Horizontal cooperation among fruit and vegetable producers in the Czech Republic

Jan Vavřina, Dana Martinovičová

Abstract: The sustainable development of agricultural enterprising in EU member countries strongly involves the EU Common Agricultural Policy (CAP) instruments. The upcoming programming period 2014 - 2020 is again opening discussions about modification the CAP within the frame of encouragements for agricultural business entities. Consequently, there can be seen attempts of single standing farmers to use synergies, which are connected with their mutual cooperation. The need to increase economic efficiency in agricultural production is obvious. The objective of this paper is to assess impacts of current CAP instruments on the economic performance of Czech farmers which entered mutual business cooperation which are specialized in the production of fruit and vegetable. The data sample consists of agricultural entities, which are being or were members of biggest fruit and vegetable agricultural groups according to the subsidy beneficiaries list of the State Agricultural Intervention Fund.

Key words: agriculture · cooperation among enterprises · economic efficiency · EU Common Agricultural Policy

JEL Classification: L25 · Q13 · M21

1 Introduction

Current situation at the agricultural industry in the Czech Republic was ultimately influenced by joining the European Union. On one hand, there have been accessible operational and investment subsidies within Common agricultural policy and on the other hand there have been diminished national government’s protectionism tools towards Czech business entities due to CAP common market principles (Huml, Vokáčová and Kala, 2010). So, Czech agricultural producers have to face both direct competitors at the EU common market and strengthening dealing power within agricultural commodities verticals (Blažková, 2010). One of the obvious consequences of such a development is the gap between commodities’ prices of agricultural producers and concurrently respective consumers’ prices with negative impact at agricultural producers (Chavas, 2011).

Possible approach for individual agricultural producers how to encourage their competitiveness within aforementioned situation could be their concentration into economically larger units called groups of producers to improve their negotiating position (Bogetoft, 2005).

This article aims to assess economic performance of Czech agricultural companies, which entered mutual business cooperation using the selected financial analysis indicators. The focus is then given on the cooperation activities within commodities fruit and vegetable. Results of financial analysis are verified using statistical hypothesis testing.

The strong incentive behind cooperation among legally self-standing agricultural business entities can be found in the subsidies, which were accessible in the EU pre-accession period (Ministry of Agriculture, 2006). Nevertheless, the strongest evolvement of agricultural producers groups was obvious in the Czech Republic after EU accession within Horizontal rural development programme for time period 2004 - 2006 and respective measure “Setting up of the groups of producers” (Vavřina and Martinovičová, 2011). The motivation to create specialized sales organizations of agricultural producers in the Czech Republic regarding economic objectives can be found in the need to create sufficient economic background concerning situations of their financial troubles and to provide management of receivables and payables for member enterprises based on contractual relations (Tvrdoň and Krčová, 2002). Horizontal rural development programme (HRDP) was implemented into the Czech law and order by respective executive national regulations, namely regulation nr. 655/2004 Col. in current version, which deals with setting up of conditions of producers’ involvement into the program “Setting up the producers groups”.

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The measures of HRDP regarding groups of agricultural producers were applicable till the end of year 2011, when it was paid out the last subsidies for agricultural producers groups. The Rural development programme, which is applicable in the Czech Republic within the programming period of years 2007 – 2013 has never opened its measure Producers groups. This programme only allocated the contracted amount of subsidies for agricultural producers groups under the HRDP (Ministry of Agriculture, 2012).

The revised working document Proposal for a Regulation of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural development nr. 17352/1/12 rev. 1 as the draft of the Regulation of the European parliament and of the Council, which proposes to continue with encouragements for agricultural producers within the following programming period of years 2014 – 2020. The motivation for this type of encouragements is very similar to the previous programming periods. Namely, the motivation is to sustain the increased competition on market and consolidation of business entities within marketing of agricultural commodities, including local markets using the new formed EU Common Agricultural Policy.

2 Methods

The contribution is based on the secondary research. The main information resources employed are databases of the State Agriculture Intervention Fund, datasets of Czech Farm Accountancy Data Network (FADN CZ) that collects structural and accountancy data of farms, based on system of sample surveys conducted every year. There was utilised corporate database Amadeus of Bureau van Dijk and the financial statements issued in the Business Register of the Czech Republic. The accountancy data of identified business entities, which were or currently are involved in groups of producers are subsequently the subject of financial and statistical analysis. The statistical testing was conducted in software Statistica 10.

The data sample consists of 22 agricultural business entities, which currently are or were members of 4 biggest agricultural producers groups specializing in the commodities fruit and vegetable according to the list of the Ministry of Agriculture of the Czech Republic.

3 Research results

The evidence of Czech agricultural producer groups is only related to the direct beneficiaries of respective subsidies from Horizontal rural development programme or Rural development programme, respectively. Explorative analysis of identified agricultural producers groups within the plant production according to the list of subsidy beneficiaries of the State Agricultural Intervention fund from the Common agricultural policy revealed the following facts. There were identified agricultural producers groups, which are specialized in commodity area plant production using the aforementioned approach. Namely, there were identified specializations of those business entities in commodity areas cereals, oil plants, fruit and vegetable.

The members of agricultural producers groups specialized in commodity area fruit and vegetable were analysed by selected indicators of financial analysis and compared to the respective industry means. The observed time period are years 2004 – 2011. There were applicable the identified financial encouragements of Common agricultural policy in the Czech Republic in this period.

3.1 Cash conversion cycle and profitability of observed producers

The period in which the inputs of production are tied up in the production process until their conversion by sales into the cash flow from customers can be revealed via the financial analysis indicator cash conversion cycle (CCC). Development of the indicator CCC in time period and its comparison to the respective industry mean, using data of Farm accountancy data network (FADN) is shown on Fig. 1. There were identified shorter cash conversion periods for companies, which were concentrated in groups of agricultural producers specialized in fruit and vegetable production, comparing it to the respective industry mean for nearly whole observed time period. Under this assumption it could be stated that the representatives of observed groups of agricultural producers were more effective in transformation of inputs into sales in comparison with peer group of business entities. The reasons for aforementioned result can be found in management of receivables and payables of their members.

The identified development of profitability indicator Return on sales (ROS) comparing it to the respective industry means was different in comparison with the indicator CCC in the observed time period (see Fig. 1). It could be summarized that members of agricultural producers groups were less profitable the peer group especially in years 2007, 2008 and 2011. There can be stated that this fact differs from the basic assumptions regarding the described reasons for creating groups of agricultural producers.
Figure 1 Development of indicators Cash conversion cycle and Return on sales among observed groups of agricultural producers’ representatives specialized in commodity fruit and vegetable in comparison to agricultural industry mean

There is provided insight overlook of profitability development in time period of years 2004 – 2011 among business entities, which actively participated with in groups of agricultural producers specialized in commodity fruit and vegetable (see Fig. 2). Negative development of their profitability, regarding the mean value, was identified after year 2008, which can be considered as period of strong hit of the world financial crisis in the Czech Republic. Mean value of profitability in year 2009 is near to zero and there were observed negative profitability of corporates within the non-outlier range of fruit and vegetable producers.

Figure 2 Box plot of enumerated values of indicator Return on sales within time period of years 2004 – 2011 among observed group of agricultural producers’ representatives

Detailed overlook at the ability of agricultural groups’ participating companies to convert inputs into the cash flows from sales of their products was elaborated in the descriptive box plot (see Fig. 3). It was identified that cash conversion periods differ regarding respective observed business entities.
The ability of corporates to convert inputs into cash flow was negatively influenced after the year 2008. It was prolonged the mean value of cash conversion period from 75 days to more than 100 days. Nevertheless, the identified range of cash conversion cycles’ duration and its maximum values in the year 2009 had overcome 200 days. A strong negative situation is obvious against the sustainable management of working capital in such a case. On the other hand, even in the year 2009 there were identified companies, which were able to convert inputs into cash flow sooner than the inputs are disbursed in about 60 days.

3.2 Statistical verification of financial analysis´ results

There was conducted the statistical testing of hypothesis concerning the similarities/disimilarities of mean values of observed indicator Cash conversion cycle and Return on sales among fruit and vegetable producers, which were involved in the business activities of agricultural producers groups.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>K – S test statistic</th>
<th>P-value</th>
<th>F test statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCC_FADN</td>
<td>K-S d=0.3946</td>
<td>p&lt; 0.15</td>
<td>4.3589</td>
<td>0.0354</td>
</tr>
<tr>
<td>CCC_Producers groups</td>
<td>K-S d=0.1746</td>
<td>p&gt; 0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROS_FADN</td>
<td>K-S d=0.1865</td>
<td>p&gt; 0.20</td>
<td>0.2637</td>
<td>0.0498</td>
</tr>
<tr>
<td>ROS_Producers groups</td>
<td>K-S d=0.1450</td>
<td>p&gt; 0.20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Own processing using data from databases Amadeus and FADN

Tab.1 provides results of normality and homoscedasticity testing as the assumption for conducting the respective indicators´ mean values analysis of variance. The normality of distribution of observed values of indicators Cash conversion cycle and Return on sales was not proved by Kolmogorov-Smirnov test for indicator CCC at industry mean. Homoscedasticity within variances of observed Cash conversion cycle and Return on sales was not proved by the F-test for both indicators. So, the non-parametric t-test of two samples was conducted.

<table>
<thead>
<tr>
<th>Variable</th>
<th>ROS_FADN</th>
<th>ROS_Corp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.6180</td>
<td>7.94097</td>
</tr>
<tr>
<td>variance</td>
<td>5.1800</td>
<td>19.6425</td>
</tr>
<tr>
<td>t statistic</td>
<td>-1.8865</td>
<td></td>
</tr>
<tr>
<td>t critical value</td>
<td>2.2281</td>
<td></td>
</tr>
<tr>
<td>p-value</td>
<td>0.0886</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own processing using data from databases Amadeus and FADN
The results of t-test concerning the indicator Return on sales comparing observed fruit and vegetable producers involved in agricultural producers groups entities against the industry peer group is shown in Tab. 2. It was proved that the mean value of fruit and vegetable producers’ involved in groups of agricultural producers does not statistically differ from the industry peer group mean value of profitability. Nevertheless, the profitability of fruit and vegetable producers was by respective observations lower than the industry mean for prevailing time period.

**Table 3** Two sample t-test with unequal variances concerning the indicator Cash conversion cycle comparing observed agricultural producers group representatives to the industry mean

<table>
<thead>
<tr>
<th>Variable</th>
<th>CCC_FADN</th>
<th>CCC_Corp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>164.0471</td>
<td>76.1724</td>
</tr>
<tr>
<td>variance</td>
<td>5285.7845</td>
<td>1212.6771</td>
</tr>
<tr>
<td>t statistic</td>
<td>3.0832</td>
<td>2.2281</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0116</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own processing using data from databases Amadeus and FADN

Tab. 3 provides results of analysis of variance concerning the indicator Cash conversion cycle as comparison among observed fruit and vegetable producers involved in agricultural producers groups and the respective industry peer group. The analysis of variance results’ regarding the indicator Cash conversion cycle proved that the Cash conversion cycles’ mean value of fruit and vegetable producers’ involved in groups of agricultural producers differs from the industry peer group mean. So observed representatives of agricultural producers groups are more effective in conversion inputs into cash flow regarding sales of their products in comparison with industry mean.

### 4 Conclusions

The objective of this paper was to assess impacts of encouragements for horizontal cooperation among legally independent agricultural producers with prevailing production of fruit and vegetable. The business activities of agricultural producer groups are encouraged using the instruments of EU Common agricultural policy. Namely, it was utilised the Horizontal rural development programme and Rural development programme respectively, to start-up stronger cooperation among agricultural producers in the Czech Republic. The identified agricultural producers groups in previous programming periods (2004 – 2006 and 2007 – 2013) in plant production were specialized in commodities crops, oil plants and fruits and vegetables.

The groups of agricultural producers can be found within the need to create sufficient economic background concerning situations of their financial troubles and to provide management of receivables and payables for member enterprises based on contractual relations. Nevertheless, the conducted financial analysis of companies, which took part in agricultural producers groups proved only partially better economic performance results in aforementioned areas in comparison with industry mean. On the other hand, the strong need to encourage the sustainable development of agricultural producers not only in the Czech Republic opens further discussion on topic of economic cooperation among farmers.

### Acknowledgement

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### References


