems and overall this industry has not been yet sufficiently studied. The sample for this study comprise 24 distribution companies in a 11-years period from 2006 to 2016. The empirical part of this study used Spearman rho and Kendall tau-B rank correlation coefficients, because both of these tests are considerably resistant to the effects of outliers and nonnormality of variables distribution.

The results obtained in the empirical part of this paper, clearly indicate positive and statistically significant relationships between various profitability ratios and growth of sales. The highest dependence coefficients are obtained for return on equity and growth of sales (0,305 – Spearman rho and 0,2349 - Kendall tau-B). In due course of undertaken research two more tendencies have been identified. The first, is the declining strength of dependence between growth of sales and return on equity, return on assets and return on sales (ROS), respectively, which might result from the fact that ROS is the most price sensitive ratio. The second, is **that the relationships between growth of sales and prior years' profitability are, in general weaker than those identified for results relating to the same year figures.** Given studied companies are distributors, primarily responsible for logistic activities and trade financing, their clients might not be loyal, but rather price or current offer sensitive, which results in placing current orders primarily based on current offers and not based on existing historical relationships. Based on the above, the practical findings of this study for decision makers are that **the growth of the studied companies is closely and positively linked to their profitability,** therefore the companies in order to grow in a sustainable way should also pay an attention to their profitability levels, which should be linked to the growth of sales.

This study has however, several limitations, which overall are consideration of only one industry and one country. Therefore, the findings obtained in this study might not be appropriate to generalizations. This however, due to considerable contradictions presented in the literature, has been done deliberately, as to understand one industry and obtain robust results. The following limitation of the study is the length of studied period, which is 11

consecutive years. **Although this period includes faster and slower economic growth, no recession within studied period appeared**. This limitation is a result of the fact that the figures relevant to longer period have not been publicly available.

The above presented limitations of the study show the direction for further research, which should focus on other industries, other countries and consider longer time frames, so that once considerable body of papers emerge, generalized findings widely applicable can be identified. Additionally, the significance of growth and profitability issues in it selves, its practical implications for decision makers and lack of consensus among scholars fully justifies undertaking of further research.

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Appendix 1 List of companies with the number of observations N
(last row shows the total number of observations and mean values of data in columns)

Comapany	N	GRS	ROS	ROS2	ROS3	ROA	ROA2	ROA3	ROE	ROE2	ROE3
Chemirol	10	0,08	0,05	0,07	0,06	0,11	0,15	0,13	0,15	0,21	0,18
Osadkowski	9	0,11	0,01	0,02	0,02	0,04	0,09	0,06	0,13	0,27	0,19
Agrolok	10	0,14	0,01	0,02	0,02	0,02	0,08	0,07	0,12	0,31	0,29
AmpolMerol	10	0,12	0,02	0,03	0,02	0,07	0,12	0,1	0,19	0,33	0,28
Agrosimex	10	0,11	0,05	0,07	0,06	0,14	0,2	0,18	0,29	0,39	0,36
Scandagra	10	0,13	-0,01	0,01	0	-0,02	0,03	0,01	-0,1	0,1	0,03
Agrii	10	0,15	0,02	0,03	0,02	0,14	0,2	0,17	0,41	1,07	0,78
Procam	9	0,26	0,02	0,03	0,03	0,04	0,07	0,05	0,34	0,58	0,47
Osadkowski-Cebulski	10	0,16	0,02	0,02	0,02	0,06	0,07	0,05	0,18	0,22	0,17
ATR	10	0,21	0,01	0,02	0,02	0,03	0,07	0,06	0,11	0,22	0,19
AgroSieć	10	0,11	0,01	0,02	0,01	0,03	0,07	0,05	0,11	0,27	0,18
Narolco	10	0,18	0,01	0,03	0,02	0,02	0,06	0,05	0,22	0,68	0,58
Ulenberg	6	0,27	0,05	0,1	0,07	0,07	0,12	0,09	0,3	0,52	0,4
Progress Chem	4	-0,1	0,01	0,02	0,02	0,03	0,07	0,05	0,38	0,84	0,64
Wialan	10	0,19	0,03	0,03	0,03	0,1	0,13	0,11	0,29	0,38	0,31
Kazgod	8	0,11	0,01	0,01	0,01	0,04	0,06	0,05	0,1	0,17	0,13
Agro-Efekt	8	0,08	0,02	0,03	0,03	0,07	0,11	0,1	0,17	0,29	0,25
AgroBakałarzewo	8	0,17	0,01	0,01	0,01	0,04	0,07	0,05	0,13	0,28	0,22
Agroskład	10	0,08	0,02	0,03	0,02	0,1	0,12	0,11	0,21	0,25	0,23
Agricola-Lublin	9	0,05	0,01	0,02	0,01	0,06	0,12	0,08	0,12	0,23	0,16
ChemagroTrade	8	0,18	-0,01	0,02	0,02	-0,15	-0,02	-0,02	0,09	-1,08	-1,07
Adler Agro	10	0,08	0,01	0,02	0,02	0,04	0,07	0,05	0,2	0,36	0,28
Polish Agro	2	0,8	-0,04	-0,03	-0,04	-0,12	-0,09	-0,1	-1,12	-0,85	-0,96
Baywa	2	0,3	-0,05	-0,04	-0,04	-0,13	-0,11	-0,13	-1,14	-0,97	-1,06
	203	**0,19**	**0,02**	**0,03**	**0,02**	**0,05**	**0,09**	**0,07**	**0,18**	**0,3**	**0,23**

Source: Author's compilation based on 203 observations