COMPARABLE FINANCIAL ANALYSIS AND CONTROL PROCEDURES OF AGRICULTURAL COMPANIES IN RUSSIA AND THE CZECH REPUBLIC

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Abstract. An article is aimed to investigate financial condition of agricultural companies in Russia and the Czech Republic and to estimate acting control procedures. The object of the investigation is accounting reports of both Russian and Czech agricultural companies having average headcounting of regular staff more than 50 persons. The investigation involves the period 2009 - 2015. The number of analyzed companies is 4 317 pcs. Representativity of the data is proved by the X-square method. To estimate financial condition four criteria have been taken: profitability ratios, turnover ratios, liquidity and capital structure ratios. To define differences in financial condition of both countries the T-test method has been used and the significance level is 0.05. The biggest difference is underlining. ROCE demonstrates the biggest difference being 2 times more in Russia than in the Czech Republic. It is caused by bigger share of long-term capital in Russia by comparison with the Czech Republic. Credit period in Russia is 2 times longer than in the Czech Republic due to availability of credits and absence of available cash assets to pay to suppliers or at the moment of making deals. Liquidity ratio is 2 time less in Russia than in the Czech Republic. Reliability of accounting reports is of big importance too. Some control procedures are proposed in the article.

Key words: controlling, statistical analysis, internal audit, internal control

JEL code: Q14, M42

Introduction
Stable agriculture is an insurance of the country’s food security. Profitable agricultural companies provide the country with food without import.

In Russia, there is a trend to amalgamate and integrate agricultural companies (Butorin S., 2016). It is caused by some reasons. Agricultural industry has traditionally weak profitability in comparison with other industries (Melnik M., 2017). In Russia, depending on the region, average profitability is about zero or negative without state support (Ministry of Agriculture, 2016).

Business activity of agricultural companies is to be controlled by outer side and internally. Internal control, however, is mostly formal (Alborov R., et.al, 2013). At the same time reliable and correct accounting reports help take reasonable managerial decisions (Kontsevaya S., 2014).

Data description
The object of the investigation is accounting reports of both Russian and Czech agricultural companies having average headcounting of regular staff more than 50 persons. The data is taken from Amadeus database. The database contains comparable harmonized accounting data of individual companies in all branches. It was selected panel data from NACE Rev. 2 (Code C01). The investigated period is 2009-2015. The number of analysed companies is 4317 pcs. (359 companies in the Czech Republic and 3957 companies in Russia). Financial condition of the companies has been estimated by means of nine financial indicators. Only relative amounts but not actual ones have been taken. Besides the period of 7 years has been investigated in order to smooth misrepresentation in reports as during the last two years 2014 and 2015 Russia suffered from falling in the exchange rate and political decision about food embargo. The indicators presented below are the most important aspects of financial condition of the company (Bureau van Dijk, 2016):

- Profitability ratios - Return on Capital Employed, Return on Assets, Profit margin;
- Turnover ratios – Assets turnover, Collection period, Credit period;
- Liquidity ratios - Current ratio, Liquidity ratio (Asset based);
- Capital structure - Solvency ratio.

The software used for calculations is STATA13. The authors realize the fact that the investigation does not take into account such
important factor for the estimation of the company as land area. This factor is not presented in the database Amadeus. This factor is expected to be taken into account in further investigations.

The aim of the research is to investigate and compare financial condition of the agricultural companies in Russia and in the Czech Republic over the period 2009 - 2015.

The tasks of the research:
- short review of current condition of agriculture in Russian and in Europe;
- scientifically based statistical selection from accounting data of individual agricultural companies (average headcounting more than 50 persons) in Russia and in the Czech Republic;
- estimation of financial condition of agricultural companies has been carried out by means of statistical check of the hypothesis: the investigation provides the reasons of difference between financial indicators in Russia and in the Czech Republic;
- the control procedures improving reliability of accounting reports of the companies are proposed in the article.

The hypothesis of the research: The null hypothesis: there is no any differences between financial conditions of Russian and Czech companies. Alternative hypothesis: there is a significant difference in financial condition between Russian and Czech companies.

Research results and discussion
1. Estimation of current condition of agriculture in Russia and European Union countries

Russia occupies an area of 17 mil. square km. It involves four climate zones: arctic, subarctic, moderate and tropical. It embarrasses comparison between agriculture in Russia and in Europe as European countries are mostly situated in one climate zone. Agriculture depends on weather conditions. The following countries have been chosen in order to investigate and compare with Russia (RU):
- developed markets - Germany (DE), France (FR);
- European countries from the Soviet bloc - the Czech Republic (CZ), Poland (PL);
- countries with Northern climate conditions - Finland (FI).

The results of the comparison are presented in the Table 1.

Table 1

<table>
<thead>
<tr>
<th>Country</th>
<th>Total country population, mil.units</th>
<th>Agri area, mil. ha</th>
<th>Agri hold., units</th>
<th>Labour force per 1 agri hold., units</th>
<th>Agri area per 1 hold., ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>11</td>
<td>3</td>
<td>26</td>
<td>4</td>
<td>133</td>
</tr>
<tr>
<td>DE</td>
<td>81</td>
<td>17</td>
<td>285</td>
<td>2</td>
<td>59</td>
</tr>
<tr>
<td>FR</td>
<td>66</td>
<td>28</td>
<td>472</td>
<td>2</td>
<td>59</td>
</tr>
<tr>
<td>PL</td>
<td>38</td>
<td>14</td>
<td>1 429</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>FI</td>
<td>5</td>
<td>2</td>
<td>54</td>
<td>1</td>
<td>42</td>
</tr>
<tr>
<td>RU</td>
<td>144</td>
<td>191</td>
<td>20</td>
<td>140</td>
<td>9 483</td>
</tr>
</tbody>
</table>

Source: author’s calculations based on Eurostat, Rosstat

It should be mentioned that comparison between Russian and European agricultural companies is quite complicated. In Russia there are mostly large agricultural holdings but in Europe the agricultural companies are mostly small sized with small headcounting and lands. The most suitable country to compare with Russia is the Czech Republic. Moreover, abovementioned European countries (except for the Czech Republic) have unrepresentative number of suitable companies with headcounting more than 50 persons in the Amadeus database.

The amount of investigated selection is presented in the Table 2. The selection contains major and average companies with headcounting more than 50 persons. Representativity of the data has been validated by means of the
**X-square method.** The calculation is in the Table 3.

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Agricultural Output (mil Euro)</th>
<th>Sample</th>
<th>Share, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>4,835.85</td>
<td>2,315.97</td>
<td>47.87</td>
</tr>
<tr>
<td>RU</td>
<td>46,088.16</td>
<td>17,078.02</td>
<td>37.06</td>
</tr>
</tbody>
</table>

**Total number of holdings (units)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Sample</th>
<th>Share, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>26,250</td>
<td>47.87</td>
</tr>
<tr>
<td>RU</td>
<td>20,160</td>
<td>37.06</td>
</tr>
</tbody>
</table>

Source: author’s calculations based on Eurostat, Rosstat, Amadeus database

### Table 3

**Calculation X² test on base Operation revenue in each country, bil, EUR**

<table>
<thead>
<tr>
<th>Country</th>
<th>Sample, company, C</th>
<th>Sample, %</th>
<th>Total amount, C</th>
<th>Total amount, %</th>
<th>Expected number of cases</th>
<th>X² square</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>2.3</td>
<td>11.9</td>
<td>4.8</td>
<td>9.5</td>
<td>1.8</td>
<td>0.122</td>
</tr>
<tr>
<td>RU</td>
<td>17.1</td>
<td>88.1</td>
<td>46.1</td>
<td>90.5</td>
<td>17.6</td>
<td>0.013</td>
</tr>
<tr>
<td>Σ</td>
<td>19.4</td>
<td>100</td>
<td>50.9</td>
<td>100</td>
<td>19.4</td>
<td>0.134</td>
</tr>
</tbody>
</table>

Degrees of freedom=1
Ho: ratio=3.841; Ha: ratio !=3.841;
P-value less than 0.05
Source: author’s calculations based on Eurostat, Rosstat, Amadeus database

The total sum of Chi-Square is 0.134, but to reject the null hypothesis with 1 degrees of freedom, Chi-Square must be more than 3841. Thereby, the null hypothesis should not be rejected. The null hypothesis means, that observed number of cases in each country is exactly equal to the expected number of cases in each country. The dataset sample completely represents the whole population.

Characteristics of basic dataset of both countries are aggregated in the Table 4. Size of a company is measured by turnover (operating revenues) and total assets in thousands EUR. Profit is measured by Earnings before Taxes (EBT) in thousands EUR. Standard deviation is obviously more in Russia than in the Czech Republic but mean is approximately equal.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn-over</td>
<td>359</td>
<td>6451</td>
<td>6120</td>
<td>970</td>
<td>52277</td>
</tr>
<tr>
<td>Assets</td>
<td>359</td>
<td>8790</td>
<td>6460</td>
<td>900</td>
<td>48085</td>
</tr>
<tr>
<td>EBT</td>
<td>359</td>
<td>408</td>
<td>640</td>
<td>-199</td>
<td>6386</td>
</tr>
<tr>
<td>RU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn-over</td>
<td>3957</td>
<td>4315</td>
<td>19377</td>
<td>2</td>
<td>708190</td>
</tr>
<tr>
<td>Assets</td>
<td>3957</td>
<td>7975</td>
<td>24018</td>
<td>24</td>
<td>616648</td>
</tr>
<tr>
<td>EBT</td>
<td>3957</td>
<td>310</td>
<td>1754</td>
<td>29074</td>
<td>44251</td>
</tr>
</tbody>
</table>

Source: author’s calculations based on Amadeus database

#### 2. Statistical test

An average amount of each financial indicator has been calculated over the period of 2009 - 2015. So, each company has one average value for each of 9 financial indicators used for statistical analysis.

Outliers of each financial indicator have been removed so the number of observations depends on the particular case.

In order to visually estimate normal distribution, the density diagram has been constructed for each indicator. The box plot has also been constructed for each indicator in order to visually demonstrate difference between indicators of both countries.

The T-test is utilized to compare two groups of indicators. If the p-value of the difference ratio test is less than the chosen alpha level (α=0.05), then the null hypothesis of no difference between the two groups is rejected.

The results of the analysis are presented in the Tables 5-13.

Statistical analysis made by means of the T-test suggests that there is statistically significant difference between financial indicators of Russia...
and the Czech Republic. This fact rejects the null hypothesis about equality of these two groups.

ROCE is very important indicators for estimation of company’s revenue power.

Table 5

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Std. Dev.</th>
<th>[95 % Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>5.0602</td>
<td>.1752</td>
<td>3.2306</td>
<td>4.7156</td>
</tr>
</tbody>
</table>

\(\text{Diff} = \text{mean}(\text{CZ}) - \text{mean}(\text{RU})\)

\(\text{Ho: } \text{diff}=0; \text{ Ha: } \text{diff} \neq 0; \text{ P-value}=0.0000\)

Source: author’s calculations based on Amadeus database

Table 6

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Std. Dev.</th>
<th>[95 % Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>3.7299</td>
<td>.1560</td>
<td>2.898</td>
<td>3.4231</td>
</tr>
<tr>
<td>RU</td>
<td>4.6156</td>
<td>.1174</td>
<td>7.2786</td>
<td>4.3853</td>
</tr>
</tbody>
</table>

\(\text{Diff} = \text{mean}(\text{CZ}) - \text{mean}(\text{RU})\)

\(\text{Ho: } \text{diff}=0; \text{ Ha: } \text{diff} \neq 0; \text{ P-value}=0.0000\)

Source: author’s calculations based on Amadeus database

Return on Assets (ROA, %)=(Profit before tax / Total assets) * 100

Value of this indicator is not so different in the investigated countries as ROCE. ROA depends on profit margin and assets turnover.

Table 7

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Std. Dev.</th>
<th>[95 % Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>5.2438</td>
<td>.2386</td>
<td>4.4968</td>
<td>4.7744</td>
</tr>
<tr>
<td>RU</td>
<td>6.8936</td>
<td>.1954</td>
<td>11.928</td>
<td>6.5103</td>
</tr>
</tbody>
</table>

\(\text{Diff} = \text{mean}(\text{CZ}) - \text{mean}(\text{RU})\)

\(\text{Ho: } \text{diff}=0; \text{ Ha: } \text{diff} \neq 0; \text{ P-value}=0.0000\)

Source: author’s calculations based on Amadeus database

Profit margin(%)=(Profit before tax / Operating revenue) * 100

Profit margin is expressed as a percentage and, in effect, measures how much out of every monetary unit of sales a company actually keeps in earnings. It is strongly affected by input-output efficiency, price setting and cost management (Spicka J., et.al., 2016).
Value of profit margin proves that Russian agricultural companies get more profit from one unit of the product. Some companies are unprofitable and the share of these companies is bigger in Russia than in the Czech Republic which is shown in Fig. 3.

It should be taken into account that actual profit is less due to inflation in Russia. Production process in the agricultural companies functions according to the postponed scheme i.e. costs of the current year will be covered by profit of the next year. However, actual profit will be decreased by high inflation.

This indicator is higher in the Czech Republic than in Russia. It might be caused by different climate conditions, which provide 2-3 crops per year in the Czech Republic (i.e. the capacities are used intensively) unlike the situation in Russia where only 1 crop per year is possible.

The indicators’ collection period and credit period define effectiveness of debts management in the company.

The collection period is the number of days between product shipment and completed payment for shipped products.

Collection period (days)=(Debtors / Operating revenue) * 360

The less this period, the more active financial flows and thus the better this situation is for the company. As quickly obtained money is possible to use in business activity immediately, long period of money retrieval does not support
development of the company. Big collection period is caused by strong monopolization of agricultural products processors, which sometimes might be single customers. Consequently, they are able to dictate unfavorable conditions to their suppliers.

Table 10

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Std. Dev.</th>
<th>[95 % Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>RU</td>
<td>42.9755</td>
<td>.550</td>
<td>31.569</td>
<td>41.896 - 44.054</td>
</tr>
</tbody>
</table>

Diff=mean(CZ) - mean(RU)
Ho: diff=0; Ha: diff !=0; P-value=0.0000
Source: author's calculations based on Amadeus database

Credit period (days)=(Creditors / Operating revenue) * 360

Credit period is the period of time between purchases and complete payment for purchased products. The longer period between these events, the better this situation for the company. Long credit period may be caused by good relations between agricultural companies and their suppliers.

Fig. 6. Box plot Credit period (days)

Credit period in Russia is two times longer than in Europe. It may be explained by the fact that agricultural companies have no available money for concluding purchases and making contracts with delayed payment. As soon as money for crop is obtained, the payment is expected to be effected. For instance, fuel for sowing season is supplied in spring but paid as soon as grain is collected and sold. One more reason of long credit period may be explained by popularity of credits in Russia. Delayed payment is not profitable and favorable to suppliers due to high inflation, and some suppliers work with complete pre-payment for delivered products. In this case, agricultural companies use credits. For instance, in the biggest bank "Rosselkhozbank" specialized in collaboration with agricultural companies there is special credit programme "On security of further yield". The bank provides the credit to pay costs in sowing season and when yield is collected this credit is paid.

Table 11

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Std. Dev.</th>
<th>[95 % Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>3.2096</td>
<td>.0898</td>
<td>1.5719</td>
<td>3.0328 - 3.3864</td>
</tr>
<tr>
<td>RU</td>
<td>3.0030</td>
<td>.0338</td>
<td>1.8606</td>
<td>2.9365 - 3.0695</td>
</tr>
</tbody>
</table>

Diff=mean(CZ) - mean(RU)
Ho: diff=0; Ha: diff !=0; P-value=0.0321
Source: author's calculations based on Amadeus database

Current ratio (x)=Current assets / Current liabilities

This coefficient demonstrates ability of the company to discharge its current (short term) liabilities by means of current assets only. The bigger is this coefficient the better is paying capacity of the company (Savitskaya G., 2005). The higher is this coefficient the better working capital management. The result of the analysis
proves that management in the Czech Republic is more effective than in Russia.

This coefficient demonstrates ability of the company to discharge its current liabilities in case of difficulties with disposal of products using different funds on bank accounts, short-dated securities, and funds from debtors. The higher is this indicator the better solvency of the company. Normal value of this indicator is (0.6-1.0). This indicator is 2 times lower in Russia than in the Czech Republic.

This coefficient is additional to the previous one.

Solvency ratio depends on the capital structure. The higher is this indicator the higher internal financing. It is quite important for the company, especially in the time of crisis. However, if the company relies only on internal capital, it neglects the opportunity of production development by means of loan capital.

Table 13

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Std. Dev.</th>
<th>[95 % Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>65.4474</td>
<td>.799</td>
<td>14.999</td>
<td>63.875 - 67.019</td>
</tr>
<tr>
<td>RU</td>
<td>58.0353</td>
<td>.416</td>
<td>26.184</td>
<td>57.217 - 58.852</td>
</tr>
</tbody>
</table>

\[
\text{Diff} = \text{mean}(\text{CZ}) - \text{mean}(\text{RU})
\]

Ho: diff=0; Ha: diff \neq 0; P-value=0.0000

Source: author’s calculations based on Amadeus database

1) Preliminary control provides justification and legal order of facts concerning business activity of the company presented in the reports. It is to be done, firstly, by an auditing committee of the agricultural company taking into account all objective conditions.

2) Routine control provides completeness and accuracy of the records about business events in the reports. This type of control is intended to avoid illegal operations in business activity.

3) Follow-up control is used to prove validity of records about operations. Control boards of both the company and Ministry of Agriculture may perform this type of control.

4) The following methods and techniques can be utilized for preliminary, routine and follow-up control: examination of documents, control of
justification, legal order and completeness of obtained financial assets, proper use of financial assets, traceability of performed financial and business operations, verification of reasonable use of these assets, recalculations validating arithmetic truth, observations and inspection of business operations.

Conclusions

This article is aimed to estimate financial condition of the agricultural companies in Russia and the Czech Republic over the period 2009-2015.

1) According to the results of the analysis Russian agricultural companies have higher profitability than Czech ones. ROCE in Russia is two times more than in the Czech Republic due to different capital structure. Russian companies use significantly more loan assets and credits for shareholder funds. Investigated period coincided with credit boom in Russia. ROA and profit margin in Russia is a little bit higher than in the Czech Republic. Russian companies obtain more profit per product unit than in the Czech Republic.

2) Credit period in Russia is two times longer than in the Czech Republic that is explained by availability of credits and absence of available cash for immediate payment for delivered products in Russia. Collection period is longer in the Czech Republic because of strong monopolization from customers' side.

3) Liquidity ratio proves that working capital management is more efficient in the Czech Republic, the companies are of greater stability and internal capital prevails in the capital structure.

4) Control procedures are necessary to perform control of financial reports, which is used to take managerial decisions. The types of control are preliminary, routine and follow-up. The opportunity for next research would be benchmarking study of the agricultural companies in Russia and Central Europe using the factor of land area.

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Bibliography


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