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DETERMINANTS OF VARIATIONS IN FIRM-LEVEL PERFORMANCE DETERMINANTY KOLÍSANIA VÝKONNOSTI NA PODNIKOVEJ ÚROVNI

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The evaluation of firm performance does not lose its importance. It is often discussed research topic not only in economics, but also in strategic management, accounting and finance. According to different resources, there are many reasons for heterogeneity in firm performance. Our paper investigates the determinants of profitability on a sample of agricultural enterprises farming in Slovakia over the period 1997–2005. In the first part of the paper, we bring a brief overview of existing studies dealing with performance of agricultural production units. Later on we focused on evaluation of size, market share, gearing ratio, and liquidity impact on the profitability.

Key words: firm performance, profitability, agricultural enterprises

Profitability of firms in transition countries is still a widely discussed topic. Many authors evaluate the factors affecting profitability of firms. The goal of this paper is to contribute to the ongoing debate. The paper investigates the role of previous year's profit, total assets, market share, liquidity, and the gearing ratio in explaining current profitability. We use regression analysis on a sample of 111 agricultural enterprises selected by random choice.

In industrial economics, the Structure – Conduct – Performance paradigm expects a causal relationship between market share and profitability. According to this approach, firms with a stronger market power tend to carry out anti-competitive strategies, enabling them to earn abnormal profit. On the other hand, firms that have already large market share may have achieved this by being more innovative or efficient in the past (Eckard, 1995; Davies and Lyons, 1996). In other words, the positive association between market share and profitability may be based on the positive association between productivity, efficiency, and firm size. The more efficient is the firm, the higher profits it earns, and this enables the firm to grow and expand on the market. However, this is not the case of agricultural enterprises, and market share of a single farmer or agricultural enterprise is in most of the cases insignificant.

Slade (2004) also reviews the relationship between market share and profitability from both a theoretical and an empirical perspective. However, he was using the data on Korean manufacturing industries for 2002 and not the agricultural ones. Yoon (2004) finds a negative relationship between market growth and profitability, and between concentration and profitability; and positive relationships between expenditures on advertising and research and development, and profitability. The analysis by Epstein of allocation efficiency of cooperatives in the region around St Petersburg revealed that both the lack of (qualified) workers and insufficient capital (access) are the critical obstacles to businesses reaching an adequate level of profitability.

The question about the relationship between market share and profitability is closely related with the effort to find an "optimal farm size" of the firm. This quest has a long history in agricultural economics. When land reform strategies were

being formulated at the very beginning of transition some argued that it was desirable to preserve large farm structures and impede farm fragmentation because the smaller farms are less efficient. These authors tended to see restitution strategies, where they would lead to farm structures returning to the pre-war pattern of small-scale peasant units, as highly undesirable (Kanchev, 2000). According to this approach the large farms have been seen to have advantages rising from economies in using lumpy inputs, better administrative organization, better marketing, access to credit and research and development (Hill and Brookes, 1993). In contrast, others argued that the large farms in Eastern Europe suffered from diseconomies of scale, so that land reform strategies must lead to reducing the mean size of farms (Koester and Striewe, 1999). Some of the authors come out from the fact that the agricultural sector in Western Europe, the USA, and other developed countries is dominated by relatively small family farms, while in Central and Eastern European Countries (CEEC) and Former Soviet Union (FSU) the situation is quite different. Here the dual structure of farms exists represented by the large corporate farms (CF) on one hand and relatively small family farms (FF) on the other one. The difference can be seen also in the average farm sizes, where in CEEC and FSU the farm size is significantly higher than in Western Europe or the USA. Literature from the 1990s predicted that the large cooperative farms in CEEC and FSU would transform into family farms and the farm structure in CEEC would become similar to that in Western Europe and the USA because FF are more efficient than CF. However, this transformation has not occurred (Ciaian, Pokrivcak and Drabik, 2007).

Bachev's (2006) results proved the relationship between the farm size and its performance. "A larger operational size gives cooperatives a great opportunity for the efficient use of labour (teamwork, division and specialization of work), farmland (cultivation in big consolidated plots, effective crop rotation), and material assets (exploration of economy of scale/scope of large machinery). In addition, they have superior potential to minimize market uncertainty ("risk pooling", advertisement, storing, integration into processing and marketing), to organize critical transactions (accessing credit; negotiating positions in input supply/marketing; facilitating land

consolidation through lease-in and lease-out deals; technological innovations), and to invest in intangible capital (reputation, labels, brand names)".

According to Goddard et al. (2005) there is consistent evidence of a negative size – profitability relationship. While the formation of the Single Market enabled successful firms to expand along geographic and product lines, this growth may have had negative implications for profitability. In contrast, the relationship between market share and profitability is consistently positive, and stronger in manufacturing than in services.

The literature on economies of scale proved that there is not a uniform, cross-national optimum farm size. In the Czech Republic there appear to be economies of scale for arable farming up to 750 ha, in Slovakia economies of scale persist above 2000 ha, while in Hungary diseconomies of scale appear to set in above 500 ha. In Poland, van Zyl et al.'s (1996) analysis indicates that farms which are relatively large by Polish standards (above 15 ha) were, on average, less efficient for the year of study (1993) than their smaller counterparts.

The strategic management sources underline the importance of internal resources of the firm as the determinants of variations in their profitability. They stress that the internal resources that can be or tangible (financial and physical factors of production) or intangible (knowledge, licensees, goodwill) stand behind the firm performance. According to the resource-based view, the main factors that determine the firm performance are the organizational structures and management practices. (Prahalad and Hamel, 1990; Winter, 2003)

The Persistence Of Profit approach (POP), derives from contributions by Mueller (1977, 1986), examines the time-series behavior of profitability at firm level. The approach is based on the main hypothesis that all the temporary extra high or extra low firm's profit rates are corrected through the effects of (potential and actual) entry and exit from the market. The competition on the market is sufficiently strong tool ensuring that no firm persistently earns an above average or below average profit rate. Equilibrium in the conventional sense may never be achieved, however, because each period brings with it new random shocks.

The accounting and finance literature try to explain the variations in profitability and firm performance by examining the financial indicators such as return on equity, assets or sales, liquidity and capital structure of the firm. (Lipe and Kormendi, 1994; Baginski et al., 1999; Callen, 2001)

Beside all the factors influencing the firm profitability from inside, Rugman and Verbeke argue that the performance of firms is very much influenced by factors specific to the country in which each firm is located, for several reasons. "First, even after controlling for distance and market size, trade within national borders tends to exceed cross-border trade by a large factor. Second, aggregate savings and aggregate investment at national level are highly correlated, suggesting that domestic savings is the main source of finance for domestic investment, and most capital does not cross national borders in pursuit of the highest return. Third, the equity portfolios of investors tend to be biased in favor of home country stocks, and investors appear to be reluctant to diversify their portfolios geographically. Fourth, resource endowments, financial and technological infrastructures, institutional and regulatory frameworks, openness to international trade and access to international markets in driving foreign direct investment and the creation and diffusion of knowledge are all factors that affect the competitive environment." (Rugman and Verbeke,

2004) The role of state seemed to be an important factor influencing the firms' profitability especially before joining the EU. Slovak agricultural enterprises farming in worse production conditions were given higher state support and thanks to this fact their earned profit per hectare of agricultural land was relatively high, while the ones farming in regions appropriate for intensive farming faced tougher competitive conditions in the market (Ciaian et al. 2001). Since 2004 the agricultural businesses in Slovakia receive support in compliance with the rules of Common Agricultural Policy of the EU and respective regulations. This includes support to the domestic and foreign market, direct payments and subsidies to rural development measures. Additional national specific payments are provided and these are not supported by CAP EU (Sojkova et al., 2007).

Data and methodology

To investigate the determinants of firm-level profitability, we used the empirical model proposed by Goddard (2005) tested on five large European countries: Belgium, France, Italy, Spain and the UK.

$$PROF_{i,t} = \alpha_0 + \alpha_1 PROF_{i,t-1} + \beta_1 ASSET_{i,t} + \beta_2 SHARE_{i,t} + \beta_3 GEAR_{i,t} + \beta_4 LIQ_{i,t} + \eta_i + \nu_{i,t}$$

where, the dependent variable – profitability of firm i in year t is $PROF_{i,t}$, measured as net profit before tax plus interest divided by total assets (ROA). We expect the close relationship between $PROF_{i,t-1}$ and achieved current profitability, as the abnormal profit has a tendency to persist from year to year. $ASSET_{i,t}$, the natural logarithm of total assets, shows possible relationship between firm size and profitability. If firms gain economies of scale as they expand, then we expect a positive relationship between size and profitability. $SHARE_{i,t}$ presents

Table 1 General characteristics of analysed set of enterprises

Factor (1)	Number of enterprises (2)	Share in % (3)
Legal form (4)		
Co-operative (5)		
Limited liability company (6)		
Joint-stock company (7)		
Total number (8)		
Soil and natural conditions (9)		
Better soil and natural conditions (10)		
Worse soil and natural conditions (11)		
Total number (8)		
Size groups (12)		
Small enterprises (13)		
Medium enterprises (14)		
Large enterprises (15)		
Total number (8)		

Source: own calculations

Zdroj: vlastné výpočty

Tabuľka 1

Celková charakteristika analyzovaného súboru podnikov (1) faktor, (2) počet podnikov, (3) podiel v %, (4) právna forma, (5) družstevná, (6) spoločnosti s ručením obmedzeným, (7) akciové spoločnosti, (8) spolu, (9) pôda a prírodné podmienky, (10) lepšia pôda a prírodné podmienky, (11) horšia pôda a prírodné podmienky, (12) veľkostné skupiny, (13) malé podniky, (14) stredné podniky, (15) veľké podniky

Table 2 Descriptive statistics

Indicator (1)	1997	1998	1999	2000	2001	2002	2003	2004	2005
PROF (2)	0.040	0.035	0.031	-0.001	0.074	0.050	-0.017	0.048	0.044
ASSET (3)	98 438	19 5336	11 1007	129 208	125 565	159 762	176 164	235 926	179 276
SHARE (4)	0.0017	0.0033	0.0067	0.0063	0.0016	0.0034	0.0059	0.0045	0.0028
GEAR (5)	1.214	0.982	2.447	2.381	0.271	3.539	1.399	1.196	1.392
LIQ (6)	1.765	1.749	2.365	1.578	1.779	2.020	1.309	1.880	2.032

Source: own calculations

Zdroj: vlastné výpočty

Notes: All values are sample means. $PROF_{i,t} = (\text{Profit before tax} + \text{Interest paid}) / \text{Total assets}$, in %. $ASSET_{i,t} = \text{Total assets}$ (in thousand SKK). $SHARE = \text{Sales of the firm on the total sales in the sector}$, $GEAR_{i,t} = \text{Gearing} = \text{Non-current liabilities plus loans} / \text{Shareholder funds}$. $LIQ_{i,t} = \text{Liquidity ratio} = (\text{Current assets} - \text{Stock}) / \text{Current liabilities}$

Tabuľka 2 Deskriptívna štatistika

(1) indikátor, (2) zisk pred zdanením + zaplatené úroky / celkové aktíva v %, (3) celkové aktíva v tis. SKK, (4) obrat firmy k celkovému obratu v sektore, (5) „Gearing“, iné ako bežné záväzky plus pôžičky / vlastné imanie, (6) ukazovatele likvidity (bežné aktíva – zásoby) / bežné záväzky

Table 3 Estimated coefficients

	$PROF_{t-1}$ (1)	ASSET (2)	SHARE (3)	GEAR (4)	LIQ (5)
Coefficients (6)	0.2514	-0.0100	-0.0083	0.0003	0.0528
t-stat (7)	16.2804	-5.8044	-0.8507	17.257	56.9243
P-value (8)	0.0391	0.1086	0.5112	0.0360	0.0112

Source: own calculations

Zdroj: vlastné výpočty

Tabuľka 3 Odhadované koeficienty

(1) zisk pred zdanením + zaplatené úroky / Celkové aktíva v %, (2) celkové aktíva v tis. SKK, (3) obrat firmy k celkovému obratu v sektore, (4) „Gearing“, iné ako bežné záväzky plus pôžičky / Vlastné imanie, (5) ukazovatele likvidity (bežné aktíva – zásoby) / Bežné záväzky, (6) koeficienty, (7) t-štatistika, (8) P-hodnota

the market share, the sales of firm as a proportion of total industry sales. As the studied group of enterprises consists of agricultural farms, where the total number of farms is huge and the share of sales of a farm on the total industry sales is negligible, we do not expect any relationship between market share and profitability. $GEAR_{i,t}$ represents the gearing ratio measured as the non-current liabilities plus loans divided by shareholder funds. We expect a positive relationship between the gearing ratio of the firm and profitability. $LIQ_{i,t}$ is the liquidity ratio, measured by current assets net of stock divided by current liabilities. According to our expectation, if a firm holds too high proportion of its assets in a liquid form, this may constrain its ability to use profitable investment opportunities. That is why we expect the relationship between firm liquidity and profitability to be negative. η_i controls for all cross-sectional (between firms) variation in profitability. The model was tested on a sample of 111 agricultural enterprises selected by random choice over the period 1997–2005.

Following legal forms were included in the group of analysed enterprises: co-operatives, limited liability companies and joint-stock companies while the major part of these enterprises was co-operatives (56 %). As seen from the table 1, the group of enterprises includes the enterprises of all sizes farming in different soil and natural conditions, so we consider it to be a representative sample.

Results and discussion

The estimation results for agricultural enterprises farming in Slovakia are reported in the Table 3. The explained variability represented by a coefficient of determination is 0.9372. The coefficient for $PROF_{i,t-1}$ is significant and our assumption that the profit has a tendency to persist from year to year was proved. This hypothesis was proved also in other studies. All of the estimated coefficients on $ASSET_{i,t}$ indicate a negative

size-profit relationship, however, this relationship is not statistically significant. We expected that the relationship between the amount of total assets and profitability will be positive. This hypothesis was rejected. According to our results, expansion can have negative implications for profitability, as the expansion within a firm's existing market may be met with increasing rivalry from its competitors. The regulatory authorities may make it difficult for firms to expand. (See also Penrose, 1959; Marris, 1964)

The estimated coefficients on $SHARE_{i,t}$ are negative and statistically insignificant. The studied group of enterprises consisted from agricultural farms, where the total share of sales of a farm on the total industry sales is negligible, so we did not expect any relationship. Our assumption that there is no causal relationship between market share and profitability was proved. The estimated coefficients on $GEAR_{i,t}$ indicate positive and significant relationship between a firm's gearing ratio and its profitability. The possible explanation is that the profitable enterprises have had a better access to bank credits; therefore they show a higher gearing ratio than the non-profitable ones. This hypothesis was proved. The estimated coefficients on $LIQ_{i,t}$ indicate a positive and significant relationship between the firm's liquidity ratio and profitability. Benito and Vlieghe (2000) also find that low liquidity is connected with a low profitability for around one-third of their sample firms. However, our assumption about negative relationship between profitability and liquidity ratio was not proved. It seems that highly liquid enterprises have the flexibility to adapt rapidly to changing circumstances which has a positive effect on profitability.

Conclusions

The goal of this paper was to contribute to the ongoing debate. The paper investigates the role of previous year's profit, total assets, market share, liquidity, and the gearing ratio in explaining current profitability. We use regression analysis on a

sample of 111 agricultural enterprises selected by random choice. In the first part of the paper, we brought a brief overview of existing studies dealing with performance of agricultural production units. Later on we focused on evaluation of size, market share, gearing ratio, and liquidity impact on the profitability. According to our results the estimated coefficient for $PROF_{i,t+1}$ is significant and our assumption that the profit has a tendency to persist from year to year was proved. The estimated coefficients on $SHARE_{i,t}$ are negative and statistically insignificant. Our assumption, that there is no causal relationship between market share and profitability was proved. The estimated coefficients on $GEAR_{i,t}$ indicate positive and significant relationship between a firm's gearing ratio and its profitability. This hypothesis was proved. The estimated coefficients on $LIQ_{i,t}$ indicate a positive and significant relationship between the firm's liquidity ratio and profitability. Our assumption about negative relationship between profitability and liquidity ratio was not proved.

Súhrn

Hodnotenie výkonnosti podnikov nestráca svoju dôležitosť. Je to často diskutovaná téma výskumu nielen v oblasti ekonómie, ale aj strategického manažmentu, účtovníctva a financií. Rôzne zdroje uvádzajú veľa dôvodov heterogenosti výkonnosti firmy. Tento príspevok uvádza výsledky výskumu determinantov výkonnosti, vykonanom na vzorke poľnohospodárskych podnikov hospodáriacich na Slovensku počas obdobia 1997–2005. V prvej časti príspevku podávame stručný prehľad existujúcich štúdií, ktoré sa zaoberajú výkonnosťou produkčných jednotiek v poľnohospodárstve. Ďalej sa sústreďujeme na hodnotenie vplyvu veľkosti, podielu na trhu, „gearing“ pomeru a likvidity na ziskovosť podniku.

Kľúčové slová: výkonnosť podniku, ziskovosť, poľnohospodárske podniky

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