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ROLE OF DEBT AND THE ABILITY TO CREATE EQUITY IN A FAMILY FARM

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Abstract
The aim of the work was to assess the dependence between debt level and the creation of equity for the farmer. In this paper were verified the opinions found in literature concerning the positive impact of debt-to-equity farmer. The study was carried out on family farms belonging to the "large" farms according to the classification of the Farm Accountancy Data Network (FADN PL) based on economic size ESU (that is about 45 ESU). The farms were divided into two different groups on account of level their debt. To analyze data were used the descriptive statistics method and regression models. Family farms with a larger level of debt showed better results and the regression models confirmed the positive influence of debt on the ability to create value for farms. This model is consistent when farmers benefit from preferential credit. This form of debt was dominated in the studied farms. The results of the research may constitute an exit point for conducting analysis for farmers considering to take out a loan or credit.

Keywords
debt, financial surplus, equity, value for farmer.

Introduction

One of the more important elements of finance management is the issue within the scope of capital structure formation whose creators are [1] (they were the pioneers in theoretically examining and algebraically demonstrating the effect of capital structure on firm value), as well as its impact on the outcome obtained by business units. Despite its commonness capital structure is defined and understood differently. According to [2, 3] or [4] capital structure is identified with the structure of liabilities, whereas e.g. [5, 6] perceive capital structure in the context of constant capital by separating equity and long-term borrowed capital. This paper discusses capital structure from the point of view of the share of the equity and borrowed capital in financing. Depending on the sector where a business unit operates capital structure may vary, which arises from the access to borrowed capital, range of activity or profitability. In Polish agriculture a dominant role is played by family farms (at least in relation to headcount) that in majority decide to self-finance their activity. According to [7] for this reason a low investment level dominates in these entities. It also leads to development restriction as borrowed financing allows to improve profitability and the financial situation, as well as to decrease costs [7, 8], and thus liabilities may contribute to the growth of equity and increased wealth of farmers. Although a family farm demonstrates some specific features [9, 10], a farmer-owner, a user must take decisions within the framework of his current, investment and financial activity that will contribute to the highest possible benefits for him and his family. However, it is still worth adding that working out the income from the farm will not always contribute to creating equity. Creating equity from the farm will take place when cash flows from operations after deducted borrowed capital costs (financial surplus) are on the level exceeding an alternative cost of equity (discussed in detail further).

The objective of this paper is to assess the situation of family farms in relation to the capability of multiplying equity while considering the debt level. The thesis that debt increase in financing assets contributes to achieving a higher Return on Assets and on equity (since purchasing and selling is realized in cash, cash flow-based rates, i.e. not family farm income-based rates, will be used in the measurement) as well as creating more capital for the farmer has been proposed.

Survey methodology

The research was conducted on family farms that participated in data collection for the needs of the Polish FADN (*Farm Accountancy Data Network*) in the years 2004–2008 and were qualified according to the methodology of Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej [Institute of Agricultural and Food Economics] (the entity responsible for collecting accountancy data within the framework of FADN) as large farms. To avoid excessive differences in relation to equipment with factors of production and to preserve the comparability principle, farms at a business size level of 40-50 European Size Unit (ESU) were subjected to analysis. ESU is a parameter intended for determining the economic size of a farm set on the basis of standard direct surpluses of the farm. One ESU equals to 1200 euro [11].

Farms were divided into smaller groups, which was necessary to meet the objective set. The division criterion was the median of the debt level. Group 1 (g1) included farms with a lower (below median) debt level, whereas group 2 (g2) consisted of the farms that were indebted more (above median debt level). However, there was no division into a short- and long-term debt on account of the insignificant size of externally borrowed short-term financing and thus all farm debts were jointly analysed.

Due to the fact that the circle of interest included only these farms that were able to work out added value for the farmer (contribute to equity creation) only these farms that met that criterion were selected for the analysis. Finally, two groups were created that differed with the debt share in financing assets (Sources of financing and sources of capital are the identified as identical; compare [7, 12–15]).

The literature indicates that the equity engaged in the activity, costs [13, 14]. In case of farms an alternative cost may be the cost of the equity. It is assumed that when a worked-out financial surplus from an operation (in family farms the financial activity takes place at a minimum scope or does not take place at all, thus this type of activity has been ignored as it could cause changes as a result of business activity in terms of operations) is enough to incur alternative costs a family farm is able to generate added value for the farmer, i.e. contribute potentially to the increase of the farm equity value. It is worth adding that the case of a family farm achieving higher added values for the farmer will not necessarily contribute to the increase of the farm equity value as the work-out funds when provided for the family farm are treated as private property of its owner and as such it is not shown in assets. Consequently, it is up to the farmer and mainly to his tendency for saving or investing whether the worked-out funds will return to the farm thus causing equity growth or will be spent on his private needs. However, one may assume that a bigger value of funds gives the farmer more possibilities to increase the farm equity. Calculating the cost of the family farm equity is very complicated due to the lack of information about the level of risk accepted by farmers and accurate information about their financial situation, particularly in relation to results achieved. Calculating the agricultural income is just of estimated character. It is not easy to use the suggested equity calculation methods, of which the most frequently applied one is CAMP [13], for units that are not participants of the capital market and a family farm undoubtedly is one of them. Therefore, it is suggested to use the alternative cost of capital usage as the equity cost in these units. The approach related to potential cashing of the equity and investing it as a long-term deposit seems right. Therefore, in this study it was assumed that the alternative cost (cost of lost possibilities) of the equity constituted an estimated interest of long-term deposits. Such an approach was also used by [16] and [17].

The value for the farmer (VF) calculated with the use of the formula presented below was considered the measure of the farm's capability to increase equity:

$$VF = FS - K_{Kw}, \tag{1}$$

where K_{Kw} – alternative cost of the equity, whereas

$$FS = WDB - K_{cz}, \tag{2}$$

FS – financial surplus, WDB – gross added value, K_{cz} – cost of external factors (the equity, land, labour).

Due to the fact that the value for the farmer calculation basis was the financial surplus that reflects the cash flow balance, VF was treated as the amount of free funds transferred for the farm from the household.

To evaluate the assets' effectiveness (total capital) or the equity, rates of return based on the cal-

culation of the financial surplus (FS) were used and calculated according to the formula:

$$\text{GROA} = \text{FS} : \text{A}, \tag{3}$$

$$\text{GROE} = \text{FS} : \text{Kw}, \tag{4}$$

where GROA – cash return on assets, GROE – cash return on equity, A – total assets (total capital), Kw – the equity, the others – as above.

To check the significance of differences between the created groups a Kolmogorov-Smirnov test for difference in averages for independent variables was conducted. This type was chosen because of the nature of the variables. To confirm the impact of a debt or its lack on the value for the farmer a regression model as follows was prepared:

$$Y = b_0 + b_1x_1 + b_2x_2 + \ldots + b_nx_n, \tag{5}$$

where Y – dependent variable (value for the farmer), $x_1, x_2, \ldots, x_n$ – explanatory variables, b – regression coefficient.

To evaluate the degree of the model adjustment the determination coefficient R^2 and the statistics F was applied. The forward stepwise regression was applied for the regression model. The variables that were taken into consideration included: x_1 – sale, x_2 – direct costs, x_3 – general costs, x_4 – depreciation, x_5 – debt, x_6 – fixed assets, x_7 – current assets, x_8 – advance funds for home.

Estimation of parameters of the model and its diagnostics was carried out with the use of the STATISTICA 10 program.

Characteristics of the surveyed population

Table 1 presents primary data enabling the characteristics of surveyed farms with the division into fixed groups during the survey period.

In accordance with the adopted criterion related to the economic size, the analyzed groups of farms were characterized by similar parameters within this scope. The difference between ESU level was not significant and amounted to ca. 0.5–0.8 depending on the year. As one could expect it was affected by the factors of production a farm had, i.e. land, labour and capital. The area of arable land (AL) in group g1 amounted to ca. 50ha (except for the year 2005) (Table 1). On average the farm from group g2 had at its disposal ca. 79–90 ha AL. Changes within the area resulted from the use of a lease to a lesser or greater extent as the trade of rural land is insignificant in case of family farms.

As far as labour force is concerned the average AWU per a farm amounted to 2.5–3. However, taking into consideration the differences of the usable land it should be stated that the farms from group g2 used labour force more intensively as per unit they "employed" ca. 5 AWU, whereas group g1 – ca. 7 units.

The farms surveyed varied as far as capital equipment was concerned. Farmers that were in g1 used assets worth over 700 thousand Polish zloty for the purpose of their agricultural activity, though it can be observed that in 2005 and 2007 the average decreased by ca. 100 thousand Polish zloty. Such a situation could have been caused by restricting investments or decreasing the value of current assets – particularly of products (the latter referred mainly to 2007 that was a very good year for agriculture).

Such changes were also observed in g2 which despite bigger resources (value of ca. 1 mln Polish zloty) reacted similarly to the changes taking place on the market. In 2006 and 2008 the value of capital increased as an effect of intensified investment processes arising from the possibility of making use of aid programmes prepared for the farming sector after the entry into the European Union. The increasing debt level, irrespective of the group, taking place during these years confirms that farmers incurred bigger outlays on fixed assets. The largest changes within this scope occurred in 2008 as a result of supplementing own contribution by raising credits to purchase fixed assets with funding from the Rural Area Development Programme.

Table 1
Primary information related to the surveyed groups of family farms in the period 2004–2008.

Specification	Years/ groups of farms									
	2004		2005		2006		2007		2008	
	g1	g2	g1	g2	g1	g2	g1	g2	g1	g2
European size unit [ESU]	44.2	45.0	44.2	45,0	44.3	45.0	44.0	44,5	44.3	45.0
Labour resources [AWU*/farm]	2.3	3.0	2.4	3.0	2.5	3.0	2.5	2.6	2.5	3.0
Land [ha AL]	53	72	60	89	54	73	46	72	51	80
Capital [thousand Polish zloty/farm]	722	1.044	667	1.036	702	1,225	584	980	744	1,328
Total debt ration[%]	7.5	25.9	9.3	30.9	9.9	30.6	5.3	25.9	7.8	32.4

* AWU includes all labour resources i.e. own labour and agricultural contract work. AWU equals 2200 hours of work per year. Source: own calculations.

Table 2
Primary statistics for the debt level in surveyed farm groups.

Specification	2004		2005		2006		2007		2008	
	g1	g2	g1	g2	g1	g2	g1	g2	g1	g2
Average	53	299	6	341	72	398	36	315	69	465
Median	56	224	58	255	66	315	28	235	61	370
1Q	17	175	20	207	21	252	6	151	20	270
3Q	84	345	106	420	123	458	66	396	105	515
Standard deviation	37	240	49	221	57	262	32	248	55	275
Coefficient of variation	69	80	75	65	78	65	89	78	79	59

Source: own calculations.

Table 2 presents primary characteristics related to the debt level.

The debt level in selected groups (in accordance with assumptions) varied. Farms from g1 adopted a prudential variant and their debt level amounted to 40-70 thousand Polish zloty depending on the year, which on average per 1ha AL amounted to ca. 800–1400 Polish zloty. Whereas in this group the difference between 1Q and 3Q was from 64 thousand in 2004 to 100 thousand in 2006, which showed that farms in this group were 5 times (majority of years) and even 10 times more indebted nominally than the ones of 3Q. Consequently the coefficients of variation were relatively high in group g1

The debt level of the farms from g2 financing 30% of their assets (table 1) amounted on average to 300–460 thousand Polish zloty which means that per each usable land 4.5–6.5 thousand Polish zloty of borrowed capital was used. That for family farming seems to be quite a large burden. Though there were differences between the set out quartiles in group g2, they were relatively smaller which is confirmed by lower coefficients of variation.

Since the capital usage is related to the costs table 3 compares numerical data concerning the costs of borrowed capital interests and alternative costs of the equity in g1 and g2.

Table 3
Costs of borrowed capital and the equity in set out groups [Polish zloty].

Year	Interests		Cost of the equity	
	g1	g2	g1	g2
2004	1,946.28	2,071.65	30,043.08	26,387.87
2005	2,071.65	8,366.45	33,511.11	29,803.65
2006	1,998.32	8,162.70	28,320.73	37,198.00
2007	1,471.68	7,146.95	26,646.10	32,269.99
2008	2,198.73	11,131.89	30,349.90	38,834.58

Source: own calculations.

The cost of interests in g2 was relatively low compared to g1 in 2004, in the next years the costs of borrowed capital increased in g2, whereas in g1 they dropped. The average interest rate in g1 amounted to ca. 4%; while at a much higher level of borrowed capital the farmers from g2 incurred relatively low costs of its engagement (ca. 2–2.5%). It is to be supposed that owners (users) of farms from g2 used preferential loans more frequently (e.g. with interest subsidies or grace period for interest payment).

The alternative cost of the equity was at a similar level in both analysed groups, whereas the changes in its value varied. In 2004 the farms from g1 incurred higher costs of the equity compared to g2 by 4 thousand Polish zloty. This difference is slight which indicated that farmers had equity of similar value at their disposal. In 2005 g1 showed high costs of the equity engagement which at increasing costs of borrowed capital could suggest the intensification of actions as regards investments with the use of, not only borrowed capital, but also of the farmer's savings from previous years that "returned" to the farm from the household for this purpose. The farmers from g2 also increased their debt in relation to investment needs. Starting from 2006 farmers from g1 increased the nominal value of the debt, which was reflected in the decreasing contribution of the equity and could be indicative of a deteriorating situation as regards working out the equity on a sufficiently high level that would enable the extended reproduction. The situation of farms from g2 looked differently within this scope. After a significant slowdown of the debt growth and the investment process, in 2007 in 2008 both borrowed capitals as well as equity increased as a result of favourable conditions in 2007 and the implementation of actions within the framework of EU aid programmes within the framework of the budget perspective 2007–2013.

Financial situation of the studied groups

As Table 1 shows the set out groups of farms varied not only in terms of the debt level, but also of their resources, particularly of land and capital,

which translated into the achieved economic results. Table 4 presents numbers related to the financial situation of farms from surveyed groups.

Farmers classified in g1 achieved worse results on average than the ones belonging to g2, the reason of which might be the factors of production at the disposal of farmers. It is worth emphasizing at this point that throughout the analysed period the farmers from g2 managed operation-related costs better, which is confirmed by the relation of gross added value and the financial surplus that varied with the value of external factors, including the borrowed capital. Considering that the farmers from g2 used the leased land to a larger extent and to a larger extent financed their assets from external sources thus not incurring significantly higher costs compared to g1, they had to use preferential loans (which was confirmed, as indicated above).

The income earned from a family farm in g1 was lower that the one achieved by the farmers from g2, but the difference decreased from 70 thousand on the gross added value level to ca. 30 thousand Polish zloty in most analysed years (except for the year 2007 where the difference amounted to 60 thousand Polish zloty). Thus it may be supposed that the farms from g2 were characterised by a higher level of tangible assets at disposal which generated a non-pecuniary cost, i.e. depreciation. In almost all years the increase of tangibles assets proceeded similarly regardless of the analysed group, though in 2007 g1 limited investments, whereas g2 making the most of the prosperity for agriculture kept on incurring outlays for this purpose.

The farms from g1 demonstrated a lower added value for the farmer compared to group 2 which was the consequence of achieving worse results. At this point it should be noticed that farms from g2 generated higher costs of the equity only in 2005. In other years a bigger variation within this scope occurred. It was found that the subjects surveyed were equipped to a similar extent with their own labour force, EL area and capital which would indicate that better results of the farms from g2 were the outcome of engaging external financing in an appropriate degree.

The evaluation of capital usage is possible by referring achieved effects expressed by the added value for the farmer to the engaged capital. That is why Table 5 presents figures related to rates of return on asset and equity.

The effectiveness of the assets' usage was similar in all years and amounted to ca. 12–13%. Only in 2004 in g1 did the rate of return not amount to 9%. In 2007 in both groups farmers achieved a higher rate of return by 2–3 percentage points (p.p.) compared to other years. However, as mentioned earlier, this was the result of a very good situation on the market of agricultural products. The results achieved indicate that farms operated with relatively similar earning effectiveness for a farmer (owner, user) from each Polish zloty of engaged capital ca. 12–12% of additional value of free cash (potentially equity). It should be emphasized that in g1 in years 2006 and 2008 farmers achieved a higher return which may be indicative of better use of the equity they owned. The difference was, however, insignificant (ca. 0.5 p.p.). Whereas each equity unit brought the farmers from g2 a return at a level of 20–30% depending on the year. The lowest results were achieved by farmers in 2006 and that was caused by the bigger equity-added value for the farmer ratio which was indicative of worse use of equity (also low GROA achieved in this group in 2006 confirms the above). Rates of return achieved by farmers were at a similar level, but the question was whether the differences were statistically significant. Table 6 presents the results of Kolmogorov-Smirnov test for the following variables: equity, added value for the farmer as well as GROA and GROE.

Table 4
Financial measures in surveyed groups of farms in years 2004–2008 [in thousand Polish zloty].

Specification	2004		2005		2006		2007		2008	
	g1	g2	g1	g2	g1	g2	g1	g2	g1	g2
Sale	284	412	273	361	278	408	273	447	305	397
WDB	145	220	138	204	163	242	165	253	173	243
FS	139	217	128	183	152	215	153	232	158	217
Farm income	102	138	93	121	113	154	118	180	121	159
VF	56	103	74	119	85	147	77	148	85	144

Source: own calculations.

Table 5
Rates of return on assets and equity in surveyed groups of farms.

Specification	2004		2005		2006		2007		2008	
	g1	g2	g1	g2	g1	g2	g1	g2	g1	g2
GROA	8.6	12.1	11.8	13.2	13.2	12.5	14.6	17.8	12.3	11.9
GROE	9.4	32.5	20.9	29.8	15.9	20.7	16.2	22.7	13.8	26.3

Source: own calculations.

Table 6
Diversification for equity, value added for the farmer and rates of return for holdings indicating a various debt level.

Specification	Max. Negative difference	Max. Positive difference	value	N g1	N g2	Significance of differences
2004						
Equity	−0.173	0.099	$p < .10$	121	121	No
VF	**−0.280**	**0.008**	$\mathbf{p < .001}$	**121**	**121**	Yes
GROA	−0.140	0.008	$p > .10$	121	121	No
GROE	**−0.247**	**0.000**	$\mathbf{p < .005}$	**121**	**121**	Yes
2005						
Equity	−0.175	0.056	$p > .10$	116	63	No
VF	**−0.350**	**0.020**	$\mathbf{p < .001}$	**116**	**63**	Yes
GROA	−0.135	0.047	$p > .10$	116	63	No
GROE	−0.212	0.030	$p < .10$	116	63	No
2006						
Equity	**−0.247**	**0.000000**	$\mathbf{p < .001}$	**185**	**106**	Yes
VF	**−0.313**	**0.000000**	$\mathbf{p < .001}$	**185**	**106**	Yes
GROA	−0.077	0.081489	$p > .10$	185	106	No
GROE	**−0.20**	**0.010811**	$\mathbf{p < .01}$	**185**	**106**	Yes
2007						
Equity	−0.134	0.132	$p > .10$	145	144	No
VF	**−0.322**	**0.007**	$\mathbf{p < .001}$	**145**	**144**	Yes
GROA	**−0.169**	**0.014**	$\mathbf{p < .05}$	**145**	**144**	Yes
GROE	**−0.23**	**0.048**	$\mathbf{p < .001}$	**145**	**144**	Yes
2008						
Equity	**−0.288**	**0.028**	$\mathbf{p < .001}$	**175**	**87**	Yes
VF	**−0.247**	**0.000**	$\mathbf{p < .005}$	**175**	**87**	Yes
GROA	−0.023	0.128	$p > .10$	175	87	No
GROE	**−0.180**	**0.011**	$\mathbf{p < .05}$	**175**	**87**	Yes

The differences marked are at the significance level of 0.05. Source: own calculations.

The conducted analysis shows that the set out groups did not indicate statistically significant differences in terms of equity (except for the year 2006 and 2008). The standard deviation that in g2 reached the highest values is worth paying attention to. Rates of return showed differences, in the case of GROA there were no statistically significant differences in surveyed groups, whereas such a diversification occurred in the case of GROE. It can be said that the farms from g1 and g2 used the assets (capital) for conducting their activity with similar effectiveness. On the other hand borrowed capital could positively affect the achievement of bigger profits from equity, the confirmation of which was a significant diversification in terms of the worked out additional value for the farmer. During all the years the added value for the farmer differed significantly in the analysed groups. GROE effects which were achieved by the farmers from g1 and g2 at a significantly different level (higher in g2) also confirmed the positive impact on the value of achieved results.

To test the impact of debt on the level of achieved benefits in the form of the added value for the farmer a correlation analysis was conducted and its results are presented in Table 7.

As for the farms belonging to g1 there was no significant correlation between the surplus and the debt, only in 2008 the situation changed. In case of group g2 there was a statistically significant correlation between the analysed variables except for the years 2005–2006. However, it was not a considerable dependence; still it is worth emphasizing that

it demonstrated a positive character which should be confirmed by regression models.

Table 7
Pearson correlation of the variables: debt and value added for the farmer in the surveyed groups.

Farm groups	Year				
	2004	2005	2006	2007	2008
g1	−0.1	0.1	0.1	0.1	**0.3**
g2	**0.3**	−0.0	0.2	**0.4**	**0.2**

The correlations marked are significant at the level $p < 0.05$. Source: own calculations.

Regression model

Estimated regression models for the groups of farms in consecutive years are presented in Table 8.

It can be concluded from this regression analysis that in almost all analysed years (except for the year 2005) the variable standing for the debt level constituted a stimulant for the added value for the farmer. Some empirical studies show that there is a negative relationship between profitability and leverage [18–20]. However, it related only to the farms from g2, where total debt level constituted ca. 30% of assets belonging to surveyed units and was much higher than in g1. In g1 the debt was not a significant variable in any year and thus was not present in this model. It is obviously hard on this basis to decide whether the debt level achieved by farmers is at the optimal level or not, but that was not the purpose of this work. Still the conducted analysis allowed to verify the thesis proposed at the beginning of this paper about the positive impact of debt on creating value for the farmer. Despite the fact that it was not the purpose of this work to survey the impact of other factors of the value for the farmer it is worth pointing out that the amount of funds transferred to the household turned out to be a stimulant as well.

Table 8
Results of multiple regression.

Group	Estimated regression model	R^2	Statistics F
2004			
g1	$Y = 0.586x_1 - 0.15x_2 - 0.18x_3 - 0.25x_6 + 0.538x_8$	0.66	(8.134) 32.914 $p < 0.000$
g2	$Y = 1.02x_1 - 0.764x_2 + 0.274x_5 - 0.28x_6 - 0.19x_7 + 0.371x_8$	0.60	(7.135) 28.294 $p < 0.0000$
2005			
g1	$Y = 0.674x_1 - 0.24x_2 + 0.430x_8$	0.68	(6.85) 29.317 $p = 0.000$
g2	$Y = 0.376x_1 - 0.29x_2 + 0.637x_8$	0.556	(4.85) 23.287 $p = 0.000$
2006			
g1	$Y = 0.72x_1 - 0.49x_2 + 0.205x_7 + 0.396x_8$	0.74	(6.137) 65.888 $p < 0.000$
g2	$Y = 1.22x_1 - 0.41x_2 - 0.23x_3 + 0.407x_4 + 0.173x_5 - 0.51x_6$	0.77	(7.137) 65.502 $p < 0.0000$
2007			
g1	$Y = 0.838x_1 - 0.23x_2 - 0.09x_7 + 0.358x_8$	0.89	(6.138) 187.191 $p < 0.0000$
g2	$Y = 2.30x_1 - 1.7x_2 - 0.22x_3 + 0.207x_5 + 0.231x_8$	0.91	(6.137) 220.904 $p < 0.0000$
2008			
g1	$Y = 0.56x_1 - 0.68x_2 + 0.112x_7 + 0.478x_8$	0.75	(4.126) 94.933 $p < 0.0000$
g2	$Y = 0.921x_1 - 0.16x_2 - 0.62x_3 + 0.18x_4 + 0.236x_5 + 0.357x_8$	0.81	(4.126) 87.927 $p < 0.0000$

Coefficients next to x are significant at the level p¡0.05. No absolute term was introduced into the equation in the situation when it was significantly insignificant at the significance level 5%. Source: own calculations.

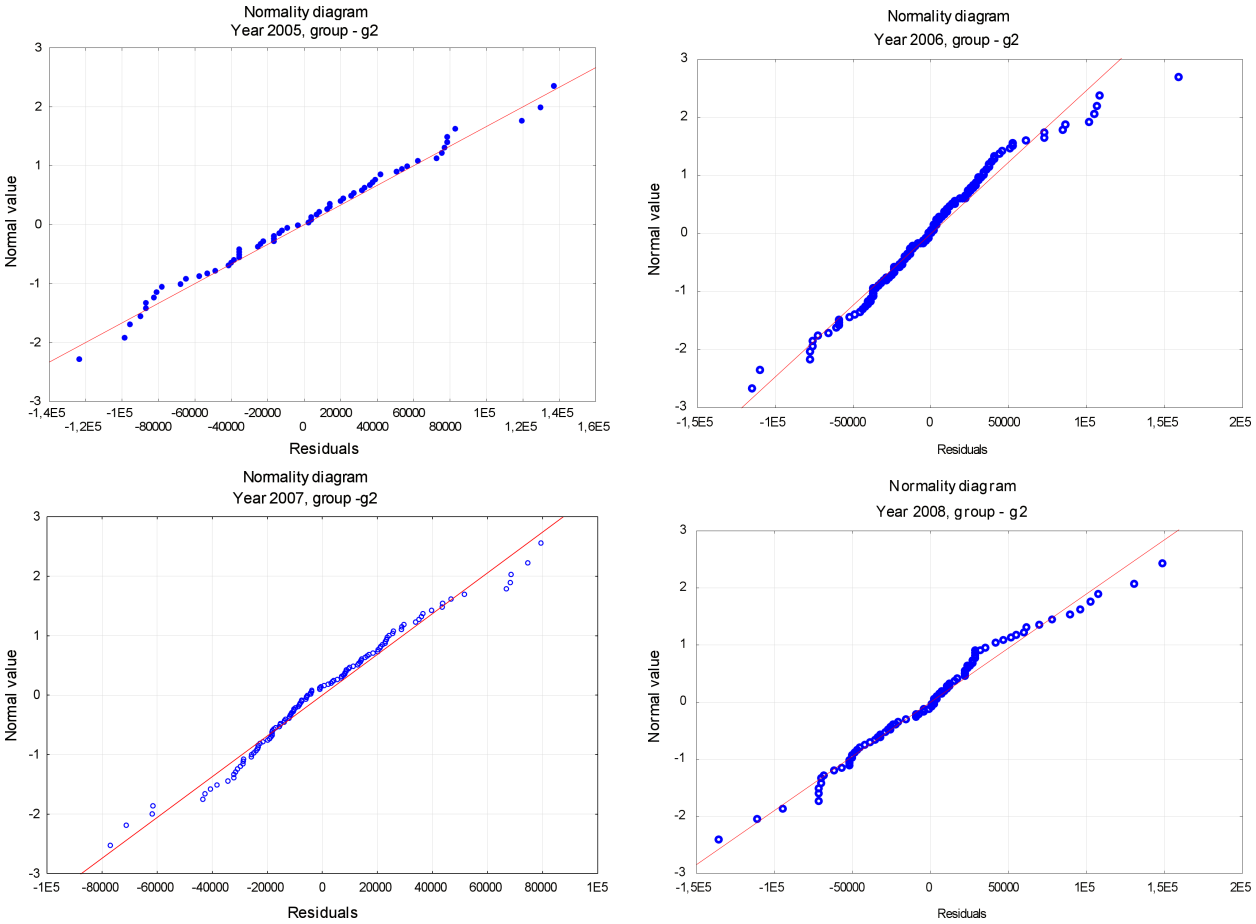

Fig. 1. Distribution of residuals for models of g2 in years 2005–2008. Source: own calculation.

The conducted diagnostics of estimated models indicates that they explain the variance of the added value for the farmer (y) within 65–90% which shows that in the periods where R^2 demonstrated lower values (year 2004–2005) of a depended variable other variables exerted influence. Despite this the model is correct from the formal and substantive point of view. The value of statistics F indicating a small risk of significant relation between variables confirms the correctness of the model conditioning. While from the analysis of residuals it can be concluded that they demonstrate the normal distribution which may be the evidence of the correctness of estimated models. Due to the number of models on Fig. 1 the diagrams of residual distribution for models were developed for g2 in 2005–2008.

Conclusion

An assessment of the family farms' ability to create equity in units which were similar on account of their economic size (ESU) but varied with regards to their level of debt, was conducted in this article. Thus, a positive affect of financial leverage on polish family farming was attempted to be proven. The formulated regression models unequivocally show the positive influence of debt on the ability to create value for the farmer. This of course does not mean that increasing the debt guarantees the achievement of success, for it is worth noting that those farms which did not use outside capital were also able to create value for the farmer, albeit at a lower level. Farmers with a higher loan were able to obtain such a positive influence on their debt by way of better business cost management and attractive credit conditions. Therefore, if the possibility to take out a loan at preferential rates exists, farmers should take advantage of it. This is because through additional financing more favourable effects can be obtained. This is confirmed by the significant difference, between the groups studied, in the size of the cash return on equity (GROE) variable. However, in Polish family farming, the decision to become indebted is rather caused by a huge aversion to risk than by economic reasons and this is the main obstacle to a higher level of development for family farms.

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