doi: 10.17221/325/2015-AGRICECON

Factors determining the financial structure of Czech and Slovak agricultural enterprises

Lenka KALUSOVA*, Peter BADURA

University of Economics in Bratislava, Bratislava, Slovak Republic

*Corresponding authors: kalusova.lenka1@gmail.com

Kalusova L., Badura P. (2017): **Factors determining the financial structure of Czech and Slovak agricultural enterprises.** Agric. Econ. – Czech, 63: 24–33.

Abstract: The financial structure of enterprises is constantly a subject of research of many academics. Despite the fact that many scientific studies deal with this area of financial management, the research is mostly focused on industrial companies. In our opinion, there is a wide scope for research into the segment of agricultural enterprises and their financial structure, as well. The aim of the paper is, therefore, to analyse the direction and intensity of action of the selected internal corporate factors and external factors of the macro-environment on the financial structure of Czech and Slovak agricultural enterprises and to identify differences in the action of these factors between the Czech and Slovak companies. The methods of multiple regression and correlation analysis have been used as the main research methods. The achieved results pointed at the fact that in addition to the internal corporate factors, the external factors of the macro-environment were also statistically highly significant for certain groups of agricultural enterprises. The paper also points to some differences in the direction and intensity of action of the chosen factors on the examined level of debt – the total indebtedness and the credit indebtedness of the studied agricultural enterprises.

Keys words: comparison, external factors of macro-environment, indebtedness of agricultural enterprises, internal corporate factors

After the Czech and Slovak Republic have joined the European Union on 1st May 2004, both countries have adopted the Common Agricultural Policy, as well. Despite the operation of the Common Agricultural Policy and the impression of creating a uniform economy, there are some researches proving that there is a considerable variance among the productivity, the technological level as well as the market integration of agricultural enterprises in different EU countries (Blaas 2008). Also Ďuričová and Chrastinová (2010) refer to some differences in Czech and Slovak agriculture. The mentioned differences are mainly due to the natural conditions in which the enterprises operate. The dependence on natural conditions is different not only at the level of the individual countries, but also within the countries. This was confirmed by Chrastinová's research (2008). Different natural and climatic conditions in which Czech and Slovak agricultural enterprises operate affect the production possibilities of these companies. In this paper, we will focus on the comparison of factors affecting the financial structure of Czech and Slovak agricultural enterprises.

There are numerous studies and researches dealing with the property and financial structure[1] of agricultural enterprises (Nurmet 2001; Hacherová and Szovics 2002; Szabo and Grznár 2002; Janda and Čajka 2006). The examination of the factors influencing the property and financial structure on a sample of Czech agricultural enterprises was the research subject of

The work is a creative output of the grant task of the VEGA 1/0004/13 Recent Trends and Methods of Financial Management and Their Impact on Enterprise Financial Stability and Young Teachers', Researchers', and Ph.D. students' grant under the registration number I-15-104-00 Comparison of factors determining the financial structure of Slovak and Czech enterprises and their impact on financial stability of these enterprises.

[1]Since some authors define financial and capital structure in different ways and one group even considers these concepts being the same, in our paper under the term "financial structure" we understand the structure of the total financial sources which finance the enterprise activities.

doi: 10.17221/325/2015-AGRICECON

Aulová and Hlavsa (2013). The research was focused on the impact of internal corporate factors on the financial structure of these companies. The research results point to the fact that the most important determinants of the financial structure of Czech agricultural enterprises are the size of the company, the structure of assets, profitability and liquidity. The attempts to design the financial structure optimization model of Czech dairy farms can be found in Chmelíková's study (2002). As reported by the author herself, such a unified model of optimization cannot be made, because by changing the proportion of debt in the financial structure, considerable disparities can be found in the financial health of these dairy farms. It is, therefore, necessary to examine each company individually. In the Slovak Republic, the determinants of the property and financial structure in the field of agriculture had been studied by Baloghová and Hacherová (2009). The authors found out that the amount of profit achieved influences the level of the current trade liabilities and bank loans.

The main objective of this paper is the analysis and quantification of the factors determining the possibilities of shaping the financial structure of Czech and Slovak agricultural enterprises. The aforementioned factors are divided on the basis of their internal logical connections into two separate groups – internal corporate factors and external macro-environment factors in which the studied enterprises conduct their business activities. We assume that the difference in the Czech and Slovak macroeconomic environment is also reflected by the intensity, respectively even by the direction of action of the selected factors on the possibilities for shaping the financial structure of Czech and Slovak agricultural enterprises.

MATERIAL AND METHODS

The financial statements required for this study have been obtained from the Cribis database (concerning the Slovak enterprises) and from the Albertina (as for the Czech enterprises). We have chosen a number of selection criteria for selecting the companies. The primary criterion was the affiliation of enterprises to the industry - we have used the SK NACE (CZ NACE) A –Agriculture, forestry and fishing, Groups 01.1 – Growing of non-perennial crops, 01.2 – Growing of perennial crops, 01.4 – Livestock breeding and 01.5 – Mixed farming. Further, from all these companies, we have selected just the legal entities – business companies (i.e. the legal form of joint- stock companies and limited liability companies). We have analysed the years 2009–2014[2], so our further condition was the date of legal incorporation – up to 31st December 2008.

By setting the criteria for the studied enterprises and after the exclusion of companies whose financial statements were incorrect, our total sample group consisted of 2199 Czech and 798 Slovak agricultural enterprises.

The direction and intensity of the selected factors influence on the financial structure of the surveyed agricultural enterprises were analysed by the multiple regression analysis model:

$$MZ_{it} = \beta_0 + \beta_1.GDP_t + \beta_2.HICP_t + \beta_3.i_t + \beta_4.tax_t + \beta_5.ROA_{it} + \beta_6 size_{it} + \beta_7 liq_{it} + \beta_8.AsSt_{it} + \beta_9.risk_{it} + \beta_{10}.NDTS_{it} + \beta_{11}.age_{it} + \varepsilon_{it,} \quad (1)$$

where

MZ = selected debt ratio of the sample of enterprises
i = number of enterprises in the sample
t = specifically analysed period
β_0 = the intercept parameter
$\beta_1 - \beta_8$ = regression coefficients
independent variables: GDP – GDP growth, *HICP* – harmonized inflation rate, *i* –interest rate, *tax* – tax rate, *ROA* – gross return on assets, *size* – logarithm of revenues reflecting the size of the enterprise, *liq* – liquidity, *AsSt* – assets structure, *risk* – risk level of the company, *NDTS* – non-debt tax shield, *age* – the number of years since the company's establishment to the observation date
ε_{it} = random errors.

Dependent variables

The financial structure is represented by the indicators of indebtedness. That is the reason why in the model of the regression analysis the indebtedness rate of the studied agricultural enterprises acts as the dependent variable. In our research, we decided to test the impact of selected variables on the total indebtedness (designed as borrowed capital to total assets), the long-term indebtedness (long-term borrowed funding sources to total assets), the credit indebtedness (bank loans to total assets) and the

[2]At the time of processing the analytical part of the paper, there have not been available the financial statements of all studied enterprises as of 2014, so at some companies, the analysis has been carried out only for the period 2009–2013.

doi: 10.17221/325/2015-AGRICECON

Table 1. The summary of the studied determinants of financial structure and the way of their expression

Independent variables	Indicator	Expected impact of the factor	Researches that confirm the direction of expected impact of the factor
Economic cycle	GDP growth	+	Frank and Goyal 2004; Yeh and Rocca 2010
Inflation	HICP	–	Demirgüç-Kunt and Maksimovic 1998; Clayman et al. 2008
Interest rate	Average interest rates on loans to enterprises	+	Vlachynský et al. 2009; Bokpin 2009
Corporate tax rate	(EBT – net profit)/EBT	+	Krištofík 2002; Bauer 2004
Profitability	Profit before tax/total assets	–	Rajan and Zingales 1995; Nivorožkin 2004; Bokpin 2009
Size of a company	Natural logarithm of turnover	+	Nguyen and Ramachandran 2006; Hailu et al. 2007
Liquidity	Current assets/short term liabilities	–	Ramalho and da Silva 2009; Moosa and Li 2012
Assets structure	Tangible fixed assets/total assets	+	Jõeveer 2006; Heyman et al. 2008
Business risk	Taffler model	–	DeAngelo and Masulis 1980; Titman and Wessels 1988
Non-debt tax shield	Depreciation/total assets	–	Sogorb-Mira 2005; Režňáková et al. 2010; Ameer 2013
Age of the company	The number of years since the company's establishment to the observation date	–	Klapper et al. 2002; Jensen and Uhl 2008

Source: own processing

long-term credit indebtedness (long-term bank loans to total assets).

Independent variables

When selecting the factors which, as we assume, affect the financial structure of the examined Czech and Slovak agricultural enterprises, we based our selection on a study of numerous domestic and foreign researches dealing with the issue of factors determining the financial structure of enterprises. The aforementioned factors are generally divided into two main groups – the external macro-environment factors and internal corporate factors. The summary of the studied determinants as well as the way of their expression is listed in Table 1.

RESULTS AND DISCUSSION

At this point, we would like to point out the specifics and differences in the financial structure of Czech and Slovak agricultural enterprises. Table 2 indicates the average indicator values of the total, long-term, credit, and long-term credit indebtedness of the studied enterprises divided by sectors.

Concerning the total indebtedness of the sample of enterprises in all four groups, it is evident that the Slovak agricultural enterprises are significantly more indebted than the Czech ones (e.g. while a median Slovak company in the group of mixed farming has only 30% share of own funding sources to the total funding sources, which are used to cover the property, in the event of the median Czech enterprise, this number is twice as high, i.e. the equity ratio is 60%). In the case of the Slovak sample of enterprises, it is not unusual that the total indebtedness exceeds 100%, i.e. a considerable part of Slovak agricultural companies is over- indebted. The over- indebtedness of these enterprises is often caused by the long-term recurring losses that gradually reduce the amount of equity until the accumulated losses do eventually exceed own funds of the company, so they have to be covered by the external funding sources as well. In the case of Czech agricultural enterprises, compared to the Slovak ones, the financial situation appears to be more consolidated, not only as for the level of the total debt, but in particular concerning the debt structure. By looking at the total long-term indebtedness of Slovak enterprises, it is obvious that a crucial part of the debt consists of short-term external funding sources (e.g. the long-term indebtedness of

doi: 10.17221/325/2015-AGRICECON

Table 2. The average values of debt indicators in the analysed sample of enterprises as for the year 2013 in %

Indicator	SK			CZ			SK			CZ		
	total indebtedness						long-term indebtedness					
Sector	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3
Growing of non-perennial crops	43.91	71.74	91.8	19.19	50.18	79.08	0.06	6,38	20.61	0.00	4.22	28.22
Growing of perennial crops	67.72	85.63	98.63	32.98	53.02	87.24	0.00	0,46	17.24	0.01	4.3	26.64
Livestock breeding	48.13	68.73	87.3	22.78	59.16	90.48	0.31	7,57	20.61	0.02	1.39	26.71
Mixed farming	48.72	70.26	91.27	20.52	39.52	65.79	0.16	6,21	25.53	1.78	13.32	30.41
Indicator	credit indebtedness						long-term credit indebtedness					
Sector	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3
Growing of non-perennial crops	0.00	0.00	11.7	0.00	1.12	18.8	0.00	0.00	0.17	0.00	0.00	6.22
Growing of perennial crops	0.00	0.00	0.00	0.00	0.00	22.84	0.00	0.00	0.00	0.00	0.00	1.94
Livestock breeding	0.00	1.81	18.71	0.00	0.00	24.58	0.00	0.00	3.71	0.00	0.00	0.00
Mixed farming	0.00	0.00	11.45	0.00	8.97	20.4	0.00	0.00	0.00	0.00	4.8	14.51

Note: Q1 – lower quartile; Q2 – median; Q3 – upper quartile

Source: own processing

a median company in the group of mixed farming is only 6%, which at 70% of total indebtedness means that the enterprises are almost completely financed by short-term funds). This way of financing may cause significant liquidity problems to Slovak enterprises. Czech agricultural enterprises are doing significantly better – e.g. the long-term indebtedness of a median company in the group of mixed farming is at the level of 13% (while the total indebtedness is 40%), i.e. nearly one third of external funds are the sources of long-term nature.

Differences between Czech and Slovak agricultural enterprises can also be found in the area of the credit and long-term credit indebtedness. Czech enterprises included in the sample use the bank loans as a source of financing at a significantly higher rate, but, nevertheless, we have to conclude that bank loans in general are not a common way of financing, neither in the Czech nor Slovak agricultural enterprises. Even the median enterprises in all groups of Slovak companies (with the exception of breeding livestock) and Czech median companies in groups of growing perennial crops and breeding livestock do not use this source of funding. Matoušková (2009) indicates production riskiness and a lower credit rating of agricultural enterprises as the main reason for the low use of bank loans by this business segment. As other reasons for the low use of bank loans, especially the long-term ones, there are given the high loan interests and the prioritization of the short-term loans by banks (Ševčíková 2000).

In the case of Slovak agricultural enterprises, we can conclude that the structure of funding sources is not optimal. As stated by Sovíková (2013), Slovak enterprises have difficulties to cope with indebtedness – e.g. in 2012 the level of a median Slovak enterprise flow indebtedness reached 23, which means that it would take 23 years while a median Slovak enterprise could pay off its debts (the recommended value for this parameter is up to 3 years).

What could we indicate as the main reasons of that inappropriate structure of external financing sources of Slovak agricultural and industrial enterprises? As the main reason, we consider the *strict requirements and credit standards of banks* due to their precautions and the need to respect their capital adequacy. Enterprises fail to fulfil the strict requirements and as a result, they cannot obtain a bank loan. As stated by Markovič et al. (2013), obtaining loans by enterprises without sufficient own funds and creditworthy assets that might serve as a collateral is considerably difficult.

Before the examination of the selected factors' impact on the corporate financial structure, it was necessary to determine whether among the factors (which we expect to influence the dependent variable), there is not a strong positive, respectively negative correlation, i.e. whether the factors are independent on each other. As a strong dependence, we consider the correlation coefficient greater than 0.8 in the absolute amount. At this point, we present in the Table 3 the correlation matrix for the group of enterprises engaged in growing non-perennial crops.

The correlation matrix for other groups of Czech and Slovak enterprises is not stated in the paper. The

doi: 10.17221/325/2015-AGRICECON

Table 3. The study of the relationship tightness among the independent variables in the group of growing non-perennial crops in the Slovak sample of enterprises

	GDP	HICP	i	tax	ROA	size	liq	AsStr	risk	NDTS	age
GDP	1.0000										
HICP	–0.1094	1.0000									
i	0.0198	–0.0042	1.0000								
tax	–0.0145	–0.0077	–0.0082	1.0000							
ROA	0.0124	–0.0199	–0.0005	0.0025	1.0000						
size	–0.0274	–0.0132	0.0250	0.0174	0.0288	1.0000					
liq	–0.0125	–0.0187	0.0023	–0.0028	0.0110	–0.1757	1.0000				
AsStr	–0.0353	0.0155	0.0496	–0.0160	0.0397	0.0827	–0.1359	1.0000			
risk	–0.0025	0.0134	0.0017	–0.0037	0.6495	–0.0227	0.3384	–0.0796	1.0000		
NDTS	–0.0103	0.0256	–0.0002	–0.0017	–0.6949	–0.0137	–0.0064	–0.0408	–0.6369	1.0000	
age	–0.1569	–0.3118	–0.0173	0.0232	–0.0029	0.0456	0.0649	–0.0394	0.0175	0.0049	1.0000

Source: own processing

testing results of the relations' tightness among the different variables in all groups show that there are not any that would be strongly dependent on each other.

The summary of the selected factors' direction and intensity on the financial structure of the studied Czech and Slovak agricultural enterprises is presented in Table 4 and 5. There are also presented the coefficients of these factors and their statistical significance.

In the case of the long-term indebtedness and total indebtedness, the results point to interesting findings about the differences in the direction and intensity of factors both among the sectors and the countries as well. As we can see in Table 4, the impact of external factors of the macro-environment is lower than the impact of the internal corporate factors.

In the context of *external macro-environment factors,* concerning the total and the long-term indebtedness, a positive impact of the economic cycle on the indebtedness of Slovak enterprises has occurred only in the group of growing perennial crops. There is a positive correlation, i.e. with the growth of the Slovak economy, also an increase in the indebtedness of Slovak enterprises has been detected. In our view, given that the major part of the total indebtedness of Slovak enterprises consists of short-term debt, an increase of indebtedness during an economic boom is caused mainly by an increase in the short-term external funding. As a statistically significant factor (in the group of the macro factors), there has also turned out to be the impact of the tax rate on the total and long-term indebtedness of Czech enterprises in the group of growing non-perennial crops. However, it has been more interesting to analyse the impact of interest rates on the indebtedness of the studied agricultural enterprises. The influence of the interest rates has reflected in two ways – a negative correlation has been observed in the group of planting non-perennial crops, while a positive correlation has been observed in the Slovak enterprises' group of growing perennial crops and in the Czech enterprises' group of livestock breeding and mixed farming. Enterprises with a positive correlation between interest rates and their indebtedness seem to take advantage of the positive impact of the interest tax shield.

The *internal corporate factors* seem to have a much stronger impact on the financial structure of agricultural enterprises. By analysing the operating direction of factors on the Czech and Slovak companies, we found out that this direction was mostly identical. An exception is the effect of the non-debt tax shield on the total indebtedness of Czech and Slovak agricultural enterprises in almost all groups. In the case of Slovak enterprises, we can observe a negative correlation, i.e. with an increase in the non-debt tax shield (i.e. with an increasing proportion of depreciation to the total assets), the indebtedness of the studied companies' declines. This result is in accordance with our expectations and research results of other foreign studies (Sogorb-Mira 2005; Ameer 2013). We assumed previously that the increasing proportion of depreciation to the total assets should lead to higher tax savings (because the depreciation is a tax-deductible cost) and thus as a result of these savings, the generated net profit would be higher as well. This should lead to the increase of own financial sources. In the case of Czech enterprises, the results show a positive correlation between the non-debt tax

doi: 10.17221/325/2015-AGRICECON

shield and indebtedness. This fact can be explained in a number of ways. At first, the benefits arising from the non-debt tax shield can only be exploited by those enterprises that were able to generate a sufficient amount of funds during the financial year. If enterprises cannot exploit these advantages, the depreciation only increases the total costs and reduces the reported economic results, resulting in a decrease of own funds and the related increase of external funding. On the other hand, if enterprises do benefit from the non-debt tax shield, that leads to an increase in their net income and they could obtain external funding sources more easily. As they achieve better economic results, other entities do incline more to provide them with external funds. So by increasing the profitability of these enterprises, the debt ratio in the financial structure raises as well.

The structure of company assets is statistically highly significant factor both for the Czech and for the Slovak agricultural enterprises. A strong positive correlation occurred mainly in the long-term indebtedness. Long-term tangible assets can serve as collateral when trying to obtain long-term loans, and, therefore, with the raising share of long-term tangible assets, also the increase of indebtedness happens. Our results are consistent with the research results of Heyman et al. (2008) and Jõeveer (2006).

According to the results of our research, the statistically highly significant factors, which are negatively correlated with indebtedness of the studied Czech

Table 4. Summary of the direction and intensity of the analysed factors on the total and long-term indebtedness of the studied enterprises

Independent variable	Growing of non-perennial crops		Growing of perennial crops		Livestock breeding		Mixed farming	
	SK	CZ	SK	CZ	SK	CZ	SK	CZ
Total indebtedness								
GDP	−0.4088	0.0299	3.6880**	−1.1183	−0.7388	−0.4588	0.0462	−0.1296
HICP	−0.0313	−0.6810	−2.4518	−0.0876	−0.2778	−1.4704	0.5099	0.3812
i	−0.0006**	−0.0008	−0.0116	0.0027	0.0000	0.0017	−0.0001	0.0115***
tax	0.0001	−0.0144**	−0.0199	−0.0265	−0.0026	−0.0083	−0.0006	−0.0086
ROA	−0.5873***	−0.3327***	−0.7589***	−0.0036	−1.0015***	−0.4158***	−0.4159***	−0.1856***
Size	−0.0588***	−0.0460***	−0.0436**	−0.0171	−0.0413***	−0.0079	−0.0196***	−0.0721***
Liq	−0.0096***	−0.0005***	−0.0036***	−0.0005***	0.0000	−0.0007***	0.0000	−0.0006***
AsStr	0.0530	0.1774***	0.0821	0.6404***	−0.1088*	0.2076***	0.1667***	0.0763***
Risk	−0.0044	−0.0122***	0.0037	−0.0009	−0.0012*	−0.0019	−0.0027***	−0.0023***
NDTS	−0.6494***	0.9516***	0.0795	−1.0743**	−0.5131***	0.6106***	−0.0105	0.4217***
Age	−0.0006	−0.0065***	−0.0290	−0.0187***	−0.0150*	−0.0117***	−0.0092	−0.0039***
Adj. R^2	0.1759	0.1700	0.4958	0.1262	0.1914	0.1883	0.0767	0.1415
Long-term indebtedness								
GDP	−0.1442	−0.1916	−0.1156	−0.1634	−0.3965	−0.3663	−0.6401*	−0.2740
HICP	0.8487**	−0.3263	1.77	−0.9726	0.2119	−1.1592	−0.5992	−0.7092
i	−0.0004***	0.0027	1.3092***	0.0006	0.0000	0.0021***	0.0000	0.0045***
tax	0.0001	−0.0101*	−0.0128	0.0066	0.0006	−0.0005	0.0002	−0.0016
ROA	−0.0363	−0.1112***	0.0466	−0.0009	−0.0874	−0.0329	−0.0310	−0.0612***
Size	0.0001	−0.01430**	−0.0024	0.0142	−0.0183**	−0.0113	−0.0027	−0.0018
Liq	0.0034***	−0.0001**	0.0003	0.0001	0.0000	−0.0001**	0.0000	0.0000
AsStr	0.2975***	0.19807***	0.1510**	0.3122***	0.1944***	0.2825***	0.2449***	0.1796***
Risk	−0.0128***	−0.0060***	−0.0020	0.0047**	−0.0004	−0.0032**	−0.0001	−0.0008**
NDTS	−0.0506*	0.0436	0.4934	0.4514*	−0.5080***	0.2711**	−0.0823	0.2036***
Age	0.0073	0.0040**	0.0319*	−0.0068***	−0.0108	−0.0036	−0.0122***	0.0024***
Adj. R^2	0.1316	0.0593	0.1296	0.1361	0.0375	0.0628	0.0736	0.0520

*** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at 10% level

Source: compiled by authors

doi: 10.17221/325/2015-AGRICECON

and Slovak agricultural enterprises, are profitability, size, liquidity, risk level and age of the company. Some results are in line with our assumptions. We expected that the increase of profitability would lead to the decrease in indebtedness because the enterprises could generate a sufficient amount of own funds for their financing. We also assumed a negative correlation between the risk level and indebtedness. The capital lenders can examine the financial situation of enterprises, so in the case of their poor creditworthiness the lenders simply would not lend them any money. Inconsistent with our assumptions is the size of the enterprise. As for the company size, the available professional literature and scientific studies (Rajan and Zingales 1995; Hall et al. 2000; Polavková 2000) often indicate that bigger enterprises are more indebted than the smaller ones. The results of our study for Czech and Slovak agricultural enterprises indicate the reverse situation, i.e. there is a negative correlation between the size and the indebtedness of the companies. We believe that a lower share of external funding sources in bigger companies is due to the fact that these companies are in the process of growth and, over time, they can generate and accumulate more own financial sources, which are then used to fund the companies, so they are not dependent on the use of external funding.

Among the factors affecting the total and credit indebtedness of Czech and Slovak agricultural enterprises, there can be found some slight differences.

Table 5. Summary of the direction and intensity of the analysed factors on the credit and long-term credit indebtedness of the studied enterprises

Independent variables	Growing of non-perennial crops		Growing of perennial crops		Livestock breeding		Mixed farming	
	SK	CZ	SK	CZ	SK	CZ	SK	CZ
Credit indebtedness								
GDP	−0.2865	0.0914	0.2230	−0.2496	−0.3020	−0.1710	0.0640	−0.0896
HICP	0.4443*	0.4055	0.2990	0.0944	0.3893	0.2128	0.2389	0.2363
i	−0.0001	−0.0125***	0.2980**	−0.0100***	0.0000	−0.0011***	−0.0001	−0.0127***
tax	0.0028***	−0.0023	0.0025	0.0073	0.0026	0.0023	0.0000	−0.0014
ROA	−0.0205	−0.0235**	−0.0032	0.0000	−0.0216	−0.0053	−0.0120	−0.0030
Size	0.0133***	0.0223***	0.0090**	0.0179***	0.0189***	0.0233***	0.0017	0.0232***
Liq	−0.0007	0.0000	−0.0001	0.0000	0.0000	0.0000	0.0001	0.0000
AsStr	0.0439***	0.0900***	−0.0178	0.0994***	0.0308*	0.0834***	0.0730***	0.0913***
Risk	−0.0011	−0.0010	0.0005	−0.0013	−0.0001	0.0000	−0.0004	−0.0003
NDTS	−0.0239	0.6650***	0.0609	0.0166	−0.0836	0.1282***	0.0554	0.2934***
Age	−0.0048	−0.0025***	−0.0019	−0.0016	−0.0060**	−0.0012**	−0.0077***	−0.0018***
Adj. R^2	0.0400	0.1399	0.0906	0.1092	0.074	0.0861	0.0328	0.1439
Long-term credit indebtedness								
GDP	−0.2899**	−0.0207	−0.0733	−0.0712	−0.1879	−0.0637	−0.1052	−0.0662
HICP	0.5710***	0.3159	−0.0582	0.3119	0.4463***	−0.3162	0.1873	0.0583
i	0.0000	−0.0066***	0.1335***	−0.0057***	0.0000	−0.0005***	0.0000	−0.0078***
tax	0.0003	−0.0007	0.0012	−0.0021	0.0004	0.0024	0.0000	−0.0020
ROA	−0.0189*	−0.0050	−0.0019	0.0002	−0.0190	0.0083	0.0002	0.0012
Size	0.0044**	0.0216***	0.0030*	0.0074*	0.0045**	0.0139***	−0.0002	0.0232***
Liq	−0.0001	0.00003*	0.0000	0.0000	0.0000	0.0001**	0.0000	0.00003***
AsStr	0.0495***	0.0798***	0.0028	0.0968***	0.0352***	0.0535***	0.0447***	0.0850***
Risk	−0.0002	−0.0002	0.0001	−0.0005	0.0000	0.0000	−0.0001	0.0000
NDTS	−0.0210*	0.0331	−0.0702*	0.0000	−0.0772**	0.0548*	0.0107	0.1439***
Age	−0.0092***	−0.0012***	0.0005	0.0000	−0.0104***	0.0005	−0.0080***	0.0000
Adj. R^2	0.0638	0.0936	0.0714	0.0835	0.095	0.0843	0.0339	0.1725

*** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at 10% level.

Source: compiled by authors

doi: 10.17221/325/2015-AGRICECON

Table 5 presents the statistical significance of factors determining the total credit and long-term credit indebtedness.

The decisive factors influencing the total credit indebtedness and long-term credit indebtedness, concerning the macro-environment factors, are especially inflation and the level of interest rates. From the internal corporate factors, there are mostly important the size of the company, the structure of assets, the non-debt tax shield and the duration period of company's existence.

The inflation is a statistically highly significant factor especially for the long-term credit indebtedness of Slovak agricultural enterprises in the groups of growing non-perennial crops and livestock breeding. However, the interesting finding is that the inflation does not affect the credit indebtedness of the studied Czech enterprises at all. On the contrary, concerning the Czech enterprises, a significant factor has proven to be the level of interest rates, which is negatively correlated with the credit indebtedness (high interest rates lead eventually to a decrease in credit funding because the price is simply too high).

In the case of the internal corporate factors, the structure of assets is statistically a highly significant factor in almost all of the studied groups (with the exception of growing non-perennial crops in Slovakia). Although the structure of assets has shown to be a significant factor also for the total debt, the significance of this factor in the credit indebtedness has raised even more. Enterprises operating in the agricultural sector are generally regarded by banks as relatively high-risk companies due to their specifications, and, therefore, the banks also require sufficient collateral. Especially the long-term tangible assets are mainly used as collateral, so this factor is statistically highly significant in the case of credit indebtedness.

In addition to the assets structure, the other statistically highly significant factors are the non-debt tax shield, the age and size of enterprises. The direction of action of the non-debt tax shield and the age of enterprise is consistent with the direction of action of the total indebtedness, so at this point, we will focus only on the effect of the company size. As a matter of fact, regarding the company size, we can observe a dual direction of action, depending on the selected dependent variable. We have found a negative correlation between the total indebtedness and the size of the company, i.e. an increase in the size category of the enterprise is accompanied by a decrease of the enterprise indebtedness. Regarding just the credit indebtedness, our research proves a positive correlation – that is, an increase in the size category leads also to the increase in the credit indebtedness of the enterprise. The positive correlation between the company size and its credit indebtedness is also indicated in the study of Jensen and Uhl (2008). The indicated positive correlation can be explained by the precaution of banks in providing bank loans – bigger companies tend to have more diversified business activities than the smaller ones. That means a reduced risk through the diversification of business and, therefore, the bigger companies appear to be less risky for the banks. Simultaneously, the bigger companies have a greater volume of assets that can be used as a collateral to get a loan.

CONCLUSION

Our research results point to several interesting facts in the financial structure of Czech and Slovak agricultural enterprises. Our aim was to analyse the factors that affect the financial structure of these enterprises and to look for differences in the action of these factors between the countries. At the very beginning of the study, we found out that there were significant differences in the structure of funding sources of Czech and Slovak agricultural enterprises. We also found out that the financial condition of Czech enterprises appeared to be more consolidated than the financial condition of Slovak enterprises. Slovak agricultural enterprises are struggling with a high indebtedness and an inappropriate structure of external funding sources (a decisive share of liabilities consists of short-term funds, while the share of long-term external funds is minimal). Such high level of indebtedness, in conjunction with the low share of long-term financial sources, requires paying more attention to ensuring the solvency of those Slovak enterprises.

The main contribution of this paper is the study of the influence of the external macro-environment factors (the impact of the economic cycle, inflation level, interest rates and tax rates) on the financial structure of Czech and Slovak agricultural enterprises. In our study of the sample group of enterprises, we have found out that not only the corporate factors should be analysed, but attention ought also to be paid to the external factors of the country in which the enterprises operate (the impact of several macro-environment factors on the indebtedness of the studied agricultural enterprises proved to be highly

doi: 10.17221/325/2015-AGRICECON

statistically significant). So, in shaping the financial structure the agricultural enterprises are also affected by factors of the macro-environment in which they operate. The significance of this finding is, in our opinion, particularly important because the enterprises cannot affect significantly the level of these factors. The factors have to be taken as some sort of limits within which the enterprises must plan the structure of their funding sources.

Based on the analysis of the factors that affect the financial structure of enterprises, it can be stated that there are some differences both in the intensity, as well as the direction of their effect. While on the one side we do not find significant differences between the Czech and Slovak agricultural enterprises (and even among individual groups of enterprises) concerning the profitability, company size, liquidity and asset structure, on the other side, we found a different direction of action concerning the non-debt tax shield or interest rates.

Despite the fact that the number of studies concerned with analysing the factors that influence the financial structure of agricultural enterprises is not high, a certain degree of consistency can be observed comparing the results of our research (as for the internal corporate factors) with the results of other studies. The same conclusions about the effect of profitability and the company size on the financial structure of agricultural enterprises were indicated by Prášilová (2012). The results of her research, however, and unlike our conclusions, they show a negative correlation between the proportion of tangible assets to the total assets and the total indebtedness. The confirmation of the negative impact of the company size and the positive impact of the asset structure on the total indebtedness can also be found in the research of Simonovska et al. (2012). The differences in the results of the aforementioned studies may be due to the number and characteristics of the sample of enterprises, as well as the environment in which the enterprises operate.

REFERENCES

Ameer R. (2013): Financial liberalization and firms' capital structure adjustments evidence from Southeast Asia and South America. Journal of Economics and Finance, 37: 1–32.

Aulová R., Hlavsa T. (2013): Capital structure of agricultural businesses and its determinants. Agris on-line Papers in Economics and Informatics, 2. Available at http://ageconsearch.umn.edu/bitstream/152688/2/agris_on-line_2013_2_aulova_hlavsa.pdf (accessed Apr, 2015).

Baloghová B., Hacherová Ž. (2009): Determinanty majetkovej a kapitálovej štruktúry podnikov agrorezortu. Acta Oeconomica et Informatica, 1: 15–19.

Bauer P. (2004): Determinants of capital structure – empirical evidence from the Czech Republic. Czech Journal of Economics and Finance (Finance a uver), 54: 2–21.

Blaas G. (2008): Kam smeruje ekonomika slovenského poľnohospodárstva: Komparatívna analýza trendov v EÚ-15 a na Slovensku. Ekonomika poľnohospodárstva, 4: 4–12.

Bokpin G.A. (2009): Macroeconomic development and capital decisions of firms – Evidence from emerging market economies. Studies in Economics and Finance, 2: 129–142.

Clayman M.R., Fridson M.S., Troughton G.H. (2008): Corporate Finance. A Practical Approach. John Wiley & Sons, Inc. New York.

DeAngelo H., Masulis R. (1980): Optimal capital structure under corporate and personal taxation. Journal of Financial Economics, 8: 3–30.

Demirgüc-Kunt A., Maksimovic V. (1998): Law, finance, and firm growth. The Journal of Finance, 6: 2107–2137.

Ďuričová I., Chrastinová Z. (2010): Podpora poľnohospodárstva a rozvoja vidieka na Slovensku. Ekonomika poľnohospodárstva, 2: 3–12.

Frank M.Z., Goyal V.K. (2004): Capital structure decisions: which factors are reliably important? Financial Management, 1: 1–37.

Hacherová Ž., Szovics P. (2002): Assets and financial situation in the companies of agricultural primary production in Slovakia. Agricultural Economics – Czech, 48: 353–357.

Hailu G., Jeffrey S., Goddard E. (2007): capital structure, firm size and efficiency: the case of farm petroleum and animal feed co-operatives in Canada. Agricultural Finance Review, 2: 279–293.

Hall G., Hutchinson P., Michaelas N. (2000): Industry effects on the determinants of unquoted SMEs capital structure. International Journal of the Economics of Business, 3: 297–312.

Heyman D., Deloof M., Ooghe H. (2008): The financial structure of private held Belgian firms. Small Business Economics, 3: 301–313.

Chmelíková G. (2002): Possibilities and limits for capital structure optimalising model design of Czech diary industry. Agricultural Economics – Czech, 48: 321–326.

Chrastinová Z. (2008): Economic differentiaton in Slovak agriculture. Agricultural Economics – Czech, 54: 536–545.

doi: 10.17221/325/2015-AGRICECON

Janda K., Čajka M. (2006): Podpora zemědělského úvěru na Slovensku a v České republice Ekonomický časopis, 54: 139–153.

Jensen N.S., Uhl F.T. (2008): Capital Structure in European SMEs – An Analysis of Firm – and Country Specific Variables in Determining Leverage. Available at http://pure.au.dk/portal/files/3244/Capital_Structure_in_European_SMEs.pdf (accessed June, 2015).

Jõeveer K. (2006): Sources of Capital Structure: Evidence from Transition Countries. Working paper series 2/2006, CERGE-EI, Charles University, Prague.

Klapper L.F., Sarria-Allende V., Sulla V. (2002): Small and Medium-size Enterprise Financing in Eastern Europe. Available at http://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-2933 (accessed June, 2015).

Krištofík P. (2002): Determinanty kapitálovej štruktúry a finančného rozhodovania v podmienkach slovenských podnikov. Ekonomický časopis, 50: 197–216.

Markovič P., Tóthová A., Kubranová M. (2013): Finančný manažment na prahu 21. Storočia. Vydavateľstvo EKONÓM, Bratislava.

Matoušková E. (2009): Východiská a dopady súčasnej globálnej hospodárskej krízy v odvetví agropotravinárstva. Nová ekonomika, 2: 48–56.

Moosa I., Li L. (2012): Firm-specific factors as determinants of capital structure: evidence from Indonesia. Review of Pacific Basin Financial Markets and Policies, 15: 1–17.

Nguyen T.D.K., Ramachandran N. (2006): Capital structure in small and medium-sized enterprises: the case of Vietnam. ASEAN Economic Bulletin, 2: 192–211.

Nivorožkin E. (2004): The dynamics of capital structure in transition economies. Economics of Planning, 37: 25–45.

Nurmet M. (2011): Financial Structure of Agricultural Firms. Management theory and studies for rural business and infrastructure development, 25: 187–193.

Polavková J. (2000): Faktory pôsobiace na mieru zadlženosti slovenských podnikov. Ekonomický časopis, 48: 349–368.

Prášilová P. (2012): Determinanty kapitálové struktury českých podniků. E + M Ekonomie a management, 15: 89–104.

Rajan R.G., Zingales L. (1995): What do we know about capital structure? Some evidence from international data. Journal of Finance, 50: 1421–1460.

Ramalho J.S., da Silva J.V. (2009): A two-part fractional regression model for the financial leverage decisions of micro, small, medium and large firms. Quantitative Finance, 9: 621–636.

Režňáková M., Svoboda P., Polednáková A. (2010): Determinants of capital structure: empirical evidence from Slovakia. Ekonomický časopis, 58: 237–250.

Simonovska A., Gjosevski D., Campos M. (2012): Capital Structure and Financial Performance of Agricultural Companies – Evidence from the Macedonian Agricultural Sector in Transition. Available at http://www.researchgate.net/publication/258926510_CAPITAL_STRUCTURE_AND_FINANCIAL_PERFORMANCE_OF_AGRICULTURAL_COMPANIES__EVIDENCES_FROM_THE_MACEDONIAN_AGRICULTURAL_SECTOR_IN_TRANSITION (accessed June, 2015).

Sogorb-Mira F. (2005): How SME uniqueness affects capital structure: Evidence from a 1994–1998 Spanish data panel. Small Business Economics, 25: 447–457.

Sovíková, D. (2013): Vývoj finančnej situácie slovenských podnikov v období rokov 2000–2012. In: Ekonomika, financie a manažment podniku VII: Zborník vedeckých statí pri príležitosti Týždňa vedy a techniky. Vydavateľstvo EKONÓM, Bratislava.

Szabo Ľ., Grznár M. (2002): Dotácie a efektívnosť v agrárnom sektore. Ekonomický časopis, 50: 971–988.

Ševčíková M. (2000): Ekonomické nástroje agrárnej politiky a ich vplyv na vývoj poľnohospodárstva. Zemědělská ekonomika, 46: 207–212.

Titman S., Wessels R. (1988): The determinants of capital structure choice. Journal of Finance, 43: 1–19.

Vlachynský K. et al. (2009): Podnikové financie. Iura Edition, Bratislava.

Yeh H.H., Roca E. (2010): Macroeconomic Conditions and Capital Structure: Evidence from Taiwan. Available at http://core.ac.uk/download/pdf/6611819.pdf (accessed April, 2015).

Received on November 10, 2015
Accepted on December 8, 2015
Published online on November 3, 2016