

# AGRICULTURAL PRODUCERS' GROUPS IN THE CZECH REPUBLIC: INTRODUCTORY REVIEW AND DISCUSSION OF THE PROBLEM AREA ECONOMIC PERFORMANCE MEASUREMENT

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## Abstract

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Each company is surrounded by the micro- and macro-environment affecting also its economic performance. These factors are not only individual accounting entries, but also analytical inputs as the internal company processes, management of costs or short-term financial decisions and specifically in the case of agriculture within the EU also the public subsidy schemes implemented through the EU Common Agricultural Policy. Groups of agricultural producers are created as a response to current market dynamics and the opportunity for each agricultural enterprise regardless the size. In this paper, the basis for agricultural cooperation is provided, traditional economic performance measures are presented and their applicability on the sample of agricultural producers' groups and wholesale entities is empirically verified. Wholesale entities are analysed by its business activity and performance features to consider whether they are suitable peer group for comparing economic performance of examined agricultural producers' group. Since the economic performance of agricultural producers' groups directly affects the economic performance of all participating entities, and vice versa, their economic performance measurement may involve specific constraints. According to the structure and characteristics of agricultural producers' groups may be inferred that whilst the common performance measurement techniques are applicable on the majority of companies, agricultural producers' groups represent specific entities and therefore need adjusted performance measurement approach.

agri-business, agricultural producers' group, analytical performance approaches, economic performance, wholesale entities

Agricultural enterprises in the Czech Republic have to face for a long time period tough direct competition on the market place and the increasing dynamics of competition forces' models within the agribusiness as well. Inevitably, the agricultural entrepreneurs have to actively seek new approaches for increasing their competitiveness (Huml, Vokáčová and Kala, 2010; Adenaeuer and Heckelei, 2011; Pennerstorfer and Weiss, 2012). The ultimate one, logically, is to boost their economic performance. The economic performance of respective agricultural entrepreneur depends on factors from company's micro- and macro-

environment and it is the same situation as in any other industry sector (Arcas-Lario and Hernández-Espallardo, 2003). However in the case of agricultural enterprises the public subsidy schemes via EU Common Agricultural Policy (CAP) are pointed out to be very important factor that has to be involved in the competitive strategies for every agricultural business entity. Therefore supported clustering of agricultural enterprises by CAP via cooperation or integration of agribusiness entities could be one possible way how to sustainably compete on the European single commodity market (Bogetoft, 2005).

The main forms of this trend among agricultural enterprises are the groups of agricultural producers as the legal business forms of horizontal cooperation/integration in the Czech Republic, in the forms of so called equity alliances (Lavie, Haunschild and Khanna, 2012). Since the agricultural producers' groups present a significant opportunity within the food chains which is confirmed both in national and international research comparisons (Pascucci, Gardebrock and Dries, 2012), according to the current findings, Czech agricultural producers groups (APGs) still did not discovered those advantages completely (Tvrdoň, Peřinová, Erlebach, 2003).

The main objective of this paper is to identify the suitable approach for measuring the economic performance of APGs considering the specifics of these type of business entities. In order to achieve the main goal of the paper, there were set up the following partial goals. The first partial goal is to bound the appropriate economic performance indicators, including their limitations. The second partial goal is to provide the economic characteristics of the sample of APGs and to prove, whether the wholesale entities are the relevant peer group for them.

The paper is organised as follows. The first chapter provides the materials and methods obtained and employed within this paper, including the description of data sample. Second chapter discusses the results, both derived from the literature review and from empirical analyses of economic performance of APGs in the Czech Republic. Discussion and conclusion are presented in the third and fourth chapter, respectively.

## MATERIALS AND METHODS

This paper is based on the empirical research of economic performance measurement within the groups of agricultural producers and wholesale entities within the sector of fruit and vegetable in the Czech Republic. Data were extracted from the

corporate database Amadeus of Bureau van Dijk (Amadeus) covering the year 2010. In our sample (see Tab. I), representatives of Czech APGs and wholesale entities within the fruit and vegetable sector are presented together with selected indicators of economic performance are examined research variables.

For the purposes of this paper, the review of current scientific papers was conducted and the quantitative data of observed entities were analysed by parametric one-way analysis of variance (ANOVA). ANOVA was accompanied by empirical verification of primary assumptions which were tested for homoscedasticity (Bartlett's test) and normality of distribution (Shapiro-Wilk test). Non-parametric Kruskal-Wallis analysis of variance was employed when the assumptions of homoscedasticity and normality of distribution were not met.

On the basis of obtained data not only the applicability of common performance techniques is examined, but also the comparability and interpretability of results is provided, mainly with respect to companies' structures of assets and capital, and possible similarities with proposed peer group entities. All the findings are supported with the literature review on APGs and measurement of their performance from valuable resource as for example Banaszak (2005, 2007); Bigliardi and Bottani (2010), Pascucci, Gardebrock and Dries (2012). This article draws primarily on the work of Vavřina and Martinovičová (2011).

## RESULTS AND DISCUSSION

### The current state of art of the problem area cooperation / integration among agribusiness entities in the Czech Republic and approaches to its economic performance measurement

The group of agricultural producers can be defined within the subsequently mentioned public regulatory measures as a corporate or a cooperative

I: Sample descriptive statistics, 2010, source: own work

Item	Agricultural producers' groups		Wholesale entities	
	Mean	Standard deviation	Mean	Standard deviation
Return on shareholder funds (%)	19.78	42.69	18.53	55.94
Return on assets (%)	2.29	4.58	6.65	9.01
Profit margin (%)	0.57	1.47	2.02	3.38
Current ratio	1.27	0.39	1.57	1.05
Return on equity (%)	16.81	37.15	11.72	50.82
Operating cycle (days)	115.86	44.50	122.76	60.11
Cash conversion cycle (days)	55.15	25.33	69.60	41.47
FATA	0.12	0.19	0.22	0.21
CTA	0.27	0.21	0.40	0.24
Net asset turnover	46.84	54.86	21.27	35.97
Sample size	9		40	



1: Development of index of production value at producer price within the Economic Accounts for Agriculture and indicators animal and crop outputs in time period 2004–2011 (year 2004 = 100), Source: own work based on data of Eurostat, 2012

corporate according to the Czech Business Law<sup>1</sup>, with the main activity of securing common sell of defined agricultural commodity (Tvrdon, Peřinová, Erlebach, 2003).

One of the major reasons for clustering initiatives within the agribusiness can be seen at the unfavourable development on agricultural markets of both animal and crop production, which is influenced by the world financial crisis after year 2008 (see Fig. 1).

Chavas (2011) highlights in his work the differences in food prices on the example of three basic commodities: corn, wheat and milk. He states that whilst from the short-term perspective the prices nearly doubled, the long-term look confirms the inverse. Subsequently to face price volatilities and respective economic consequences for individual agricultural producers would represent the efficient cooperation/integration of individual business entities a useful tool for creating the competitive advantage for agricultural producers.

In compliance with aforementioned facts, the economic performance of these groups of agricultural enterprises as legal entities directly influences the economic performance of their members, i.e. individual participating enterprises. The essence of this idea is based on existence of exclusive business agreements related to reselling the participant's production, co-operative bargaining for production inputs, external services etc. (Tvrdon, Peřinová and Erlebach, 2002; Bogetoft, 2005; Hernández-Espallardo, Arcas-Lario and Marcos-Matás, 2012). Nevertheless, there are authors defining success of cooperative organizations in very different terms (Noe and Rebello, 1995; or Bruynis, 1997, Sexton and Iskow, 1988, Ziegenhorn, 1999, all cited in Banaszak, 2007).

In the context of current needs of small and medium-sized enterprises (SMEs), any cooperation represents an effective competitive tool in the process of globalization. SMEs cannot apply the economies of scale, or those companies have to face the tough bargaining power of customers or suppliers. In accordance with these facts, those companies create some form of mutual horizontal cooperation of similarly operating companies to remain competitive and viable. Those networks are created to improve the products' positions, sharing costs or simply to reduce the competitive forces within the industry (Arcas-Lario and Hernández-Espallardo, 2003; Structural change in agriculture, 2011). The situation in the Czech Republic, as it can be seen in Tab. II, fulfils this premises. When we focus on the indicator *Standard output of agricultural holdings* and compare year 2007 and 2010 it is obvious that only large entities were able to increase their value of standard output. Subsequently, the number of very small business entities has diminished and on the other hand number of large agricultural business entities has increased.

The establishment and further development of APGs in the Czech Republic as the form of horizontal cooperation/integration is strongly encouraged by the public subsidy schemes of the EU CAP. The significant increase of newly established groups of agricultural producers after EU accession in the year 2004 can serve as the evidence (Tab. III). This fact is connected mainly with the broaden scope of accessible subsidy titles and respective financial budget, namely the subsidy title *Setting up of Producers' Groups*<sup>2</sup> and the Common Organization of Market with fruit and vegetables (Vavřina, Martinovičová, 2011).

1 Act No. 513/1991 Coll. in current version Obchodní zákoník

2 This measure is the part of the Rural Development Plan of the CR for the time period 2007–2013.

II: *Economic size of farm (in Standard output in Euro) and its distribution in the Czech Republic in years 2007, 2010, source: own work based on data of Eurostat, 2012*

Economic size of farm (Standard output in Euro)	Total number of agricultural holdings			Value of standard output (St. output in mil. Euro)		
	2007	2010	Index 2010/2007	2007	2010	Index 2010/2007
Total	39 400	22 860	58.0	3 593.2	3 852.2	107.2
< 2 000	11 850	1 480	12.5	11.9	1.7	14.5
2 000–3 999	6 470	2 460	38.0	18.5	7.4	40.2
4 000–7 999	5 360	4 110	76.7	30.5	24.0	78.7
8 000–14 999	4 010	3 500	87.3	44.4	38.6	86.9
15 000–24 999	2 620	2 390	91.2	51.2	46.6	91.1
25 000–49 999	3 170	2 800	88.3	113.4	99.5	87.8
50 000–99 999	2 040	2 030	99.5	143.0	143.8	100.6
100 000–249 999	1 530	1 670	109.2	239.7	264.2	110.2
250 000–499 999	760	760	100.0	273.8	272.0	99.3
> 500 000	1 590	1 670	105.0	2 666.9	2 954.3	110.8

III: *Number of producers' groups before and after CZ accession to the EU (own work based on data from Ministry of agriculture (2003) and database Amadeus (2010)*

	Number of producers' groups in the CZ	
	2003	2010
Fruit and vegetable sector	8	16

The objective of subsidies which are provided, for example, under the Common Organization of Market with fruits and vegetables is to financially support the approved organizations of producers or groups of producers organizations, which were approved by responsible government authority, or pre-approved groups of producers based on application for pre-approval according to the Council Regulation (EC) No. 1234/2007<sup>3</sup>, Commission Regulation (EC) No. 1580/2007<sup>4</sup> and Czech Government directive No. 318/2008 Coll., in current version<sup>5</sup>. The eligible applicants for subsidies under Common Organization of Market with fruits and vegetables are entrepreneurs in form of both personal and legal bodies according to the Czech Government directive No. 318/2008 Coll., in current version. The financial subsidies for pre-approved groups of producers, which fulfil other related obligations, are disbursed similarly to the measure Setting up of Producers' Groups, i.e. according to the financial value of the annual amount of traded production. On the other hand, the approved organizations of agricultural producers have got their specific own worked operational programme and the financial subsidy is disbursed according to its capital expenditures,

which are reviewed by respective government administrative authority, namely the State Agricultural Intervention Fund.

The financial subsidy for applicants, which fulfil other measure's conditions, is disbursed according to the respective performance indicator. The only one observed performance indicator in this case is the financial value of annual amount of traded production. Nevertheless, the overall economic performance management of APGs has to be obviously based on broader scope of indicators. This statement is supported primarily with the fact that APG is the regular business entity.

Kaplan and Norton (2006) highlight the fact that the most important factor to be considered in the context of company performance in general is the system alignment, because the company value is driven by the company itself. They introduce the process of value creation as a synthesis of value originated in customers and value originated in company itself. Company value may serve as an effective performance measure due to monitoring of the complete information from company's background (Randall, 1999). Moreover, by company value maximization benefit not only the company owners, but also other stakeholders, i.e. customers,

3 Council Regulation (EC) No. 1234/2007 establishing a common organisation of agricultural markets and on specific provisions for certain agricultural products (Single CMO Regulation).

4 Commission Regulation (EC) No. 1580/2007 laying down implementing rules of Council Regulations (EC) No. 2200/96, (EC) No 2201/96 and (EC) No. 1182/2007 in the fruit and vegetable sector.

5 Act No. 318/2008 Coll. in current version o provádění některých opatření společné organizace trhu s ovocem a zeleninou.

creditors or employees (Neumaierová, 2005). However, this fact is often underestimated by APG members (Banaszak, 2005).

There are many company performance measures broadly used by theory and practice (Chmelíková, 2011; Damodaran, 2007; Beranová

and Basovníková, 2011; Jewell and Mankin, 2011; Saunders, Kaye-Blake, Hayes and Shadbolt, 2007). Table IV introduces the classification of company measurement techniques into two major types of indicators' groups: the aggregated and analytical. The aggregated measures try to reflect all company

IV: The overview and description of the indicators related to performance measurement, source: own work based on Kaplan and Norton, 2007; Bigliardi and Bottani, 2010; Brezuleanu and Brezuleanu, 2011; Vavřina and Martinovičová, 2011

Type of indicator	Measures of company performance	Description and calculation	Limitations
Aggregate financial measures	Earnings after taxation (EAT)	EAT of a company are calculated as the sum of all relevant expenses deducted from the net sales realized. The important part from the expenses is created by costs of goods sold (COGS). EAT can be considered as net income (NI).	Therefore, to have a positive EAT does not necessarily mean showing adequate performance (different accounting policies, extraordinary company activities,...). In addition, EAT provides only the information from the current year, and uses nominal or historical prices.
	Margin ratios	<b>Gross profit margin</b> compares the revenues after the deduction of COGS with the revenues, whereas <b>net profit margin</b> uses in numerator directly NI.	These ratios can be applied in time and are suitable for an interfirm comparison of performance. But, there are few application constraints, for example leasing, or intangible assets which are not recognized by accountancy.
	Profitability ratios	<b>ROS</b> uses EBIT in its calculation which is then divided by company's revenues. <b>ROA</b> employs also EBIT in its calculation which is then divided by company's assets, to find out how profitable a company is relative to its total assets. <b>ROE</b> shows the amount of NI returned as a percentage of the company equity to present how much profit company generates with the invested money.	Profitability ratios do not measure the company success; rather, they should be compared with the opportunity costs. Moreover, those indicators do not reflect the factor of risk and provide only historical information, not the predictive perspective.
	Return ratios		
	Pyramidal decomposition of aggregated measures	The <b>EVA</b> indicator stands for economic value added and is often calculated as net operating profit after taxation (NOPAT) minus the discount rate multiplied by the company capital (C).	It is a typical example of component analysis based on decomposition of factors affecting the performance. Despite the facile interpretation, many analytical steps need to be done.
Analytical	Predictive aggregated measures	The calculation of <b>CFROI</b> assumes initial investment (II) in the form of the company itself. This II then equals the sum of quotients originated in comparing gross CF with CFROI and net assets with CFROI, including the economic lifetime ( <i>n</i> ) in particular years ( <i>t</i> ). The <b>MVA</b> is calculated as the difference between the market value of a company and the invested capital. <b>SVA</b> serves for the value for the owner's value calculation, where the two shareholder values are compared.	The objective of these measures is to find an aggregated view on company performance assuming the company as an investment. The attention is paid especially on prediction of future perspective. Moreover, the purpose of MVA and SVA approaches is its applicability at publicly traded enterprises, which is not the case of the Czech groups of agricultural producers according to findings of Vavřina and Martinovičová (2011).
	Balanced Scorecard (BSC)	The method of BSC translates the overall company strategy into specific goals for particular perspective of performance to enable measuring, monitoring, managing and evaluating those goals in the compliance with the relation cause – consequence.	Although the complex approaches were originally developed for purposes of industrial enterprises, they seem to be applicable after verifying of certain conditions within agricultural producers' groups as well (Kaplan and Norton, 2007; Bigliardi and Bottani, 2010; Brezuleanu and Brezuleanu, 2011).
	Benchmarking	The logic of company performance is connected with similarity to the reference, i.e. the way of performing an activity. This approach enables better understanding of the process of assessing company performance. By comparing individual features of particular activity with the presented reference, an insight into the uniqueness of the activity can be reached.	



performance aspects, whereas the analytical measures focus on particular aspects of company performance. Nevertheless, those two perspectives are mutually interconnected. For the purposes of this article, the classification of aggregated and analytical measures will be applied; however, the measures will be distributed with modifications. Earnings after taxation, profitability ratios, pyramidal decomposition of profitability ratios and predictive aggregated measures will be treated as aggregated measures, whereas Balanced Scorecard and Benchmarking will be considered as analytical measures of company performance. The overview of mentioned measures related to the area of APGs provides Tab. IV.

All the aggregate financial measures use as input variables publicly issued data from financial statements, available for example in the Czech Business Register, or databases of corporate economic data, e.g. Amadeus. However, the case of pyramidal decomposition of EVA indicator involves the costs of equity estimation, which can be calculated either via CAPM (Capital Assets Pricing Model) or INFA method. Moreover, all the aggregate financial measures are relatively easily interpretable. Both absolute and relative measures can be interpreted on the year-on-year basis as time series' development, or within a homogeneous group, for example to identify the market leader. Therefore, any potential comparability is executable, however strongly depending on need for respective system of peer group clustering according to for instance range of economic activities, provided services and total economic size of all participants via employing relevant indicator.

The second group of indicators, BSC and benchmarking do not need only financial statements as primary input data, but also significant internal data and employing detailed knowledge of internal business processes. Only under these circumstances the results might be interpreted correctly, for example via decomposition of respective components such as aggregated, analytic or ratio indicators and their vertical and horizontal analysis. Then, the comparison within the sample might be done, however it is strongly depending on the need for respective system of peer group clustering as well. For example, a detailed study was conducted by Banaszak (2007) in Poland. She focused directly on measuring the APG's success and failure based on game theory and transaction costs theory. She comes up with the most frequent problem among the failing groups: the member commitment and leadership. She also provides few particular recommendations, in compliance with the rule of cause – consequence, as mentioned at economic performance measurement via BSC.

Results of the economic characteristics' comparison among sample of producers groups and wholesale entities

The features and specifics of APGs are examined on the sample of 9 APGs and obtained results

are compared with the sample of 40 wholesale entities (WEs) to verify the economic peer group comparability between those two types of business entities. Both samples operate within the fruit and vegetable sector in the Czech Republic, as it is described in Tab. I., according to the information from the database Amadeus in 2010. The sample of WEs was chosen due to the fact that reports some similarities with APG, mainly in terms of their motives and character of business activities (Tvrdoň, Peřinová and Erlebach, 2002). Both these entities act as agents between growers/producers and customers (Banaszak, 2005; Samuel and Shah, 2009). Chosen similarities are further examined and empirically verified later in the paper.

Selected ratios of financial situation of these entities and their descriptive statistics are presented in the Tab. I. All absolute measures were left out due to their non-comparability within the sample.

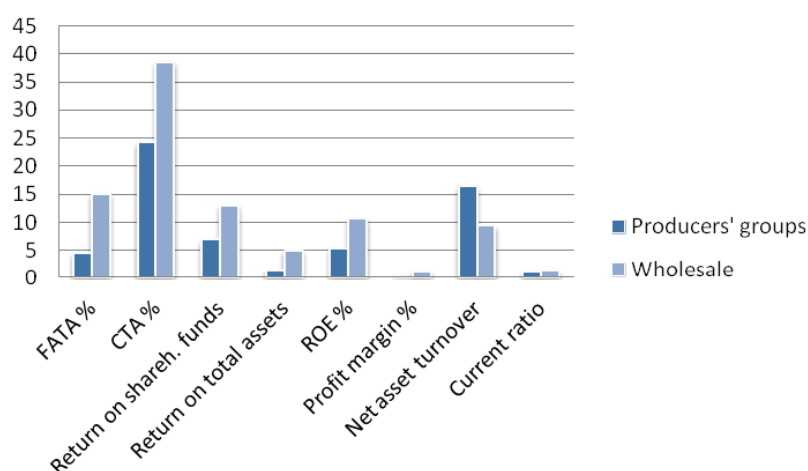
Basic features of APGs in terms of measuring their economic performance relate primarily to the property and financial structure. Therefore, APGs and WEs were compared in terms of their property and financial structures (see Fig. 2).

Since APGs constitute individual business entities grouping individual agricultural enterprises, those groups do usually operate with current assets instead of fixed assets. These current assets are often financed by current liabilities. Whereas the fixed assets are absenting these entities, short-term liabilities create the majority of companies' balance sheet total liabilities (low levels of FATA and CTA). It is not obvious for these business groups to employ external financial sources, for example bank loans, they rather ask for public funding. Similar specifics bear the WEs, operating with current assets and using current liabilities as a main financial source.

All the returns ratios indicate low profitability, just as net asset turnover which indicates low turnover rate. The return on assets is calculated as a ratio of net income and total assets. Those ratios are very low for both analysed industries. Moreover, the ROA for APGs is almost zero, which points at very low or even negative net incomes. The return on shareholder funds, as a ratio of profit/loss before tax and equity (total assets minus total liabilities), is higher than the ROA, and in this case is again higher for WEs. Profit margin uses profit of loss before tax (ROS uses EBIT) when comparing with turnover (operating revenue). This margin is extremely low in both cases; however it is slightly higher in the wholesale sector (Fig. 2).

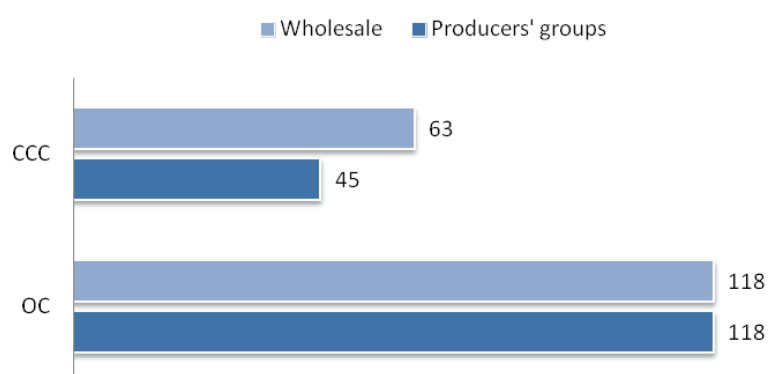
The examined samples confirmed that it is obvious for these companies to operate on the basis of buying and selling proved by the policy of "strict collections and lax payments", especially in the sample of APGs. These features are presented with the length of Operating cycle (OC) and Cash conversion cycle (CCC), which show that for example APGs receive their cash from operations each 45 days, compared to WEs which receive the cash each 63 days (see Fig. 3). This fact may be the

### Financial specifics of APG and WE



2: Financial specifics of APG and WE: value of medians within observed financial indicators, own work based on data from Amadeus (2010)

### Short-term financial decisions: comparison of OC and CCC



3: Short-term financial decisions of sample entities, value of medians; own work based on data from database Amadeus (2010)

result of intercompany arrangements, based on fact that the suppliers of APGs are individual APGs members and often even the co-owners of the APGs. On the contrary, both samples show considerably low profitability, reflected by low profit margins. Moreover, pure APGs report even lower profit margin compared to WEs. These low profit margins may be the consequences of enormous sales, however, accompanied with high costs of goods sold (COGS) which results in low net incomes (see Fig. 2).

Results of the empirical verification of employed economic performance measures within the fruit and vegetable business industry

Further statistical verification of previous assumptions of differences and similarities between APGs and WEs was managed within the fruit and vegetable branch. The partial goal of the paper is to identify via statistical analysis, whether WEs can be the suitable peer group for comparison of APG's business performance. Exactly the identification

of a suitable peer group was discussed to be the main constraint for employing modern analytical performance measurement approaches and other rigorous economic analysis. The problem area of setting up a suitable peer group for APGs has not been discussed so far by other authors yet according to our literature review findings. So, this is the reason, that the results of the conducted empirical analysis are discussed with findings of other authors at general frame level.

According to the selected results of statistical tests (see Tab. V) it can be stated that homoscedasticity and normality of distribution of APGs and WEs sample of business entities based on Bartlett's test for equality of variances (verified via Cochran's test for equality of variances) and Shapiro-Wilk Normality test (verified via modified Kolmogorov-Smirnov normality test) was met only for indicators Cash conversion cycle (CCC) and Capital to balance sheet total (CTA). So, the parametric analysis of

V: Statistical tests of observed economic indicators (significance level = 5%); own work based on data from database Amadeus (2010)

Indicator	Bartlett's test for equality of variances		Shapiro-Wilk Normality Test				Parametric ANOVA/ Non-parametric (KW) ANOVA	
	P-value	F	APG		WE		Prob>F / Prob>Chi-sq	F / Chi-sq
			P-value	Test statistic	P-value	Test statistic		
Return on shareholder funds	0.3641	0.8238	6.4097e-004	0.5451	1.3157e-005	0.7637	- / 0.3661	- / 0.82
Return on total assets	0.38	4.3033	0.0396	0.7919	0.0111	0.9109	- / 0.1711	- / 1.87
Return on equity	0.2975	1.0852	6.5587e-004	0.5467	1.8555e-006	0.7054	- / 0.4697	- / 0.52
Operating cycle	0.0315	4.6273	0.5514	0.9039	0.5514	0.9039	- / 0.4854	- / 0.49
Cash conversion cycle	0.3256	0.9664	0.9884	0.9313	0.4518	0.9638	0.1748 / 0.2347	1.9 / 1.41
Profit margin	0.0135	6.103	0.037	0.8219	1.7913e-004	0.8452	- / 0.1213	- / 2.4
FATA	0.7835	0.0755	0.0028	0.6449	0.0011	0.8680	- / 0.0748	- / 3.18
CTA	0.5875	0.2943	0.4273	0.8929	0.1993	0.9534	0.1579 / 0.1793	2.06 / 1.8
Net Assets turnover	0.1005	2.6979	0.0453	0.8039	8.0017e-009	0.4963	- / 0.1342	- / 2.24
Current ratio	0.0046	8.0391	0.2018	0.862	2.9831e-007	0.6434	- / 0.6237	- / 0.24

variance was allowed to be employed to verify, whether both APGs and WEs come from population with the same mean of indicator CCC and CTA. The results of this test proved the assumption on the significance level of 5%. To prove these results the non-parametric analysis of variance was employed as well and the results again met the assumption that both samples of entities come from population with the same mean of indicator CCC and CTA.

Indicators Return on shareholder funds, Return on total assets, Return on equity, Operating cycle, Profit margin, FATA, Net assets turnover and Current ratio did not meet either the need for homoscedasticity or normality of distribution for both APGs and WE entity samples, even when Cochran's homoscedasticity test and modified Kolmogorov – Smirnov normality test were employed. Therefore, to verify the results of normality testing the QQ plots were elaborated as well and only non-parametric analysis of variance was employed. Nevertheless, all results of non-parametric Kruskal-Wallis analysis of variance proved that APGs and WEs come from the population with the same mean of the aforementioned indicators.

Statistical analysis of results of empirical research within selected economic performance indicators proves that within the primary analysis of this problem area WEs appear to be the suitable peer group for comparing economic performance of APGs and employing analytical economic performance measures.

Our results are similar to findings of Tvrdouň, Peřinová, Erlebach (2003), who regard agricultural producers groups as the adequate business entities. We consider the wholesale entities, according to our findings, to be more suitable peer group for APGs, rather than the comparison with the pure agricultural enterprises in terms of the economic performance.

## CONCLUSIONS

The main findings within the problem area measurement of agricultural producer groups' economic performance revealed that there are suitable approaches to be effectively employed. The explored and identified characteristics of agricultural producers groups do differ with conventional performance measurement techniques as it was discussed.

There are also initially outlined the comparisons of chosen techniques for company performance measurement, summarized the commonly used performance measurement techniques and presented specific applicability limitations. Consequently, there are provided possible basis for further research in employment of analytical performance measurement systems of researched producers' groups as Balanced Scorecard or Benchmarking. Nevertheless, the strong need for setting up the suitable peer group was identified as the main constraint for employing not only the modern analytical performance measurement approaches and other rigorous economic analysis, but also for effective usage of so called conventional measures.

According to the identified specifics and features of agricultural producers' groups on the one hand and similarities with wholesale entities on the other hand, entrepreneurs being active in the fruits and vegetable business branch were the focus entities for the statistical testing. The partial objective of statistical testing was to accept or reject the assumption of economic performance similarities between them. The conducted tests proved that the wholesale entities appear to be the relevant benchmark for agricultural producers groups.

This article above all presents authors' initial phase within exploring the problem area measurement the performance of agricultural



producers groups. The given results will be continuously verified and the following studies will be aimed at further empirical analyses of particular methods and approaches including involvement of other substantial agricultural commodity branches.

## SUMMARY

The objective of this paper is to identify via analysis and synthesis of current state of art and empirical research the applicability and related constraints of different possible approaches for measurement and inter entity comparison of corporate economic performance as the economic aspect, which essentially affects economic viability and sustainable development of participating individual agricultural enterprises as members of agricultural producers' groups. The article is based on the empirical research of economic performance measurement within the sample groups of agricultural producers and wholesale entities, namely being active within the sector of fruit and vegetable in the Czech Republic. Data were extracted from the corporate database Amadeus of Bureau van Dijk covering the year 2010. The quantitative data of observed entities were analysed by parametric one-way analysis of variance (ANOVA). Non-parametric Kruskal-Wallis analysis of variance was employed when the assumptions of homoscedasticity and normality of distribution were not met. The comparison of chosen performance measurement techniques is carried out to describe and analyse possible approaches and each techniques, respective limitations, required input data and interpretability is presented. The explored and identified characteristics of agricultural producers groups were evaluated as being different from the conventional performance measurement techniques. So, the strong need for setting up the suitable peer business group was identified as the main constraint for employing not only the modern analytical performance measurement approaches and other rigorous economic analysis, but also for effective usage of so called conventional economic performance measures. The conducted analysis proved that the wholesale entities appear to be the relevant benchmark for agricultural producers groups.

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