

Greenhouse Vegetable Market Development Based on the Supply Chain Strategy in the Republic of Uzbekistan

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Abstract. In the context of a need to expand the export potential of greenhouse vegetables of Uzbekistan, the goal of this research was to develop an approach to determining development strategies for greenhouse businesses in Uzbekistan on the international vegetable market. By means of correlation and regression analysis and a method of expert assessment, a system of indicators has been determined that quantitatively and qualitatively defines the competitiveness of Uzbek greenhouse businesses on the international vegetable market. A data array has been formed by standardized values of indicators for Uzbekistan in 2012–2018 aggregated annually (the time series was seven observations). The analytic hierarchy process by [1] and Fibonacci numbers have been used to develop models for comparative assessment of competitive advantages and to calculate an integrated index of countries' competitiveness on the global greenhouse vegetable market. Based on the indices of competitiveness and world vegetable prices, a matrix of countries' strategies on the international vegetable market has been formed. This matrix has testified that greenhouse businesses in Uzbekistan are positioned in a trade-off area with an overcharging strategy. The results obtained have allowed the authors to identify key threats to the sales of vegetables and to develop practical recommendations for expanding the export potential of greenhouse businesses in Uzbekistan on the international vegetable market.

Keywords: *greenhouse businesses, vegetable market, Uzbekistan, supply chain strategy, export, price strategy*

1. Introduction

About 60% of the population in Uzbekistan lives in rural areas, therefore, income generated from agricultural activities is a priority for developing the potential of people living in this territory [1]. Particularly in the Republic of Uzbekistan, special attention is paid to fruit and vegetable production and

processing. Administrative and legal regulation in the country is aimed at enhancing the competitiveness of horticultural products on international sales markets. Special attention is also paid to mainstreaming and development of greenhouse farming to grow fruits and vegetables. Taking into account limited land in Uzbekistan as well as expansion of other types of agricultural activities with high added value, what is primarily expected is active greenhouse vegetable production development, which would primarily help promote the food security and food self-sufficiency of the republic with staple food crops and a significant growth in exports of these crops that are in demand on foreign markets [2]. According to the information available, there are over 160 thousand farms currently operating in the republic. The total greenhouse area is nine thousand hectares [3]. Uzbekistan increased the exports of greenhouse horticultural products in 2018 by 36.1% to 1.23 million tons in physical terms and by 37.5% to 874.5 million dollars in monetary terms [4]. In the horticultural export, Kazakhstan (51.9% out of overall volume), Russia (15.2%), Kyrgyzstan (8.6%), Afghanistan (5.5%), China (4.1%), Vietnam (3.0%), Turkey (2.1%), Pakistan (1.8%) and Iran (1.0%) are its chief partners [4-15]. A lack of an effective vegetable marketing strategy and undiversified sales markets (a restricted list of importing countries and an established structure) are major challenges of greenhouse horticultural exports of Uzbekistan in the current context, which leads to a number of potential risks [2]. First, a deteriorating economic situation and a contracted demand for fruits and vegetables in major importers can cause serious problems in the entire industry [16-25]. Second, the monopsony power of importing countries can create a situation where importing buyers would have the

opportunity to set prices for Uzbek vegetable products [14]. In turn, the sales markets of developed countries (the EU, Japan, Korea, China), in the case of diversified supplies of quality products that meet their product standards, are of interest from the standpoint of greater purchasing power [26-32]. A lack of an effective vegetable marketing strategy and undiversified sales markets (a restricted list of importing countries and an established structure) are major challenges of greenhouse horticultural exports of Uzbekistan in the current context, which leads to a number of potential risks [2, 33]. First, a deteriorating economic situation and a contracted demand for fruits and vegetables in major importers can cause serious problems in the entire industry [16, 34, 35]. Second, the monopsony power of importing countries can create a situation where importing buyers would have the opportunity to set prices for Uzbek vegetable products [14]. In turn, the sales markets of developed countries (the EU, Japan, Korea, China), in the case of diversified supplies of quality products that meet their product standards, are of interest from the standpoint of greater purchasing power [32]. Uzbek greenhouse businesses should expand the horticultural marketing geography subject to implementation of effective price strategies, in particular, by increasing the supplies to the EU, East Asia and other regions, while simultaneously diversifying the commodity structure of greenhouse

vegetable production. Therefore, the purpose of this article was to develop an approach to determining a development strategy for greenhouse businesses of Uzbekistan on the international vegetable market in the current context. Within the framework of this study, factors determining the competitiveness of Uzbek greenhouse businesses on the international vegetable market were identified. Based on these factors, an integrated assessment of the greenhouse business competitiveness of Uzbekistan and of the leading exporting countries on the international vegetable market was made. A price strategy matrix has been developed in accordance with positioning areas and price levels on the international vegetable market.

2. Literature review

A company's international strategy, including greenhouse businesses, is a description of coordinated actions to achieve goals on international sales market [13], [27], [32], [35], [37]. The main goal is to gain a profit by improving its competitiveness on the market [5], [6], [23]. Companies can increase profits in two ways: to increase the consumer value of a product's so that the consumers are willing to pay more for it or to reduce production costs for creating the product value [23]. In order for the measure to be a success, it is necessary to define the product position on the market (Table 1) [15], [34].

Table 1. Description of product positioning areas based on consumer and exchange value

Area	Characteristics	Improvements
Leadership	The slightest deviation from the desired (optimal) level of the estimated parameters. A manufacturer has the best indicators of product quality profiles	Getting the maximum possible benefits from the current sales market positions and laying the groundwork for retaining and increasing the existing market share
Confidence	Deviation of product quality profile indicators has a medium value. A company with strong competitive positions in the sales market but with a need to control the weakest quality parameters	Strengthening the quality parameters of products, consumer satisfaction and competitiveness, while maintaining the current position on the market
Trade-off	Some product quality profiles have the greatest deviation from the quality parameters of the main competitors, which indicates the presence of weaknesses in the enterprise performance	Search for ways to gain competitive advantage and to increase customer satisfaction

The "Leadership" area is the most "desirable" area for an enterprise; it is characterized by the highest rates of quality profiles, consumer satisfaction and the manufacturer's product competitiveness [34]. The "Trade-Off" area has the worst performance indicators [34]. If a positioning area is clearly defined, it becomes relatively easy to determine the enterprise positioning into an effective and consistent marketing program on the sales market. According to product positioning areas on the international sales market, an enterprise should choose an adaptive price

strategy for development on the sales market, which would consist in making nonessential changes to improve its product quality and technological processes, and entry into new sales markets [30]. In this case, the strategy can be considered as a form of forced response to changes in the market environment [17]. Based on scientific literature studies [18], [30], a matrix of possible price strategies was compiled, taking into account product prices and areas on the market (Table 2).

Table 2. Matrix of possible price strategies on the market

Area/price level	Leadership	Confidence	Trade-off
High price	(1) Super Profit Strategy	(4) Premium Price Strategy	(7) Overcharging Strategy
Medium price	(2) Market Entry Strategy	(5) Benefit Strategy	(8) Neutral Price Strategy
Low price	(3) Deep Market Penetration Strategy	(6) Super value Strategy	(9) Adaptation Strategy

Price strategies of enterprises on the sales market are dynamic and constantly require analysis of pricing decisions and their adjustment depending on market conditions. Strategies 1 and 4 are to set prices at a level slightly higher than the level that corresponds to the economic value of a product [30]. These strategies have disadvantages, namely: products should really have advantages in terms of customer value, and high profitability of production and product sales motivates competitors to capture this market share [18]. Strategy 7 falls under the category of risky strategies, since a high price paired with an average consumer value can be a significant barrier to the development of demand for it. Strategies 3 and 6 are mostly peculiar to enterprises with niche products [17], [30]. By setting prices below the economic value of goods, a manufacturer will be able to attract additional buyers and enter new markets. The disadvantage of these strategies is a perception of cheap goods as low-quality. Strategies 2 and 5 can attract consumers, using advertising efforts to explain significant benefits of a product utility at a more reasonable price to the consumer [18]. Strategies 8 and 9 stand for fixing such prices that would correspond to the economic value of a product for most buyers [17]. The choice of such this strategy is determined by the fact that the company is not able to set a higher price for its product as it does not have high consumer properties or there are no buyers on the market who could pay a higher price for the product. Based on the synthesized material in this section, the next step of the study was to determine effective price strategies for greenhouse businesses of Uzbekistan on the market.

3. Materials and methods

To determine the factors that have a significant impact on the volume of greenhouse vegetable exports was a priority task. The degree of significance of the impact was assessed using correlation and regression analysis. The parameters of

a regression model (b_0, b_1, \dots, b_n) were estimated by the least squares method. The indicator of vegetable export volumes of the Republic of Uzbekistan,

expressed in millions of US dollars, was used as a dependent variable (Y). Indicators that directly affect export volumes were considered as independent variables (economic factors) [7], [8], [35]: the vegetable production output in the Republic of Uzbekistan (X1); the level of domestic prices for vegetables (X2); the level of world prices for vegetables (X3); yielding capacity (X4); yielding capacity per capita (X5); planting acreage (X6); the volume of domestic trade (X7); investment in the industry (X8); cost of production (X9); the level of supplying the domestic demand for products in (X10) calculated as the ratio of production volumes to consumption volumes; the level of external demand for products (X11). The data array was formed by standardized values of indicators Y and X1-X11 for Uzbekistan for 2010-2016 aggregated annually (the time series was seven observations). Standardization was made according to Equation 1 [28] in order to bring the data into a commensurate form, since they have different dimensions and units of measurement "Eq. (1)":

$$X_{st} = \frac{X_i - \bar{X}}{\sigma}, \quad (1)$$

where X_{st} is the standardized indicator value;

X_i is the actual indicator value;

\bar{X} is the average indicator value;

σ is a mean-square deviation of the indicator.

As a result of the correlation and regression analysis, a system of single-factor models [10] of independent indicators (X1-X11) influencing the greenhouses vegetable product exports of Uzbekistan (U) was built. Using single-factor models has allowed for adequacy of the sample, whereby the number of observations should be six times as much as the number of independent variables in the model (seven observations with one independent variable), which also helps to avoid multi collinearity [20]. The statistically significant figures are shown in Table 3.

Table 3. Indicators of statistical significance of the economic factors influencing the vegetable exports of the Republic of Uzbekistan

Independent model variable	Indicators of statistical significance of variables		Indicators of the statistical significance of models	
	t-test (tab. 2.45)	p - level	R 2	F- test (tab. 5.99)
X1	3.05	0.020	0.77	7.35
X3	5.34	0.000	0.91	16.34
X9	-4.18	0.001	0.88	10.11
X10	3.85	0.012	0.83	8.67
X11	4.06	0.008	0.84	9.08

Significant factors affecting the greenhouse vegetable exports of Uzbekistan are X1, X3, X9, X10, and X11, for which the calculated t-test values specified in Table 1 exceed the tabular [2.45], with the error level p-level below 5%. This confirms adequacy of the single-factor models built and statistical significance of the variables. Adequacy of the models is indicated by variance (R2) that exceeds 0.75, and F- test, its calculated values exceeding the tabular 5.99. The tabular values of the t-test and the F-test were determined based on the number of degrees of freedom (1; 6) and the significance level of 95% [20]. Thus, with the probability of 95%, it can be said that the volume of vegetable exports is most significantly affected by the production output (X1), the level of world prices for vegetables (X3), the cost of production (X9); the level of supplying the domestic demand for products (X10), and the level of external demand for products (X11). In addition to quantitative indicators (X1, X3, X9, X10, X11), experts noted quality indicators that have a significant impact on the volume of vegetable exports. These are climatic conditions (X12), geopolitical situation (X13) and trade liberalization level (X14) (influences a country's competitiveness through export quota, trade tariffs, recommended export prices, and legal restrictions on exports). The expert group consisted of 30 representatives of the Ministry of Agriculture of the Republic of Uzbekistan. The results were obtained in an open panel discussion that lasted until a consensus was reached among the participants for opinion consistency. The veracity of discussion results is proved by the experts' competence coefficient (Formula 2), its value for each expert being not lower than 0.93, which $\rightarrow 1$ [4] "Eq. (2)":

$$C_i = \frac{\sum_{l=1}^m e_{ij}}{m}, \quad (2)$$

where C_i is the competence coefficient of the i -th expert;

e_{ij} are expert estimates corresponding to value "0" if an expert considers another expert incompetent and

does not deem it expedient to include them in the expert group, and "1" if an expert expressed the need to include another expert in the group;

m is number of experts.

In view of the limited statistical data, an expert method, that is, the analytic hierarchy process by [25] (AHP), was used for a statistical assessment of the level of competitiveness of greenhouse vegetable market in the Republic of Uzbekistan. Implementation of the AHP provides for: the experts building matrices of pairwise comparison of criteria (indicators) and alternatives countries, in this study), determining an eigenvector of the matrices based on Equation 4 [26, 29]; calculation of global priority (index of competitiveness) by multiplying normalized eigenvectors of the matrices of criteria and alternatives. A normalized eigenvector W^N is calculated as the ratio of the eigenvalue of a criterion (alternative) to the sum at the respective hierarchy level "Eq. (3)".

$$EW = \lambda_{\max} W, \quad (3)$$

where $[E]$ is a square pairwise comparison matrix;

W is the eigenvector of the matrix;

λ_{\max} is the maximum eigenvalue of matrix $[E]$.

To ensure representativeness of the AHP results, a concordance coefficient was calculated in order to assess the consistency of expert opinions (Equation 4) [4]; a consistency index (Equation 5) and a conformity relation (Equation 7) to assess the consistency of the hierarchy analysis results [1] "Eq. (4)":

$$W = 12 \times \frac{s}{[m^2 \times (n^2 - n) - m \times t_e]} \quad (4)$$

where m is the number of experts;

n is the number of factors;

S is the sum of squares of rank differences (deviation from mean);

t_c is the sum of the same rank values.

The concordance coefficient can vary in the range of $1 > W > 0$. At $W = 0$, there is no consistency of expert opinions, while at $W = 1$, there is absolute consistency [4] "Eq. (5)".

$$I_c = (\lambda_{\max} - n) / (n - 1), \quad (5)$$

$$R_c = \frac{I_c}{M(I_c)}, \quad (6)$$

where λ_{\max} is the maximum eigenvalue of a matrix;

n is the matrix dimension;

$M(I_c)$ is the average value (mathematical expectation) of uniformity index of a randomly composed pairwise comparison matrix, based on experimental data. Since the Netherlands, the USA, and China are world's leading exporters of greenhouse vegetables [24], these countries were used for comparative characteristics of greenhouse business competitiveness on the international vegetable market in order to identify effective price strategies for greenhouse businesses on the vegetable market. Among significant indicators of the vegetables market competitiveness, such indicators as X1, X9, X10, X12, X13, and X14 are differentiated with respect to countries; X3 and X11 are global indicators that ensure the same competitive positions for all countries; therefore, these indicators were not taken into account in the AHP. In addition, all the indicators except X9 are stimulants, as evidenced by positive values of Student's t-test. Exceeding the values of these indicators in comparison with other countries gives a competitive advantage. Indicator X9, cost price, acts contrariwise: the higher the value of this indicator is, the lower the production and export potential is. In order to obtain an integral value of competitiveness that would have lower and upper limits and would allow one to distinguish levels, let us assume that the highest estimate means the lowest cost during the expert assessment. The comparative competitive advantages of the Republic of

Uzbekistan were assessed as follows: assessment of indicator significance; assessment of the competitive advantages of Uzbekistan for each criterion; calculation of an integrated index of competitiveness based on the importance of indicators and relative competitive advantages of the country; highlighting the integrated index levels. The expert opinion consistency in the integrated assessment of the countries' competitiveness is proven by the concordance coefficient (Equation 5) with its value exceeding 0.75 (amounts to 0.81); the consistency index (Equation 6) and the conformity relation (Equation 7) with their values for all the scoring matrices not exceeding 0.1. The average indicators of significance of the vegetable sales market competitiveness and the average estimates of the countries' priority ranking for these indicators were calculated as geometric mean values of the priority vectors for the expert group. Price strategies of vegetable sales market behavior were identified by constructing a two-dimensional matrix with OX axis as a positioning area and OY axis as the level of world prices for vegetables. The positioning area was defined by highlighting the levels of the integrated index of competitiveness using Fibonacci rules [25] "Eq. (7)":

$$\begin{cases} e_1 = e_{\min} + 0.38(e_{\max} - e_{\min}) \\ e_2 = e_{\min} + 0.62(e_{\max} - e_{\min}) \end{cases} \quad (7)$$

where e_{\min} is the minimum integrated index value = 0;

e_{\max} is the maximum integrated index value for countries with the highest level of competitiveness = 0.42;

$[e_{\min}; e_1]$ is a low level of competitiveness;

$[e_1; e_2]$ is a medium level of competitiveness;

$[e_2; e_{\max}]$ is a high level of competitiveness.

The index of competitiveness is measured in the range [0; 1]. However, since this is an integrated index of comparative advantage, the index of competitiveness of the Netherlands (0.42) was used as the upper value when determining the levels as the maximum level of the integrated index of competitiveness on the vegetable market. This is a country that has absolute advantages in the export of greenhouse vegetables and has the best development

prospects, which will allow it to remain a leader in the vegetable sales market in the near future.

4. Data

The quantitative indicators affecting the level of vegetable exports and determining the level of competitiveness in the external market were identified on the basis of annual values of the greenhouse vegetable export volume indicators of the Republic of Uzbekistan (Y), the vegetable production output in the Republic of Uzbekistan (X1); the level of domestic prices for vegetables in the Republic of Uzbekistan (X2); the level of world prices for vegetables (X3); yielding capacity in the Republic of Uzbekistan (X4); yielding capacity per capita in the Republic of Uzbekistan (X5); planting acreage in the Republic of Uzbekistan (X6); volumes of domestic trade in the Republic of Uzbekistan (X7); investments

in the industry in the Republic of Uzbekistan (X8); the cost of production in the Republic of Uzbekistan (X9); the level of supplying the domestic demand for products in Uzbekistan (X10); the level of external demand for products (X11) in 2012–2018, coming from an official source [11, 19, 21, 27, 31]. The total number of independent indicators is 11, of dependent–1, of observations–7. Despite the fact that the number of observations is smaller than the number of independent variables, the analysis is adequate, since single-factor regression models of Y dependence on each indicator X1-X11 were built separately. To build a matrix of price strategies of the countries on the greenhouse vegetable export market in addition to the index of competitiveness calculated in the article, an indicator of the level (index) of world vegetable prices was used (Table 4).

Table 4. Index of vegetable world prices

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Index	0.7	0.9	1.0	1.1	1.0	1.1	1.7	2.3	1.5	2.0	2.5	2.2	1.9
Year	2014	2015	2016	2017	2018	Mean value in 2001-2018		2019 (January)	2019 (February)	2019 (March)	2019 (April)	Mean value in 2019	
Index	1.8	1.5	1.6	1.7	1.4	1.6		1.3	1.3	1.3	1.3	1.3	

Source: FAO Food Price Index, 2019

The price level was identified as “Inflation” in the matrix of price strategies on the vegetable market for greenhouse businesses.

5. Results

As a result of the expert assessment, the factors were ranked as follows with respect to their impact on the level of competitiveness (in decreasing order of

influence): production cost (priority value 0.25), the level of supplying the domestic demand for products (0.24), production output (0.22), trade liberalization level (0.14), geopolitical situation (0.09), and climatic conditions (0.06). The results of assessing the studied countries’ competitiveness have been summarized for all the experts and are presented in Table 5.

Table 5. Indices of the countries’ competitiveness in the context of competitive advantage criteria on the international vegetable market

Country	Index					
	X1	X9	X10	X12	X13	X14
The Netherlands	0.02	0.54	0.62	0.22	0.33	0.62
China	0.86	0.14	0.08	0.24	0.26	0.01
The USA	0.1	0.27	0.09	0.27	0.32	0.01
Uzbekistan	0.02	0.05	0.21	0.27	0.09	0.36

In terms of vegetable production, Uzbekistan is significantly below the industry leaders: its volumes are 50 times as low as in China, three times as low as in the US, and are approximately at the same level as

in the Netherlands. The highest competitiveness in terms of production cost is found in the Netherlands. Uzbekistan has the lowest competitive advantages upon this criterion. The production cost also includes

the costs associated with maintaining appropriate climatic conditions for cultivation, but this factor will be taken into account during the assessment upon criterion X12. In China and the United States, the largest negative vegetable trade balance is observed. This means that despite significant production and export volumes, domestic demand is unsatisfied by the domestic production [12]. A surplus is observed in the Netherlands, which indicates satisfaction of domestic demand. The Netherlands have the most adverse climatic conditions for vegetable production because it is a country with a small area located to the north compared with the other countries. The environment in the United States and Uzbekistan is more favorable but, according to the export statistics, climatic conditions are not decisive. By geopolitical situation, the United States, China, and the Netherlands hold top positions, since these are economically developed and politically influential countries conveniently located in geographical terms. Uzbekistan is a country with a developing economy.

In 2017-2018, Uzbekistan took major steps towards trade liberalization: business entities were allowed to export fresh fruits and vegetables on the basis of direct contracts 100% payable in advance; a requirement for surrender of 25% of foreign exchange earnings by exporting business entities was abolished, businesses had the right to export fruits and vegetables without a wholesale trade license [22]. But, according to Exposure draft for the procedure for monitoring the contract value of fruits, vegetables and textile products exported from the Republic of Uzbekistan [9], fruit and vegetable exporters can be held accountable for an economic crime if government officials decide that the export price has been understated, which reduces the competitiveness of exporters. In China and the United States, the trade liberalization is low because of the trade war between the countries. The integrated index value of external competitiveness calculated based on criteria order of priority and in terms of criteria order of priority is shown in Figure 1.

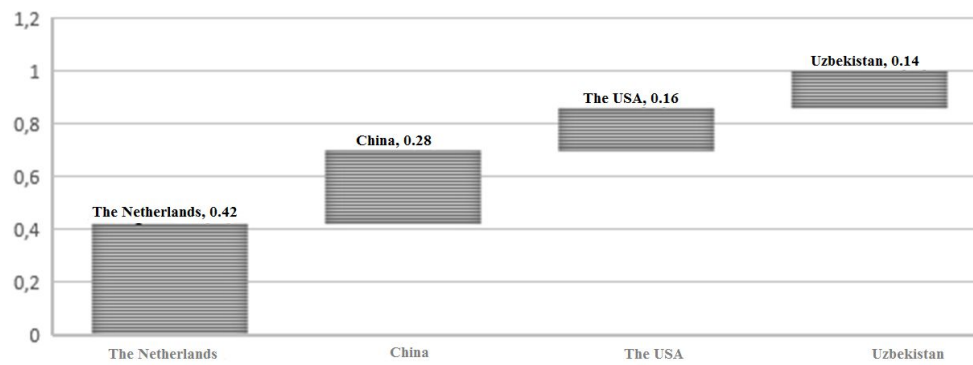


Figure 1. The countries' ranking positions the in terms of the integrated index of competitiveness on the international vegetable market as of 2018

Since the research has indicated that a low level of product exports and diversification within this study is the main problem of greenhouse vegetable sales in Uzbekistan, a matrix of market price strategies for selling vegetables based on competitive advantages has been developed. Producers are focused on making a profit, which depends on the price levels of the vegetables sold on the market. The price levels are determined by the market attractiveness. Consequently, depending on the price and competitive advantages, it is advised that greenhouse businesses develop a behavior strategy on this market. According to the integrated assessment of competitiveness on the international vegetable market, Uzbekistan is the last among the countries

under consideration with the index level 0.14. The Netherlands has the highest competitiveness level on the sales market—0.42. Based on the integrated index, quantitative and qualitative assessment criteria of the countries' competitiveness on the international vegetable market have been determined.

Table 6. Levels of competitiveness on the international vegetable market

Qualitative levels	Quantitative levels
Low	[0; 0.16)
Medium	[0.16; 0.26)
High	[0.26; 1]

The high level was extended to a potential maximum value of 1.0 adjusted for development. Price levels were determined based on the price index. A steady price level corresponds to the value of index 1 and its

confidence interval, taking into account an error of 5% [0.95; 1.05], deflation [0; 0.95), and inflation (1.05; + ∞). A matrix constructed in this way makes it possible to take into consideration the current

market position, the countries' export potential and profit opportunities, which is the major goal of greenhouse business activity in the vegetable market.

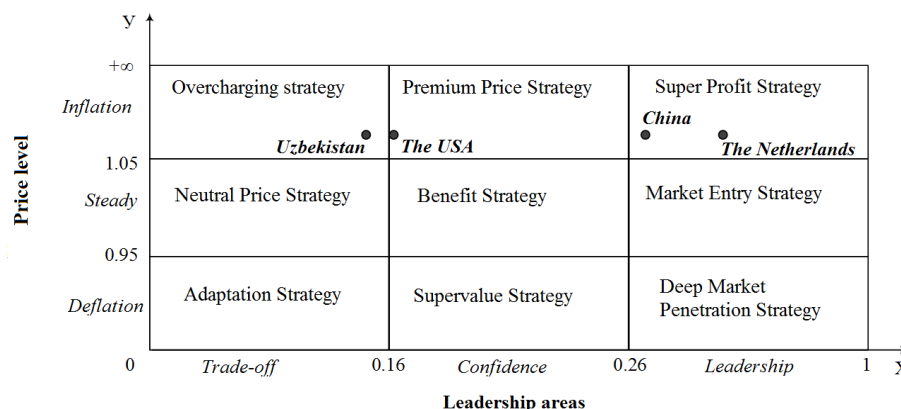


Figure 2. Matrix of price strategies of countries in the international vegetable market

The price strategy matrix allows for identification of market opportunities and threats to an exporter. Price levels indicate the potential amount of profit, while leadership areas indicate the ability to dictate terms on the market. The boxes “Super Profit Strategy”, “Market Penetration Strategy” and “Deep Market Penetration Strategy” show countries that are greenhouse vegetable market leaders and have the highest competitive advantages and development prospects: the Netherlands and China. Depending on price levels, an exporter either maximizes the profits when implementing the “super profit” strategy or secures a stable profit with the market penetration strategy, but it also may suffer losses over reduction in world prices in accordance with the “Deep Market Penetration Strategy”. Some reasonable behavior strategies of leaders at times of inflation are a production and sales ramp-up and expansion into geographically new markets. The USA has average competitive advantages and uses the premium price, benefit and supervalue strategies. Greenhouse businesses in Uzbekistan are characterized by a low level of competitiveness and are in the “trade-off” leadership area.

6. Discussion

The key factors determining the competitiveness of greenhouse businesses in Uzbekistan in the current context are: the vegetable production output in the Republic of Uzbekistan; the cost of production; the level of supplying the domestic demand for products; climatic conditions; the country's geopolitical situation, and the trade liberalization level. In contrast to the other research on the vegetable market

development in Uzbekistan that focuses on the current state of the greenhouse vegetable market behavior and the problems of legal and regulatory environment of the agricultural industry in the country [2], [7], this approach has allowed for a conclusion that the vegetable production and processing cost is one of the key destructive factors in the low level of competitiveness of Uzbek greenhouse businesses on the international vegetable market. The matrix of price strategies on the greenhouse vegetable export market has made it possible to identify that today greenhouse businesses in Uzbekistan are characterized by a low level of competitiveness and are positioned in the trade-off area. Works of scientists on marketing strategy development [15], [34] have made it possible to state that low profitability of vegetable exports, lack of steady export volumes, lack of well-established vegetable logistic supply structures, and lack of steady sales markets are key threats to Uzbek greenhouse businesses on the international vegetable market. In view of these findings, the following recommendations to improve marketing development strategies should serve as proposals for Uzbekistan's greenhouse vegetable trade development on the international greenhouse market. First, attention should be focused on diversified supplies of quality products that would meet the standards of the EU, Japan, Korea and China, as these countries are characterized by high purchasing power. In contrast to this, a slowdown in economic growth and deterioration in demand for fruits and vegetables is observed in the major importers of Uzbek vegetables.

The country should promote establishment and development of specialized organizations aimed at marketing of fresh, dried and processed Uzbek greenhouse horticultural products in countries with high purchasing power. Also, the price strategy matrix can attest to the fact that Uzbek greenhouse businesses should focus on finding a market niche on the international vegetable market. This will be facilitated by a diversified nomenclature of export horticultural products through a production ramp-up where Uzbek producers have competitive advantages, such as the ripening season (different from that of competitors), tastiness, etc., as well as new types of products, including new varieties with higher yielding capability and other characteristics, which would reduce the cost of production and allow for more successful competition in foreign markets. Emphasis should be placed on optimizing the cost of production, processing, storing and supplying vegetables to markets. First, it is necessary to ensure a targeted conversion of greenhouse facilities to the use of coal, which would cut the cost of vegetable production by 36%. It is advisable to optimize the logistical system of supplying Uzbek vegetables to the international market through development of national transportation companies with their own large fleet and organization of multimodal transportation services. The quantity of shipments by rail should be increased. Thus, the developed matrix of price strategies on the international sales market has allowed us to take into account the current market position, the export potential of the country and its profit opportunities, which is the major goal of greenhouse business activity in Uzbekistan. Yet, it should be emphasized that the way out of the trade-off strategy to a more effective marketing strategy also implies liberalization of the country's foreign economic policy [36]. Due to the fact that this aspect addresses such issues as exemption depending on the volume of exports, simplified export contracting, introduction of a mechanism for changing the assessment of customs value of vegetable products and their certification; in other words, they raise too many challenges remaining at the level of legal and statutory regulation of the greenhouse vegetable market, therefore, this study does not cover these aspects. But, in view of their importance for the most comprehensive study of this subject matter, these issues define our future scientific research priorities

based on the identified current marketing strategy of greenhouse businesses in Uzbekistan.

7. Conclusion

According to the research findings, it can be concluded that in the current context, to increase the export volumes of vegetables and to diversify them to countries with a high level of consumption is an integral factor in the development of greenhouses vegetable sales markets in Uzbekistan. A high level of production, storage and processing of products is a key destructive factor in the competitiveness of greenhouse businesses on the international vegetable market. This, in turn, causes a consistent trend of a significantly low level of competitiveness (the integrated index value is [0; 0.16]) of greenhouse businesses in Uzbekistan on the international vegetable market in relation to the major exporters: the USA, the Netherlands, and China. The developed matrix of strategies has testified that greenhouse businesses in Uzbekistan are positioned in the trade-off area on the international vegetable market, whereby the main threats are low profitability of vegetable exports, the lack of steady export volumes, the lack of well-established logistic structures for supplying vegetables, and the lack of steady sales markets. To switch to a more effective strategy in the premium pricing market, the export of diversified products to the EU, China, Korea and Japan should be developed subject to the organization of logistic systems for uninterrupted vegetable supply and cheaper production, as well as to liberalization of the external economic policy of Uzbekistan.

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