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MULTIFACTOR PRODUCTIVITY ANALYSIS IN THE SAMPLE OF AGRICULTURAL ENTERPRISES

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Abstract

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The assessment of Total Factor Productivity (TFP), i.e. inclusion of all factors of production seems to be an easy task. However, its calculation can meet with some difficulties. The calculation of inputs is complicated as different factors of production, which are processes to outputs, has to be transformed to a common factor. The aim of the paper was to analyse relations of efficiency of factors of production measured by factor productivity based on economic profit and returns (profitability) of enterprise measured by the most synthetic profitability indicator (Return on Assets, ROA). A partial aim was to consider risk analysed through ratio of cost to capital (Weighted Average Cost of Capital – WACC) performed in the sample on agricultural enterprises in 2004–2008. The database used for the research consisted of 622 agricultural enterprises. The methodology of calculation was based on an approach according to Neumaierová and Neumaier (2002) considering the economic profit. This methodology suits well to conditions of Czech financial statements (a balance sheets and a profit and loss statement). The TFP assessment was connected to the return on assets and the correlation analysis revealed dependences of calculated indicators. The paper is a part of the MSM 6007665806 research project.

Total Factor Productivity (TFP), Weighted Average Cost of Capital (WACC), Return on Assets (ROA), efficiency of production factor, correlation analysis, farms

Productivity is represented by efficiency of production factors use in production. It connects inputs and outputs to a single measure and assesses the production of the economy or enterprise more precisely than the output indicators (indicators of production, added value, yields). It reflects differences of the development of size and intensity of inputs and outputs.

The theory of the role of each production factors in creating an output was developed by Jan Tinbergen (1942) and Robert Solow (1957) in connection to knowledge of production function features in growth accountancy that has been further discussed (Jílek, Moravcová, 2007).

Productivity is applied to all enterprises both manufacturing and non-manufacturing as the production in a broader meaning is the change of inputs to useful outputs (products, services). Productivity is given by the ratio of outputs and inputs in any period.

$$productivity = \frac{outputs}{inputs} \quad (1)$$

This relation reveals that productivity can be increased:

1) by an increase of outputs within the same inputs;
2) by a decrease of inputs while keeping the same outputs;
3) by an increase of outputs and a decrease of inputs which will result into the most significant productivity increase (Synek, 2004).

According to the scale of inputs, partial and total productivity is distinguished (Synek, 2007). Total productivity is crucial; however regarding complicated conversion of the influence of different forms of non-living labour to total productivity, the

analysis of partial productivities is important as well. Factors of production include labour, material, energy consumption as well as often marginalized capital consumption. Total factor productivity (TFP) can be expressed as efficiency of the shift of inputs to outputs; i.e. as the following ratio (Synek, 2007):

$$\frac{output}{sum\ of\ source\ inputs} = \frac{output}{labour + capital + energy + material}. \quad (2)$$

It is possible to calculate the impact of input productivity change to the profit of an enterprise. The calculation should be based on an elimination of an influence of prices and an influence of changes in the production volume. A predicative value of the indicator is related to the way of defining the labour input and its quality.

The aim of productivity indicators is to measure the efficiency of factors of production use. The growth rate of productivity is influenced by the growth rate of outputs and inputs. Productivity is possible to be measured by a number of differently defined indicators. Their use depends on the aim of measurement and data availability. The assessment of productivity is often narrowed to assessment of labour productivity only. This approach is obviously incorrect as it accents only one factor of production (labour consumption). The output (product) is influenced by a number of factors of production so that there are a number of possible calculations. Main productivity measures are overviewed in table I.

Different approach of production factors productivity is based on economic profit and designed for Czech financial statements as date sources according to Neumaierová and Neumaier, 2002. An enterprise efficient enough must meet the following condition: $\frac{Output}{Input} > 1$. Any revenue item of the profit and loss statement can be considered as outputs. Any cost item of the profit and loss statement, i.e. all costs needed to reach revenues as well as the weighted average cost of capital (WACC) is considered as inputs. The WACC is not included in the profit and loss statement so that it is necessary to calculate it and multiple all financial sources (i.e. equity + bank loans + bonds) by its rate to get the absolute value of capital cost. Cost interests have to be eliminated from accountancy cost as they are included in capital cost (they would be included twice).

Total factor productivity (TFP) is given as:

$$TPF = \frac{revenue}{cost - interest + tax + tax\ shield + (WACC \times (E + BL + BD))} \quad (3)$$

in which

revenue.....refers to all revenue item of the profit and loss statement;
cost.....refers to all cost item of the profit and loss statement;
tax.....refers to income tax of the profit and loss statement;
tax shield ...refers to interest expense and tax rate;
WACC .....refers to the weighted average capital cost rate (e.g. in Valach, 1991); capital cost is calculated as opportunity cost according to the INFA model methodology;
E+BL+BF....refers to equity, bank loans and bonds.

In this respect, the TFP is an alternative to the EVA (Economic Value Added) index as the following relation applies (Neumaierová, Neumaier, 2002):

$$EVA = EAT - E^* = revenue - cost - E^* = revenue - economic\ cost \quad (4)$$

in which:

r_e ..... opportunity cost of equity
EAT ..... earning before faxes.

Finally, the TFP is given as:

$$TFP = \frac{revenue}{economic\ cost}. \quad (5)$$

This construction of productivity measure best matches to the traditional requirements of operational management as well as to new

I: *Overview of main productivity measures*

Type of output measure	Type of input measure			
	Labour	**Capital**	**Capital and labour**	***Capital, labour and intermediate inputs (energy, material, services)***
Production	Labour productivity (based on gross output)	Capital productivity (based on gross output)	Multifactor productivity (based on gross output)	KLEMS multifactor productivity
Value added	Labour productivity (based on value added)	Capital productivity (based on value added)	Multifactor productivity (based on value added)	-
	Single factor productivity measures		***Multifactor productivity measures***	

Source: Measuring Productivity. Measurement of aggregate and industrial level productivity growth. OECD Manual. Paris, 2001

requirements of process management, lean manufacturing management and asset management. It reflects both the efficiency of consumption and commitment of factors of production (as well as economic loss due to commitment of related financial funds) and it is possible to be efficiently analysed the level and development of economic value added (EVA) and meeting objectives of an enterprise (Novotná, Volek, 2008).

The INFA system of indices, which also uses this TFP model, is a benchmark diagnostic system of financial indices created by Inka and Ivan Neumaier. It allows assessing within interrelations so that strengths and weaknesses of an enterprise are signalized. To assess the efficiency of an enterprise, the estimate of opportunity cost of equity (), which is a part of the WACC, is the most important. The best solution would be to obtain the value of at capital market however; this is unreal in case of agricultural enterprises so that the value has to be estimated. In the INFA model, opportunity cost of equity is obtained through a build up model based on the sum of a risk-free rate and risk margin.

METHODOLOGY

In the paper, an original database of 622 agricultural enterprises created within the MSM 6007665806 research project was used. Financial statements (balance sheets; profit and loss statements) for 2004–2008 were included in this database. The structure of enterprises shows table II.

The TFP was calculated according to Neumaierová and Neumaier, 2002 – see Formula 3. The calculation of the WACC uses a build-up model according to the INFA methodology available at www.mpo.cz website to set equity costs. (). Indicator values of the profit and loss statements and balance sheets of an average agricultural enterprise for each year were substituted to the model so that values for matching year of the WACC calculations were possible to be estimated. For further analysis, enterprises that revealed extreme values mainly due to mathematic relations of indicator values had to be eliminated. The final calculation therefore used a sample of 614 enterprises.

Final tables prepared as simple averages of each year and indicator, The Return on Assets (ROA) indicator calculated as a share of the EBIT (earning before interest and taxes) and assets was used for wider analysis regarding the efficiency of enterprises. The greater ROA value was connected to greater equity use and greater growth rate of an enterprise.

The correlation analysis dealing with inter-relations, usually linear, was used to express the relations of indicators. The correlation analysis emphasises the intensity (strength) of a relation more than an investigation of values in the line of causes and results (Hindls, R., Hronová, S., Seger, J., Fischer, J., 2007). It usually assesses the strength of linear relation between a pair of variables, i.e. it finds out a pair correlation coefficients presented as a correlation matrix symmetric along the main diagonal (Hindls, R., Hronová, S., Novák, I., 1999).

Independence of variables means that they are also uncorrelated while other than linear relations may occur between uncorrelated variables (Hebák, P, Hustopecký, J, 1987). Features of the intensity of dependence express the strength of a relation of variables (regardless the course of dependence) as well as they assess the strength of dependence regarding the estimated regression function (Seger, J, Hindls, R., Hronová, S, 1998).

RESULTS AND DISCUSSION

First parts of the analysis calculated the ROA and the WACC indicators that were necessary to

II: *Characteristics of enterprises in 2004–2008*

Item	2004	2005	2006	2007	2008
Legal (%)					
- stock company	37,59	39,34	40,16	42,61	37,93
- limited company	14,89	13,93	14,17	14,78	15,52
- cooperative	45,39	44,26	43,31	41,74	45,69
- individual	2,13	2,46	2,36	0,87	0,86
Average area (ha)	1768,46	1793,74	1745,75	1823,51	1802,99
Average altitude (m a. s.)	459	451,3	459,7	450	453
Type of farming (%)					
- potato	41,13	48,36	48,82	40,00	43,10
- corn	3,55	4,10	5,51	4,35	6,90
- cereal	18,44	15,57	19,69	23,48	24,14
- fodder plants	19,15	13,93	11,81	14,78	16,38
- beet	17,73	18,03	14,17	17,39	9,48
Employees	81	80,6	75,2	75	69

Source: database of agricultural enterprises; own calculation

calculate the total factor productivity and their statistic features of location and variability.

Table III presented a sample of agricultural enterprises in each year through selected indicators assessing enterprise efficiency (Return on assets – ROA), efficiency of factors of production (Total factor productivity – TFP) and the risk expressed as the capital cost indicator (WACC). It was revealed that an average return on assets was positive in all years. The greatest values appeared in 2007 (approximately 7%) with a quarter of sample enterprises that reached the ROA value of more than approximately 10% (upper quartile) ain only a quarter of enterprises with values lower than 4%. The median divided the sample into two halves; one half consisted of agricultural enterprises with the ROA values greater than 6% and the other half reported the ROA of less than 6% in 2007. The standard deviation reporting the variability of values did not show any significant differences in any year of the research. The greatest ROA value appeared in 2008.

The assessment of enterprise profitability has to place the analysis in a broader context. In agriculture, it means to consider natural and climatic conditions for farming. These conditions significantly influence results of an enterprise within different volume of assets, revenues and profit. Regarding this, years 2004 and 2007 were the most successful in agriculture.

The WACC indicator has a range of values from (risk-free rate, a rate of less risk asset, i.e. year state bonds.) to +35% relating to risk margins. The greatest average value of the WACC appeared in 2008. In 2008, the median was the greatest as well. Half of the enterprises reached the WACC of more than 13.86% and the other half had the WACC lower. The greatest variability of the WACC occurred in 2004 as well as the TFP. In this year, a subsidy policy was changed so that this change was probably reflected in indicators dealing with risk.

The TFP indicator assessing the factor productivity based on economic cost was not greater than one (a threshold of production factors efficiency) in any year (average, a median of values respectively). The descriptive features revealed that this limit was reached by a quarter of enterprises in 2004 and 2007 only (upper quartile of 1.01 in 2004 and 2007).

Table IV presents detailed description of the TFP classifying agricultural enterprises according to the following criteria:

- enterprises with the TFP of more than 1;
- enterprises with the ROA < 0 (positive return);

III: *Descriptive features of the ROA, the WACC and the TFP in 2004–2008*

Item	2004	2005	2006	2007	2008
ROA – return on assets (%)					
Average	5.96	3.45	2.77	7.02	3.92
Median	5.39	2.87	2.57	6.00	2.87
Minimum	–3.17	–17.03	–32.87	–1.61	–14.10
Maximum	32.82	27.31	18.94	26.64	24.83
Lower quartile	3.09	0.96	0.94	3.63	1.42
Upper quartile	8.17	5.02	5.37	9.87	6.61
Standard deviation	0.0468	0.0493	0.0522	0.0467	0.0574
WACC – weighted average cost of capital (%)					
Average	11.21	10.20	10.43	12.00	12.95
Median	11.65	10.74	11.28	12.81	13.86
Minimum	0.12	0.98	0.00	1.17	1.39
Maximum	42.15	39.29	24.19	16.23	18.50
Lower quartile	9.68	8.84	8.72	10.29	10.90
Upper quartile	12.76	11.96	12.43	14.17	15.09
Standard deviation	4.1145	3.9192	3.4349	3.0470	3.2003
TFP – total factor productivity					
Average	0.97	0.94	0.93	0.96	0.92
Median	0.96	0.94	0.92	0.95	0.92
Minimum	0.45	0.78	0.66	0.78	0.73
Maximum	1.23	1.16	1.09	1.22	1.20
Lower quartile	0.92	0.89	0.87	0.90	0.86
Upper quartile	1.01	0.98	0.98	1.01	0.99
Standard deviation	0.0884	0.0705	0.0746	0.0783	0.0780
Number of farms	137	121	126	115	123

Source: database of agricultural enterprises; own calculation

- enterprises with the ROA (negative return).

Table IV classified enterprises into three groups. The first group consisted of enterprises efficient enough according to the return (TFP > 1); there were 21% of sample enterprises in average of 2004–2008. These enterprises also reported the return on assets ranging from approximately 7% in 2006 to 11% in 2007. An average value of the return on assets of efficient enterprises was greater than the average of all enterprises; i. e. approximately 10%. The growth rate of the TFP indicated stagnation or an average slight decrease; the ROA growth rate fluctuated in relation to a success of a year influenced mainly by climatic conditions in agriculture. Enterprises with the TFP > 1 also reported great return on assets (with values of approximately 10%); the reversed relation was not so significant, i.e. profitable enterprises (the second group of enterprises with the ROA > 0) did not report the same efficiency of production factors. In average, these enterprises did not overreach the threshold of the TFP value and the ROA average was significantly lower compared to the first group. The growth rate of the TFP did not report any significant change in comparison with the first group. On the other hand, the ROA growth rate fluctuated more significantly. The third group consisted of non-profitable enterprises (ROA < 0) with total factor productivity of less than 0.9. The growth rate of the TFP revealed greater fluctuation within years; however the average of the whole interval had the growth rate equal to 1 (i.e. neither an increase nor a decrease). The ROA indicator reported the lowest value in 2006 followed by 2008. The growth rates and chain indices respectively had to be constructed in a reverse way (the 0 period divided by the 1 period) due to negative values of indicators. In this case, the development of value was the most fluctuating. The efficiency of agricultural enterprises below the profitability threshold was more sensitive to climatic condition changes.

The correlation matrixes (table V) revealed linear relations of indicators. The most intensive dependency was found between the TFP and the ROA (0.70). It means that the efficiency of production

IV: *Classification of total factor productivity in 2004–2008*

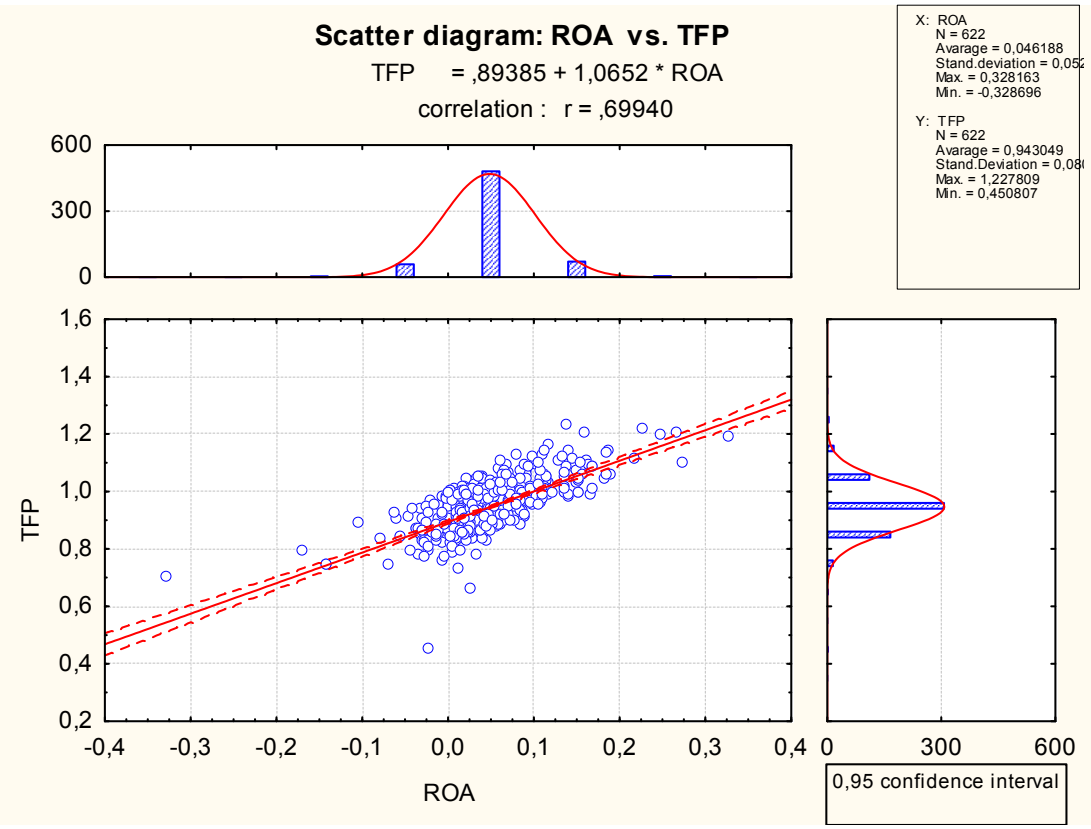
Item	2004	2005	2006	2007	2008	Average growth rate
TFP of all enterprises	0.97	0.94	0.93	0.96	0.92	
- growth rate	-	0.97	0.98	1.04	0.96	0.99
Enterprises with the TFP > 1						
TFP	1.07	1.05	1.03	1.06	1.04	
- growth rate TFP	-	0.99	0.98	1.03	0.98	0.99
ROA (%)	10.11	9.49	7.03	11.08	10.63	
- growth rate ROA	-	0.94	0.74	1.58	0.96	1.01
Share of enterprises with TFP > 1 (%)	28.47	16.53	19.05	27.83	14.78	
Enterprises with the ROA > 0						
TFP	0.97	0.95	0.94	0.96	0.93	
- growth rate	-	0.98	0.99	1.03	0.97	0.99
ROA v %	6.31	4.53	4.08	7.16	5.36	
- growth rate	-	0.72	0.90	1.75	0.75	0.96
Share of enterprises with ROA > 0 (%)	95,62	85,12	84,92	98,26	85,22	
Enterprises with the ROA < 0						
TFP	0.84	0.87	0.86	0.91	0.85	
- growth rate		1.05	0.98	1.06	0.93	1.00
ROA (%)	–1.84	–2.70	–4.59	–0.89	–3.44	
- growth rate	-	0.68	0.58	5.16	0.26	0.85
Share of enterprises with ROA < 0 (%)	4,38	14,88	15,08	1,74	14,78	

Source: database of agricultural enterprises; own calculation

V: *Correlation matrixes of the ROA, WACC and TFP in 2004–2008*

Item	ROA	WACC (%)	TFP
ROA	1.00	0.06	0.70
WACC (%)	0.06	1.00	–0.37
TFP	0.70	–0.37	1.00

Highlighted correlations are significant at the level of. p < .05000 N = 614
Source: database of agricultural enterprises; own calculation



1: *Correlation of the TFP and the ROA in 2004–2008*
Source: database of agricultural enterprises; own calculation

factors is closely related to the efficiency (return) of enterprises. The correlation matrix also revealed an indirect relation of the TFP and the WACC. This relation could be predicted as the WACC is a part of the TFP calculation and it is obvious that the lower risk margins due to enterprise profitability, financial structure and stability of enterprises the greater the total factor productivity (TFP).

Figure 1 presents the course of relations of the ROA and the TFP. In this case, their dependence is direct, i.e. the greater factor productivity the greatest the return on assets.

CONCLUSION

Although productivity – i.e. comparison of inputs and outputs – should be one of the main indicators monitored, its assessment is often marginalized in theory as well as in practice. The assessment of efficiency of production factors is often narrowed to monitoring of productivity of a single factor, which is usually the labour. The paper tried to find relations of monitoring the total factor productivity (TFP), i.e. the indicator assessing the efficiency of factors of production and the return on assets (ROA) indicator which assesses efficiency of enterprises.

The sample of agricultural enterprises revealed the average TFP value under the threshold of 1 (ranging from 0.92 to 0.97) with an average growth rate of 0.1% in a five-year period. In average, there was not more than one third (approximately 21% of the sample in average) of agricultural enterprises with greater outputs compared to inputs (TFP of more than 1). This partial finding is not satisfactory as it revealed that the efficiency of a majority of enterprises is low with greater inputs than outputs although the average returns were positive. It was also proved that efficient enterprises (TFP > 1) reported significantly greater return on assets (ROA) in average (9.67%) compared to the average return of all enterprises (4.62%).

It could be presumed that profitable enterprises (ROA > 0) would reveal greater values of the TFP. This presumption was not proved; not every profitable enterprise also reported the total factor productivity of more than 1. Non-profitable enterprises with ROA < 0 reported lower TFP as well, i.e. the efficiency of production factors also lagged behind.

Note that the return on assets is calculated traditionally, i.e it is based on an accounting profit. On the other hand, the TFP is based on economic approach to costs including alternative equity costs in their definition. Its calculation is therefore rather difficult. The calculation of equity cost is the most demanding. The analysis revealed that agricultural enterprises with the ROA of more than 9.67% realized both accounting and economic profit. The relation of the ROA and the TFP was presumed to

be clarified by a correlation and regression analysis. The analysis revealed medium strong dependence (0.7) of total factor productivity and return on assets.

From the obtained analytical data could be considered that for effective economics management of agricultural enterprises can not be satisfied with only a positive return on assets, when companies are profitable, although they achieve positive value of accounting profit, but may not achieve economic profit (ie companies value, based on measuring by economic value added – EVA may decrease). To ensure long-term performance is essential that the pointer moved the profitability of assets in the farm value of 9.67%, which leads to the appreciation of capital invested by owners which means that the enterprise value will increase.

SUMMARY

The aim of the paper was to analyse relations of efficiency of factors of production measured by factor productivity based on economic profit and returns (profitability) of enterprise measured by the most synthetic profitability indicator (Return on Assets, ROA). A partial aim was to consider risk analysed through ratio of cost to capital (Weighted Average Cost of Capital – WACC). The TFP was calculated according to Neumaierová and Neumaier, 2002. The financial statements were resource of data (balance sheets; profit and loss statements) for 2004–2008. The original database of 622 agricultural enterprises was created within the MSM 6007665806 research project was used. The calculation of the WACC uses a build-up model according to the INFA methodology available at www.mpo.cz website to set equity costs. ().For further analysis, enterprises that revealed extreme values mainly due to mathematic relations of indicator values had to be eliminated. The final calculation therefore used a sample of 614 enterprises. Final tables prepared as simple averages of each year and indicator. The correlation analysis dealing with inter-relations, usually linear, was used to express the relations of indicators.

The sample of agricultural enterprises revealed the average TFP value under the threshold of 1 (ranging from 0.92 to 0.97) with an average growth rate of 0.1% in a five-year period. In average, there was not more than one third (approximately 21% of the sample in average) of agricultural enterprises with greater outputs compared to inputs (TFP of more than 1). This partial finding is not satisfactory as it revealed that the efficiency of a majority of enterprises is low with greater inputs than outputs although the average returns were positive. It was also proved that efficient enterprises (TFP>1) reported significantly greater return on assets (ROA) in average (9.67%) compared to the average return of all enterprises (4.62%).

It could be presumed that profitable enterprises (ROA> 0) would reveal greater values of the TFP. This presumption was not proved; not every profitable enterprise also reported the total factor productivity of more than 1. Non-profitable enterprises with ROA<0 reported lower TFP as well, i.e. the efficiency of production factors also lagged behind. The relation of the ROA and the TFP was presumed to be clarified by a correlation and regression analysis. The analysis revealed medium strong dependence (0.7) of total factor productivity and return on assets.

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REFERENCES

HEBÁK, P., HUSTOPECKÝ, J., 1987: *Vícerozměrné statistické metody s aplikacemi*. 1. vyd. Praha: SNTL, 452 s.

HINDLS, R., HRONOVÁ, S., SEGER, J., FISCHER, J., 2007: *Statistika pro ekonomy*. 8. vyd. Praha: Professional Publishing, 2007. 415 s. 978-80-86946-43-6.

HINDLS, R., HRONOVÁ, S., NOVÁK, I., 1999: *Analýza dat v manažerském rozhodování*. 1. vyd. Praha: Grada Publishing, 358 s. ISBN 80-7169-255-7.

JÍLEK, J., MORAVCOVÁ, J., 2007: *Ekonomické a sociální indikátor: od statistik k poznatkům*. 1. vyd. Praha: FUTURA, 246 s. ISBN 978-80-86844-29-9.

2001*: MEASURING PRODUKTIVITY – OECD Manual*, Measurement of aggregate and industry-level produktivity growth, Paris: OECD.

Ministerstvo průmyslu a obchodu ČR: Benchmarkingový diagnostický systém finančních indikátorů INFA. [online]. 2011 [cit. 2010-12-03]. Dostupné z www: < http://www.mpo.cz/cz/ministr-a-ministerstvo/ebita/>.

NEUMAIEROVÁ, I., NEUMAIER, I., 2002: *Výkonnost a tržní hodnota firmy*. 1. vyd. Praha: Grada Publishing, 215 s. ISBN: 80-247-0125-1.

NOVOTNÁ, M., VOLEK, T., 2008: *Měření efektivnosti využívání výrobních faktorů v souvislostech*. 1. vyd., České Budějovice: EF JU v Českých Budějovicích, 118 str. ISBN 978-80-7394-126-0.

SEGER, J., HINDLS, R., HRONOVÁ, S., 1998: *Statistika v hospodářství*. 1. vyd. Praha: ETC Publishing, 636 s. |ISBN 80-86006-56-5.

SYNEK, M. a kol., 2007: *Manažerská ekonomika*. 4. aktualiz. a rozš. vyd. Praha: Grada Publishing, 452 s. ISBN 978-80-247-1992-4.

SYNEK, M., 2004: *Ekonomická analýza*. 1. vyd. Praha: Oeconomica, 79 s. ISBN: 80-245-0603-3.

VALACH, J., 1999: *Finanční řízení podniku*. 2. aktualiz. a rozš. vyd. Praha: EKOPRESS, 324 s. ISBN 80-86119-21-1.

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