1. COMPARATIVE ANALYSIS OF COMPETITIVE ADVANTAGES OF RUSSIAN FERTILIZER COMPANIES

1.1. Introduction

The use of fertilizers increased vastly over the twentieth century, and fertilizer use is forecast to continue growing also in the near future (Enger, 2010). Global consumption of fertilizers in the agricultural years (beginning of July - end of June) 2009-2016 is presented in Figure 1. The dynamic growth of consumption of fertilizers is seen in all three segments. The greatest increase is observed for nitrogen fertilizers, which are the most commonly used fertilizer worldwide.

![Global consumption of fertilizers (agricultural years) [mln tonnes]](image)

Fig. 1. Global consumption of fertilizers (agricultural years) [mln tonnes]

Limited supply caused by resource exhaustibility influence the market situation as well. Thus, attractive industry fundamentals determine steady growth in demand for fertilizers in the long term (Ilinova, Dmitrieva, 2017).
Russia accounts for about 10% of world production of fertilizers. Products of the Russian fertilizer industry (due to the unique natural resources) are characterized by high quality and competitive price as a whole (Dmitrieva, 2016).

Due to the launch of new production facilities (capacity growth) and increased competition, the position of suppliers in the structure of world trade has changed in recent years.

The world market is characterized by very intense competition. According to the International Fertilizer Association, by 2018, it is expected a significant increase of production capacity of nitrogen fertilizers in East Asia (China, Indonesia), Eastern Europe (Russia), North America (USA), Africa (Algeria, Egypt, Nigeria). In the phosphorous segment, Saudi Arabia (+3.5 million tons per year in 2017) and Morocco (+1.8 million tons per year) will provide the main capacity growth. There are other projects (including in the CIS countries – in Kazakhstan and Uzbekistan), but precise data on launch dates and capacities are not yet available. In the potash market the largest project is being implemented in Canada (Jansen, 8 million tons), but now there is no clarity with the timing. Russian companies “Acron” and “EuroChem” are actively working on the construction of new mines. In 2018, new mines are expected to be commissioned in Canada (“K+S Kali”, 2.8 million tons) and Turkmenistan (“Turkmen chemistry”, 1.4 million tons). In 2020 it is also expected capacity expansion in Belarus. Important for the market is the announcement of the discovery of potash salt deposits in China.

Increased competition in the world market of mineral fertilizers will complicate the position of Russian companies. In order to maintain leading positions Russian companies need to gain and develop sustainable competitive advantages. Therefore, the purpose of the research is to reveal main competitive advantages of Russian fertilizer companies and to compare them using suggested model in order to find more sustainable.

1.2. Literature studies

Nowadays, there are a lot of theoretical and methodological approaches and research studies devoted to competitive advantages of the companies: their creation, development and maintaining. In traditional approach to strategic management, competitive advantage is described as something that helps a company consistently
Comparative analysis of competitive advantages…

earn a higher rate of return than its competitors (Porter, 1980; Porter, 1985; Grant, 1995; Schoemaker, 1990). Some authors define competitive advantage as a quality that distinguishes the company from others and keeps it going and growing (Smith and Flanagan, 2006).

Nowadays, companies should not only improve their adaptability and flexibility (Nilson and Rapp, 2005; Wei, et al., 2017; Ponomarenko, 2016; Nevskaya and Marinina, 2017), but also develop the strategy with the main goal to gain and boost competitive advantages (Švárová and Vrchota, 2014; Gyampah and Acquaah, 2008).

However, in times of globalization and intensive business competition it becomes more and more difficult to gain and maintain competitive advantages (Brown and Eisenhardt, 1998; D’Aveni, 1994; Nilsson and Dernroth, 1995; Eisenhardt and Martin, 2000; Hamel, 2000). It is because almost all of them (resources, technologies, information etc.) can be copied and replicated by competitors (Goldsmith, 2013; Singh, 2012).

Previous studies, devoted to mineral fertilizers market, have addressed fertilizer markets and forecasts of fertilizer consumption (Al Rawashdeh, 2011; Al Rawashdeh, 2016; Geman, 2013), development of phosphate and potash resources and reserves (Mew, 2016; Ciceri, 2015; Cooper, 2011). The past research also addressed the evolution of the fertilizer market and its forecasting in the coming decades (Al Rawashdeh, 2014) as well as fertilizer availability in a resource-limited world (Dawson, 2011). In addition, the research has tackled capital investment in fertilizer companies (Geman, 2013), supply behavior of state mining enterprises (Al Rawashdeh, 2008), and efficiency performance of the leading phosphate rock mining companies (Geissler, 2015).

Competitive advantages of fertilizer mining companies could be classified by degree of their sustainability (sustainable and non-sustainable (unsustainable)). The research of sustainability of competitive advantages is a widespread subject of research in academic debates. There are many previous studies devoted to sustainable competitive advantages (Chaharbaghi and Lynch, 1999; Takalaa, 2013; Kotabe, 2014 among many others).

In general, in the theory of sustainable competitive advantages, sustainability is an attribute of advantage that shows whether competitors can copy it or not. There
are many definitions of sustainable competitive advantages (Grant, 1995; Chaharbaghi and Lynch, 1999; Barney et al., 1991; Barney et al., 2001; Liu, 2013).

However, there are no research papers focusing specifically on the creation and development of competitive advantages of fertilizer mining companies. Moreover, despite the wide range of scientific works devoted to sustainable competitive advantages, there is no opportunity to measure the sustainability of competitive advantages for fertilizer companies and other companies.

1.3. Methodology

Analyzing and synthesizing previous researches concerning characteristics of sustainability of competitive advantages (Grant, 1995; Chaharbaghi and Lynch, 1999; Barney, 1991) we suggest use three indicators for sustainability of competitive advantages evaluation - possibility of competitive advantages copying (replicability), time for competitive advantages invention/implementation and resource intensity of competitive advantages implementation (Tab. 1).

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Symbol</th>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possibility of competitive advantages copying</td>
<td>P</td>
<td>Shows if it is possible to copy competitive advantages and analytical measure of possibility.</td>
<td>It is an evaluation of possibility of company’s competitive advantages copying or substitution by competitors. If competitive advantage is easy to copy and there is no possibility to protect intellectual property this determinant take the value 0. If it is impossible to copy competitive advantage the determinant take the value 1.</td>
</tr>
<tr>
<td>Time for competitive advantages invention/implementation</td>
<td>T</td>
<td>Measure of time needed by competitor to achieve competitive advantages and implement it.</td>
<td>It is an evaluation of time needed to achieve competitive advantage. More time needed, closer to 1 is the determinant’s value.</td>
</tr>
<tr>
<td>Resource intensity of competitive advantages implementation</td>
<td>R</td>
<td>Shows how much resources competitors need for implementing competitive advantage.</td>
<td>It is a measure of amount of resources (financial, human etc.) that competitors need to get competitive advantage and sustain it in turbulent environment More resources needed, closer to 1 is the determinant’s value.</td>
</tr>
</tbody>
</table>

Source: own study.
Comparative analysis of competitive advantages…

Takalaa (2013) suggest in his research strategy triangle and resource triangle, using that idea in order to evaluate sustainability of competitive advantages by three determinants we suggest to construct the triangle of sustainability of competitive advantages where the sides would be the determinants P, T, R (the example you can see on the Fig. 2).

We have three determinants, which are unidirectional – the bigger value each of them takes - more sustainability the competitive advantage has. So, the bigger the area of a triangle the higher level of sustainability the competitive advantage has. The main idea – is to evaluate level of competitive advantages sustainability using these determinants and reveal more and less sustainable competitive advantage for fertilizers companies in order to create competitive strategy. The implementation of that concept is given in the next paragraph.

Fig. 2. The concept of the triangle of sustainability of competitive advantages (an example)
Rys. 2. Koncepcja trójkąta trwałej przewagi konkurencyjnej (przykład)
Source: own study.

1.4. Research results

Intense competition forces fertilizer companies to search for sustainable competitive advantages in order to hold or strengthen their market position. Under such circumstances situation, it is important to understand the sustainability of particular competitive advantages (Ilinova and Dmitrieva, 2017). First, we need to identify main competitive advantages of fertilizer companies. There are many factors
contributing to the competitive advantages of producers of mineral fertilizers (Dmitrieva and Ilinova, 2016; Ilinova and Dmitrieva, 2017; Dmitrieva at al., 2017). Using market peculiarities of fertilizer industry (Dmitrieva, 2016) and features of Russian raw material base (Pashkevich et al., 2014) the main sources of competitive advantages, their components and results of their implementation were established (Table 2). After that, we need to compare competitive advantages.

Table 2
Creation of competitive advantages in fertilizer companies

<table>
<thead>
<tr>
<th>Sources of competitive advantage</th>
<th>Competitive advantages</th>
<th>Result of implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral resources</td>
<td>Access to all kinds of mineral resources&lt;br&gt;Mineral raw material independence of the company&lt;br&gt;Access to unique mineral resources</td>
<td>Low production expenses&lt;br&gt;High quality of products</td>
</tr>
<tr>
<td>Possibility to create large vertically integrated companies</td>
<td>Vertically integrated business model of the company</td>
<td>Effective planning and management of all the chain of value creation, effect of synergy and low production expenses</td>
</tr>
<tr>
<td>Possibility to transform the production system depending on the demand for mineral fertilizers by types</td>
<td>Flexible business model allowing for a quick change of the production structure</td>
<td>High production and sales efficiency</td>
</tr>
<tr>
<td>Possibility to transform the sales system depending on the demand for mineral fertilizers by regions</td>
<td>Flexible sales model allowing for a quick change of delivery regions</td>
<td>High production and sales efficiency</td>
</tr>
<tr>
<td>Possibility to develop a logistic system to optimize the costs</td>
<td>Effective logistic system (with own assets)</td>
<td>Low expenses on transport, timely delivery of goods</td>
</tr>
<tr>
<td>Possibility to develop company’s own distribution system</td>
<td>Own distribution system</td>
<td>Low expenses on distribution, timely delivery of goods, proximity to final buyers, satisfaction of individual inquiries of buyers</td>
</tr>
<tr>
<td>Diversification and production of different types of mineral fertilizers</td>
<td>Wide product range</td>
<td>Ability to satisfy demand of a large number of consumers, high profit margin, decreasing risk</td>
</tr>
<tr>
<td>Possibility to participate in social and cultural infrastructural programs in the region</td>
<td>Implementation of social and infrastructural programs in the region</td>
<td>Good reputation of the company, involvement of labor, increased level of corporate social responsibility</td>
</tr>
<tr>
<td>Fluctuation of currencies</td>
<td>Low cost of production in relation to the world market</td>
<td>Additional profit / increase in sales caused by reduction of prices</td>
</tr>
</tbody>
</table>

Source: own study.
As we have already stated, competitive advantages can be sustainable, conditionally sustainable and non-sustainable (Chaharbaghi and Lynch, 1999; Takalaa, 2013; Kotabe, 2014).

In order to evaluate the sustainability of competitive advantages of fertilizer companies we used the suggested model. For that purpose, competitive advantages listed in Table 2 were characterized using determinants (P, T, R) and the areas of a triangles (S) were calculated.

A group of experts (decision-makers) was involved in the evaluation of sustainability characteristics of competitive advantages. It brought together three specialists in business management, who have considerable experience in forecasting, planning and managing companies in this specific industry, as well as two specialists (senior consultants) in consulting and analytical agencies dealing with such issues. The results of evaluation presented in Table 3.

<table>
<thead>
<tr>
<th>No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>0.8</td>
<td>0.7</td>
<td>0.7</td>
<td>0.6</td>
<td>0.3</td>
<td>0.4</td>
<td>0.2</td>
<td>0.1</td>
<td>0.4</td>
<td>0.3</td>
<td>0.1</td>
</tr>
<tr>
<td>T</td>
<td>0.8</td>
<td>0.9</td>
<td>0.6</td>
<td>0.4</td>
<td>0.7</td>
<td>0.6</td>
<td>0.4</td>
<td>0.3</td>
<td>0.5</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>R</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
<td>0.5</td>
<td>0.5</td>
<td>0.4</td>
<td>0.2</td>
<td>0.2</td>
<td>0.5</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>S</td>
<td>7.6974</td>
<td>7.7658</td>
<td>5.9618</td>
<td>3.0753</td>
<td>3.2827</td>
<td>2.7035</td>
<td>0.93484</td>
<td>0.5504939</td>
<td>2.6430</td>
<td>1.6410</td>
<td>0.3595</td>
</tr>
</tbody>
</table>

Source: compiled by the authors (1 - Access to all kinds of mineral resources, 2 - Mineral raw independence of the company, 3 - Access to unique mineral resources, 4 - The vertically integrated business model of the company, 5 - The flexible production business model allowing to change structure of production quickly, 6 - The flexible sale business model allowing to change regions of deliveries quickly, 7 - Existence of effective logistic system (with own assets), 8 - Existence of own distribution system, 9 - Wide product range, 10 - Implementation of programs for development of social facilities and infrastructure in the region, 11 - Low cost of production in relation to the world market).

The triangles of sustainability of competitive advantages were built (Fig. 3). The concept of triangle was used because it helps not only to reveal more and less sustainable competitive advantages but also to present more informative each of it.

As it was mentioned competitive advantages could be sustainable and non-sustainable (Chaharbaghi and Lynch, 1999; Takalaa, 2013; Kotabe, 2014 among many others). Also in high environmental turbulence (Ilinova and Dmitrieva, 2017), some competitive advantages that seems to be sustainable could become non-sustainable.
(conditionally sustainable). For fertilizers companies possibility of competitive advantages copying (replicability), time for competitive advantages invention/implementation and resource intensity of competitive advantages implementation have equal significance for evaluation sustainability of competitive advantages. Each of them could take the value from 0 to 1, were 0 determine competitive advantage which is easy to copy without spending a lot of time and resources, and 1 determine competitive advantage that is impossible to copy or it will take a lot of time and resources. So, for these determinants we make convention: if each of determinant take value from 0 to 0.33 competitive advantage determined as non-sustainable, from 0.33 to 0.66 – conditionally sustainable, from 0.66 to 1 – sustainable (three levels of competitive advantages sustainability). Calculating areas of triangles for fertilizer companies, the follows convention could be made:

- $0 < F(P, T, R) \leq 1.3098$ – the competitive advantage of fertilizer company considered as non-sustainable,
- $1.3098 < F(P, T, R) \leq 5.2391$ – the competitive advantage of fertilizer company considered as conditionally sustainable,
- $5.2391 < F(P, T, R) \leq 12.0273$ the competitive advantage of fertilizer company considered as sustainable.

Using this classification the following conclusions could be done about sustainability of competitive advantages of fertilizers companies: 1,2,3 – it is sustainable competitive advantages; 4,5,6,9,10 - conditionally sustainable competitive advantages; 7,8,11 - non-sustainable competitive advantages.

Table 4 presents sustainability of competitive advantages of Russian fertilizers companies with examples of the Russian companies that have these competitive advantages. In addition, table presents possible results of competitive advantages realization for companies.
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Fig. 3. Triangles of sustainability of competitive advantages for fertilizers companies
Rys. 3. Trójkąty trwałej przewagi konkurencyjnej dla firm nawozowych
Source: own study (1 - Access to all kinds of mineral resources, 2 - Mineral raw independence of the company, 3 - Access to unique mineral resources, 4 - The vertically integrated business model of the company, 5 - The flexible production business model allowing to change structure of production quickly, 6 - The flexible sale business model allowing to change regions of deliveries quickly, 7 - Existence of effective logistic system (with own assets), 8 - Existence of own distribution system, 9 - Wide product range, 10 - Implementation of programs for development of social facilities and infrastructure in the region, 11 - Low cost of production in relation to the world market).

Table 4
Sustainability of competitive advantages of Russian fertilizers companies in high environmental turbulence

<table>
<thead>
<tr>
<th>Competitive advantages</th>
<th>Sustainability of competitive advantage</th>
<th>Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to all kinds of mineral resources</td>
<td>Sustainable (S=7,6974) Realization of competitive advantage allows companies produce all kinds of fertilizers and not depend from supplies. It is the most sustainable competitive advantage in fertilizers industry.</td>
<td>None of Russian companies</td>
</tr>
<tr>
<td>Mineral raw independence of the company</td>
<td>Sustainable (S=7,7658) Realization of competitive advantage allows companies operate in its own rhythm without dependence from terms and conditions of supplies</td>
<td>PhosAgro, Uralkali, Evrochem</td>
</tr>
<tr>
<td>Competitive advantages</td>
<td>Sustainability of competitive advantage</td>
<td>Companies</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------------</td>
<td>-----------</td>
</tr>
</tbody>
</table>
| Access to unique mineral resources | Sustainable (S=5,9618)  
Realization of competitive advantage allows companies produce and supply unique product to market or define conditions in case of providing rivals with this resource. It is almost impossible to copy that competitive advantage | PhosAgro, Uralkali |
| The vertically integrated business model of the company | Conditionally sustainable (S=3,0753)  
This competitive advantage is easy to copy and almost all fertilizers companies in Russia already has it because it provide lower costs and independence in operational activity | PhosAgro, Evrochem, Akron, Uralkali |
| The flexible production business model allowing to change structure of production quickly | Conditionally sustainable (S=3,2827)  
It is possible to copy that competitive advantage, but it requires resources. At the same time it helps company to satisfy the actual demand of consumers | PhosAgro |
| The flexible sale business model allowing to change regions of deliveries quickly | Conditionally sustainable (S=2,7035)  
It is possible to copy but requires resources and time because of remoteness of places of consumption from places of production for fertilizers companies. | PhosAgro, Uralkali |
| Existence of effective logistic system (with own assets) | Non-sustainable (S=0,9348)  
It is easy to copy this competitive advantage for rivals and it is not requires many time. | PhosAgro, Uralkali, Evrochem |
| Existence of own distribution system | Non-sustainable (S=0,5505)  
It is easy to copy this competitive advantage for rivals and it is not requires many time | Uralkali, PhosAgro |
| Wide product range | Conditionally sustainable (S=2,6430)  
For fertilizers companies product range is restricted by availability of mineral resources, so to have this competitive advantage company need firstly to get access to resources. | PhosAgro, Evrochem, Akron |
| Implementation of programs for development of social facilities and infrastructure in the region | Conditionally sustainable (S=1,6410)  
It is possible to copy, but at the same time requires effective management system to use it for companies’ benefit. | Akron, PhosAgro, Uralkali, Evrochem, Uralchem |
| Low cost of production in relation to the world market | Non-sustainable (S=0,3595)  
This competitive advantage is appears mainly due to the depreciation of the ruble to the dollar. This situation allows companies either to reduce the price for foreign consumers, or to get additional profit. But in high environmental turbulence this competitive advantage could be lost fast. | PhosAgro, Uralkali, Uralchem |

Source: own study.
As it seen from the Table 4, Russian fertilizers companies that have sustainable competitive advantages (PhosAgro, Uralkali, Evrochem) have more competitive power than their competitors do. In addition, it was found that company PhosAgro has almost all competitive advantages that allows it get leading positions at the market. Companies Evrochem and Uralchem need to develop sustainable competitive advantages or to find other directions to increase their competitiveness.

1.5. Conclusions

Sector-specific market and industry features and high level of turbulence of its external environment connected with complexity and huge amount of unexpected and unpredictable changes in prices, demand, behavior of competitors, policy regulation, etc. characterize the fertilizer industry.

Russian fertilizer companies enjoy a significant share of the global fertilizer market. However, the competitive advantages of Russian manufacturers, which are largely resource-based, can be partially or completely lost, because the Russian companies keep their competitiveness to a large extent through high quality raw materials, but not through increasing of their production and management efficiency.

Our approach for a discussion on strategic development of fertilizers companies based on necessity to create and develop sustainable competitive advantages, which are steady basis for successful development of the companies. Fertilizers companies have to focus precisely on the competitive advantages, which are the most sustainable. In this way, important issue is to separate sustainable and non-sustainable among a set of advantages. In particular, relevant issue is to formulate conceptual approach and suitable tools allowing identify sustainability of advantage. In this paper, we made an effort to solve this problem.

Our research focuses on investigation of main types of competitive advantages of fertilizers companies and creation of model for assessment of degree of their sustainability, which is necessary in order that all resources and efforts of the company have to be directed to receiving, development and deduction of sustainable difficult copied advantages. Concentration of the company on sustainable competitive advantages allows cementing its stability in highly turbulent external environment.
The results of this paper are the concept of creation of competitive advantages by the fertilizer companies and an analytical model for comparison of competitive advantages of fertilizer companies regarding its sustainability.

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Bibliography


Comparative analysis of competitive advantages...


COMPARATIVE ANALYSIS OF COMPETITIVE ADVANTAGES OF RUSSIAN FERTILIZER COMPANIES

Abstract

The Russian fertilizer industry is strategically important and potentially competitive in world markets, while also having good conditions for stable growth in Russia. Intense competition and changes in the structure of world trade forced fertilizer companies to gain and sustain competitive advantages. Therefore, the purpose of the article is to reveal competitive advantages of Russian fertilizer companies and compare them by evaluating their sustainability in order to find out most and less sustainable competitive advantages. In this paper, an analytical model for comparison of competitive advantages of fertilizer companies regarding its sustainability is proposed. This model was used for comparative analysis of competitive advantages of Russian fertilizer companies. Main sources of competitive advantages of Russian fertilizer companies, their components and results of their implementation are presented as one of the results of the research. Sustainable and non-sustainable competitive advantages were revealed. Russian fertilizer companies as well as foreign companies can use the results of the research for revealing more and less sustainable competitive advantages in order to strengthen its positions on the world market.

Keywords: fertilizer companies, competitive advantages, sustainability, fertilizer industry, mineral recourses.
ANALIZA PORÓWNAWCZA PRZEWAGI KONKURENCYJNEJ ROSYJSKICH FIRM PRODUKUJĄCYCH NAWOZY

Streszczenie


Słowa kluczowe: Spółki produkujące nawozy, przewaga konkurencyjna, zrównoważony rozwój, branża nawozów, zasoby mineralne.