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DETERMINANTS OF FINANCIAL PROFITABILITY OF ANIMAL FEED PRODUCERS

Key words: return on equity, determinants of profitability, feedingstuffs producers

ABSTRACT. Return on equity is among the basic ratio of economic benefit for enterprise owners. It must be generated as a fundamental condition for the continuous operation and development of an enterprise, regardless of the type of business. The main purpose of this paper was to identify the strength and direction of impact of selected determinants behind financial profitability of animal feed producers. The analysis was based on a six-factor cause-and-effect model linking the determinants of financial profitability to three areas of business activity: the operating, financial and fiscal area. This study relied on the financial data between the years 2011–2016 of individual financial statements of animal feed producers. Based on the results of multiple regression analysis, no factors could be identified that consistently affect the return on equity in the period considered. However, the following can be concluded to be the main factors affecting the variation in return on equity of animal feed producers: the ratio of cash from operating activities to net sales; the return on capital employed; and the financing structure. As shown by this study, in order to improve profitability ratios and, thus, to provide more value to owners and increase the value of the company, managers of establishments producing animal feed should focus their efforts on improving cash management efficiency and asset turnover as well as managing sources of funding.

INTRODUCTION

Providing greater value to capital owners is one of the fundamental business objectives. Usually, benefits delivered to capital providers are measured using return on equity, also referred to in literature as financial profitability [Bieniasz 2015]. With this ratio, it is possible to assess whether an investment is viable, on the one hand, and to determine the efficiency of own resources engaged in business activities, on the other [Gołaś 2010]. The higher the ROE, the better the financial condition of the enterprise is and the higher the benefits delivered to the owners are [Czerwińska-Kayzer 2012].

ROE maximization is determined by multiple factors which, generally speaking, can be grouped as non-economic and financial/economic aspects. Because of the essence of this problem, many research efforts are focused on both the theory and practice of exploring the drivers of profitability. According to studies by Rachna Shah and Hojung Shin [2007] and Azhagaiah Ramachandran and Muralidharan Janakiraman [2009], return on equity is adversely affected by a low inventory turnover ratio. In turn, as demonstrated by Zbigniew Gołaś and co-authors, [2008], the following has a considerable impact on

ROE: the sales margin and asset turnover. Conversely, taxation levels and parameters of the financial and capital structure have a smaller influence. Barabara Batóg and co-authors [2007] demonstrated that profitability was driven by: the ratio of cash return on stockholder equity, the depreciation rate, and return on assets. Because of the absence of reliable research results and the changing economic and legal framework, the identification of determinants of financial profitability remains a major issue. In the context of the continuous need for examining factors underlying changes in financial profitability, it is crucial to ask the following question: what is the impact of factors related to the three business areas (operations, finance and taxes) on financial profitability levels?

With reference to the research question formulated above, the purpose of this paper was to identify the strength and direction of impact of selected determinants underlying financial profitability of animal feed producers.

MATERIAL AND METHODOLOGY OF STUDIES

Usually, financial profitability is measured and assessed using a synthetic financial indicator [Sierpińska, Jachna, 2004] which compares net profits to equity [Preissler 2008]. However, return on equity, as a single indicator, does not allow much room for interpretation and, therefore systems of indicators are increasingly used in financial assessments [Bieniasz et al. 2008]. They enable a multidimensional causative analysis which allows to indicate the strength and direction of impact of causative factors on the aspects examined, including profitability [Czerwińska-Kayzer 2014].

A six-factor model extending over three business areas was used to meet the goal set out in this paper. Operational factors were described using both accrual-based indicators – asset turnover (RA) and cash-based indicators – the ratio of cash from operating activities to net sales (WGS), the share of operating profit in the operating cash flow (QP). The financial dimension is measured with the financial structure indicator (WSF) and the financial charge ratio (WKF). In turn, the tax effect ratio (WEP) represents the fiscal dimension. The model can be presented as follows [Czerwińska-Kayzer 2018]:

$$ROE = WGS \times QP \times RA \times WSF \times WKF \times WEP$$

or

$$\frac{ZN}{KW} = \frac{PPO}{PS} \times \frac{EBIT}{PPO} \times \frac{PS}{A} \times \frac{A}{KW} \times \frac{ZB}{EBIT} \times \frac{ZN}{ZB}$$

The strength and direction of impact of selected determinants of financial profitability was assessed based on the linear regression method which may be presented as follows [Budka, Wagner 2007]:

$$y = \beta_0 + \beta_1 x_1 + \cdots + \beta_6 x_6 + e$$

where: y – financial liquidity (ROE), the explained variable; x_1– ratio of cash from operating activities to net sales (WGS); x_2 – cash quality (QP), x_3 – asset turnover (RA), x_4– financial structure indicator (WSF), x_5 – financial charge ratio (WKF), x_6– tax effect ratio (WEP), $\beta_0, \beta_1, \ldots, \beta_6$ – regression coefficients i e – random error.

This study relied on data from individual annual financial statements of 45 animal feed producers interviewed directly in 2018 for the purposes of the multi-annual programme run by the Ministry of Agriculture and Rural Development[1]. The study sample was selected purposefully. The assumption was made that the enterprises qualified for this study were engaged in continuous economic activity in the years 2011-2016, and prepared and published their financial statements throughout that period.

DRIVERS AND LEVELS OF PROFITABILITY RECORDED BY ANIMAL FEED PRODUCERS IN 2011-2016

Table 1 presents the levels of return on equity recorded in 2011–2016 by animal feed producers covered by this study. As shown by this compilation, ROE varied very strongly across the companies surveyed. In the study period, the mean ROE level ranged from −30.1% in 2012 to 21.3% in 2016. The skewness index for 2011, 2014 and 2016 suggests some slight right-side asymmetry, reflecting the predominance of companies at lower levels of profitability in the years considered. Conversely, left-side symmetry was observed in 2012, 2013 and 2015 which means that most companies were at above-average levels of profitability.

Changes in financial profitability were affected by different multipliers which themselves also varied to a different extent (table 2). High levels of variability were found in: the ratio of cash from operating activities to net sales (from 97 to 153%); the share of operating profit in operating cash flow (from 88 to 488%), the financing structure ratio (from 53 to 111%) and the financial charge ratio (from 31 to 197%). The two first

Table 1. Selected descriptive statistic parameters of return on equity for animal feed producers in 2011-2016

ROE*	2011	2012	2013	2014	2015	2016
Ø [%]	18.7	-30.1	10.9	17.2	10.8	21.3
min [%]	-3.6	-64.1	-65.4	-32.0	-55.3	-20.9
max [%]	85.0	48.4	63.5	83.0	53.3	60.9
Q_1 [%]	7.3	5.9	6.9	6.7	5.1	3.8
Q_3 [%]	22.8	19.0	20.4	22.5	19.4	20.3
v [%]	92.1	819.8	273.2	128.9	179.9	279.9
S	2.0	-5.9	-2.2	1.8	-1.5	5.6

Ø – average, min – minimum, max – maximum, Q_1 – quartile 1, Q_3 – quartile 3, v – coefficient of variation, S – skewness

Source: own study

Table 2. Selected descriptive statistic parameters of the regression model for animal feed producers in 2011-2016

Indicators*	Parameters**	2011	2012	2013	2014	2015	2016
WGS		0.07	0.05	0.06	0.06	0.05	0.05
	min	-0.03	-0.13	0.00	0.00	-0.11	-0.01
	max	0.37	0.39	0.29	0.28	0.38	0.23
	v [%]	113.3	139.58	101.17	102.76	153.15	96.66
	S	2.60	2.37	2.40	1.99	2.15	1.98
QP		0.63	0.12	0.82	0.72	0.46	0.44
	min	-1.93	-12.65	-1.40	-0.28	-9.91	-3.74
	max	1.51	2.26	4.33	1.47	6.86	2.65
	v [%]	88.6	314.95	94.50	46.10	488.22	268.53
	S	-3.28	-5.92	2.22	-0.21	-2.54	-2.07
RA		2.6	2.64	2.76	2.93	2.64	2.64
	min	0.4	0.46	0.57	0.48	0.42	0.39
	max	5.6	5.13	5.30	9.03	8.08	8.08
	v [%]	43.2	42.67	39.71	50.70	52.81	51.66
	S	0.51	0.34	0.30	1.96	1.77	1.73
WSF		2.70	-0.02	2.84	3.10	2.77	1.18
	min	1.09	-9.79	-5.28	1.13	1.12	-6.04
	max	7.74	9.12	11.91	20.34	10.99	12.01
	v [%]	52.8	99.96	97.14	111.12	77.18	97.50
	S	1.74	-5.91	1.16	4.08	2.52	-5.45
WKF		0.83	0.83	0.93	0.66	0.84	0.69
	min	0.03	0.29	-0.59	-4.39	0.19	-7.02
	max	1.80	1.73	5.29	1.23	1.28	1.56
	v [%]	38.1	35.03	88.23	135.98	31.32	197.30
	S	0.25	0.69	4.29	-5.30	-0.59	-5.43
WEP		1.02	0.85	0.90	0.89	0.87	0.91
	min	0.73	-0.14	0.72	0.51	-0.01	0.14
	max	3.90	1.00	1.45	2.73	1.93	1.74
	v [%]	60.0	23.79	16.33	37.35	30.36	27.23
	S	4.07	-3.37	1.60	4.92	0.69	0.79

* determined indices as in the methods section of the article

** determine d by statistic parameters as in table 1

Source: own study

variables demonstrated the highest relative variability and, therefore had the strongest impact on variability in the return on equity. Relatively lower variability was observed in other variables, which suggests they had a smaller contribution to changes in financial profitability of animal feed producers. In this context, the distribution of enterprises by different multipliers seems interesting. With regard to the ratio of cash from operating activities to net sales and the asset turnover ratio, the skewness index indicated a right-side asymmetry in each year covered by this analysis, thus suggesting a dominance of companies with lower cash-generating potential and a slower turnover of assets. In turn, the distributions of other parameters varied from one year to another. Negative skewness was recorded for the share of operating profit in operating cash flow in 2011, 2012, 2014, 2015 and 2016, the financing structure ratio in 2012 and 2016, the financial charge ratio in 2014, 2015 and 2016, and the tax effect ratio in 2012. This means that most companies surveyed demonstrated an above-average performance in the years considered. Conversely, right-side asymmetry was found in the share of operating profits in operating cash flow in 2013, the financing structure ratio in 2011, 2013, 2014 and 2015, the financial charge ratio in 2011, 2012 and 2013, and the tax effect ratio in 2011, 2013, 2014, 2015 and 2016.

Based on data presented so far, it may be concluded that the main reasons behind changes in the animal feed producers' return on equity could be the varying parameters of operating activities, i.e. the share of operating profit in operating cash flow and fluctuations in the capital and financial structure.

QUANTITATIVE ANALYSIS OF FINANCIAL PROFITABILITY DETERMINANTS OF ANIMAL FEED PRODUCERS

The assessment of strength and direction of impacts on the levels of financial profitability of animal feed producers was based on the six-factor model, as presented above, which establishes a link between ROE and three areas of business activity: operating, financial and fiscal.

Table 3 shows the coefficients of multiple regression equations between return on equity and the six statistically significant explanatory variables, i.e. the ratio of cash from operating activities to net sales (WGS), the share of operating profit in operating cash flow (referred to as cash quality) (QP), asset turnover (RA), the financing structure ratio (WSF), the financial charge ratio (WKF) and the tax effect ratio (WEP). The following conclusions may be drawn based on this data:

1. The explanatory variables used in regression models explained the variation in financial profitability levels to a relatively large extent. The coefficient of determination varied in the range of 40.1 to 97.6%.
2. In 2011 and 2012, variation in the financial profitability of selected animal feed producers was determined by three factors, i.e. the ratio of cash from operating activities to net sales, the asset turnover ratio and the financing structure ratio. Note that the coefficients of explanatory variables referred to above were positive; this means they had a positive impact on financial profitability. Parameters of the regression model suggest these factors have a relatively strong impact on the explained variable.

Table 3. Multiple regression models for return on equity in feed enterprises in the years 2011-2016

Multiple regression coeffi-cients*	2011 estimation of parameter	2011 statistics t	2012 estimation of parameter	2012 statistics t	2013 estimation of parameter	2013 statistics t	2014 estimation of parameter	2014 statistics t	2015 estimation of parameter	2015 statistics t	2016 estimation of parameter	2016 statistics t
Constant term	-0.328	-1.794 (0.084)	-0.675	-2.455 (0.020)	0.112	0.334 (0.771)	-0.435	-2.835 (0.008)	-0.149	-1.209 (0.236)	-0185	-2.323 (0.027)
WGS	1.100	2.455 (0.021)	2.801	4.219 (0.000)	2.796	3.227 (0.003)	1.716	3.296 (0.003)	1.764	5.403 (0.000)	0.577	1.439 (0.161)
QP	0.062	0.904 (0.374)	-0.004	-0.332 (0.742)	0.083	1.443 (0.160)	0.211	2.346 (0.026)	0.003	0.272 (0.787)	0.069	4.922 (0.000)
RA	0.076	2.449 (0.021)	0.134	2.852 (0.008)	0.084	1.942 (0.062)	0.046	2.146 (0.040)	0.061	3.310 (0.002)	0.027	2.297 (0.029)
WSF	0.063	2.143 (0.042)	0.146	5.401 (0.000)	0.043	2.429 (0.022)	0.028	1.725 (0.095)	0.031	2.614 (0.014)	-0.006	0.845 (0.405)
WKF	0.124	1.123 (0.272)	0.041	0.260 (0.797)	-0.214	-3.837 (0.001)	0.146	2.290 (0.029)	-0.113	-0.973 (0.339)	0.054	4.285 (0.000)
WEP	-0.064	-1.446 (0.160)	-0.195	-0.878 (0.387)	-0.434	-1.559 (0.130)	0.035	0.427 (0.672)	0.012	0.117 (0.908)	0.134	1.958 (0.060)
Parameters of model quality												
R^2	52.4		67.9		40.1		57.6		56.0		68.6	
F	5.2		8.5		4.9		6.5		6.2		10.2	
p	<0.01		<0.01		<0.01		<0.001		<0.001		<0.001	

* determined indices as in the methods section of the article

Source: own study

3. In 2013, changes can be observed in the factors that drive return on equity in animal feed producers. As shown by the data, financial profitability in 2013 was explained by one variable from the operating area (ratio of cash from operating activities to net sales) and two variables related to financial activity (the financing structure and financial charge ratio). Note that the ratio of cash from operating activities to net sales and the financing structure had a positive impact. In turn, an increase in financial charges had an adverse effect on return on equity.

4. In 2014, more changes could be observed in the factors that drive return on equity in animal feed producers. As shown by the data, that year's ROE was explained by four variables, i.e. all three variables describing the operating area and one variable related to the financial area (the financial charge ratio). All significant variables have positive regression coefficients which suggests the corresponding factors have a positive impact on the explained variable. This means that in 2014, financial profitability of animal feed producers was determined by efficient operations and by a favorable financial leverage effect.

5. In 2015, just like in 2011 and 2012, there were three major drivers of return on equity, i.e. the ratio of cash from operating activities to net sales, the asset turnover ratio and the financing structure. Note that the coefficients of these explanatory variables were positive; this suggests they had a positive impact on the explained variable. This also means that in 2015, the increase in return on equity was driven by growth of the ratio of cash from operating activities to net sales, a faster turnover of total assets, and a favorable financial leverage effect. The parameters of the regression model show that the two first variables characterizing the operating area had a stronger impact. Therefore, it appears that return on equity recorded in that year was determined to a greater extent by the ratio of cash from operating activities to net sales and by the asset turnover ratio whereas the financial leverage effect was of smaller importance.

6. In the last year covered by this analysis (2016), three out of six factors considered proved to have a significant impact on ROE, i.e. two variables describing the operating area and one variable related to the financial area. This means that changes in return on equity were driven by improvements in the cash generation properties of profits, the asset turnover ratio and the financial charge ratio.

SUMMARY

The identification of drivers of financial profitability in enterprises, including animal feed producers, is of major importance in creating value for owners. Based on a six-factor cause-and-effect model, this study was an attempt to capture the determinants of financial profitability of animal feed producers. As a result of the study, the following conclusions were formulated:

1. The models presented in this paper provide a good description of financial profitability of animal feed producers.

2. As shown by the parameters of regression models, variation in ROE experienced by animal feed producers was explained by: the ratio of cash from operating activities to net sales; the return on capital employed; and financing structure. The three factors referred to above generally had a positive impact on financial profitability. This means

that changes in ROE were driven by an increase in cash efficiency, a faster turnover of company assets and a positive financial leverage effect.

3. The share of operating profit in operating cash flow and the indicators of financial charge were demonstrated to be less significant than other significant variables. This could suggest that a reduction in financial charge and an improvement in cash quality were less important in driving return on equity.

4. Throughout the studied period, the tax effect ratio had no significant impact on return on equity.

Based on the above, it may be concluded that in order to improve profitability ratios and, thus, to provide more value to owners and increase the value of the company, managers of establishments producing animal feed should focus their efforts on improving cash management efficiency and asset turnover as well as managing the sources of funding.

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CZYNNIKI DETERMINUJĄCE RENTOWNOŚĆ FINANSOWĄ PRZEDSIĘBIORSTW PRODUKUJĄCYCH PASZE DLA ZWIERZĄT

ABSTRAKT

Rentowność kapitału własnego należy do podstawowych mierników korzyści ekonomicznych właścicieli przedsiębiorstwa. Jej generowanie jest jednym z fundamentalnych warunków kontynuowania i rozwoju działalności przedsiębiorstwa, niezależnie od rodzaju prowadzonej działalności. Głównym celem artykułu jest identyfikacja siły i kierunku wpływu wybranych czynników kształtujących rentowność finansową w przedsiębiorstwach produkujących pasze dla zwierząt. W analizie wykorzystano sześcioczynnikowy model przyczynowo-skutkowy powiązania czynników kształtujących rentowność finansową z trzema sferami działalności przedsiębiorstwa, tj. operacyjną, finansową i fiskalną. Wykorzystano dane finansowe z jednostkowych sprawozdań finansowych przedsiębiorstw produkujących pasze dla zwierząt za lata 2011-2016. Na podstawie wyników analizy regresji wielokrotnej w przekroju czasowym nie można jednoznacznie wskazać czynników trwale oddziaływujących na rentowność kapitału własnego. Można jednak uznać, że głównymi czynnikami wpływającymi na zmiany rentowności kapitału własnego w przedsiębiorstwach produkujących pasze były: wydajność gotówkowa sprzedaży, produktywność zaangażowanego majątku i struktura finansowania. Wskazuje to, że zarządzający przedsiębiorstwami produkującymi pasze, chcąc poprawić rentowność, a tym samym zwiększyć korzyści właścicieli oraz wartość przedsiębiorstwa powinny swoje działania koncentrować na poprawie efektywności w obszarze gospodarki pieniężnej, obrotu posiadanym majątkiem oraz na zarządzaniu źródłami finansowania.

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