QUANTIFYING THE COMPARATIVE ADVANTAGE OF DOMESTIC GOODS ON THE INTERNAL MARKET

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Abstract. *This article focuses on the development of indicators to assess the comparative advantages of the product. Using synthetic indicator developed by the author, there was calculated the competitiveness of domestic goods on the internal market and the results are used for development of proposals to increase competitiveness. In addition, the article analyzes the dynamics of the digital economy development in the Republic of Moldova and correlation between competitiveness and digital economy. At the end of this article, the author has shown the impact of competitiveness and the digital economy on the sustainable development of the national economy.*

Keywords: *competitiveness; advantages; disadvantages; digital economy; sustainability.*
JEL Classification: *O10, O33, F14.*

1. Introduction

The people of any country want to increase their welfare, quality of life. The most people are mainly consumers. Commodities can be purchased not only in the classical way, in the market, in shopping centers, but also via the Internet. Day by day the digital economy is better introduced into our lives. Meanwhile the well-being of the people depends on incomes, on the growth rates of the economy and on its stability, which in turn depend on the competitiveness of manufactured goods on both domestic and foreign markets, as well as on the competitiveness of enterprises and the economy as a whole.

Taking into account all the above, the main purposes in this article are, firstly, to develop an indicator that would allow us to assess the competitiveness of domestic goods, and secondly, to investigate the relationship between the level of competitiveness and the development of the digital economy, as well as their impact on the stable economic development.

The assessment of competitiveness is a starting point for the production and economic activities of enterprises in a competitive environment, in conditions of market economy. At the same time, it is necessary to evaluate systematically not only the competitiveness of the products produced by the enterprise, but also the competitiveness of the enterprise and its personnel. The importance of assessing the competitiveness of economic goods is caused by the following circumstances:

- the degree of openness of the national economy;
- the high level of competition;
- the need to reduce the cost of goods and services;
- the need to develop measures to improve the competitiveness of products;
- the preparation of marketing programs for the promotion of goods both to domestic and foreign markets;
- the need to attract investor funds to organize competitive production.

2. Quantifying the comparative advantage of domestic goods

An evaluation of product competitiveness can be carried out using the competitiveness integral index or the comparative advantage index. In the case of an integral index, a pre-designed algorithm is used.

2.1. Algorithm for assessing the competitiveness of economic goods

Moseiko et al. (2015) have elaborated "the algorithm of providing the system's competitiveness, targeted at implementing 4 main qualities: functionality, system,

proactiveness and organicity". The author of this article suggested the following algorithm for assessing the competitiveness of products, which differs from algorithms developed by other scientists. Stages of the product life cycle are taken into account in the new algorithm. This algorithm makes it possible to find solutions to increase competitiveness, to evaluate the effectiveness of rationalization proposals which have been implemented, and to calculate the growth of comparative advantages (fig. no. 1).

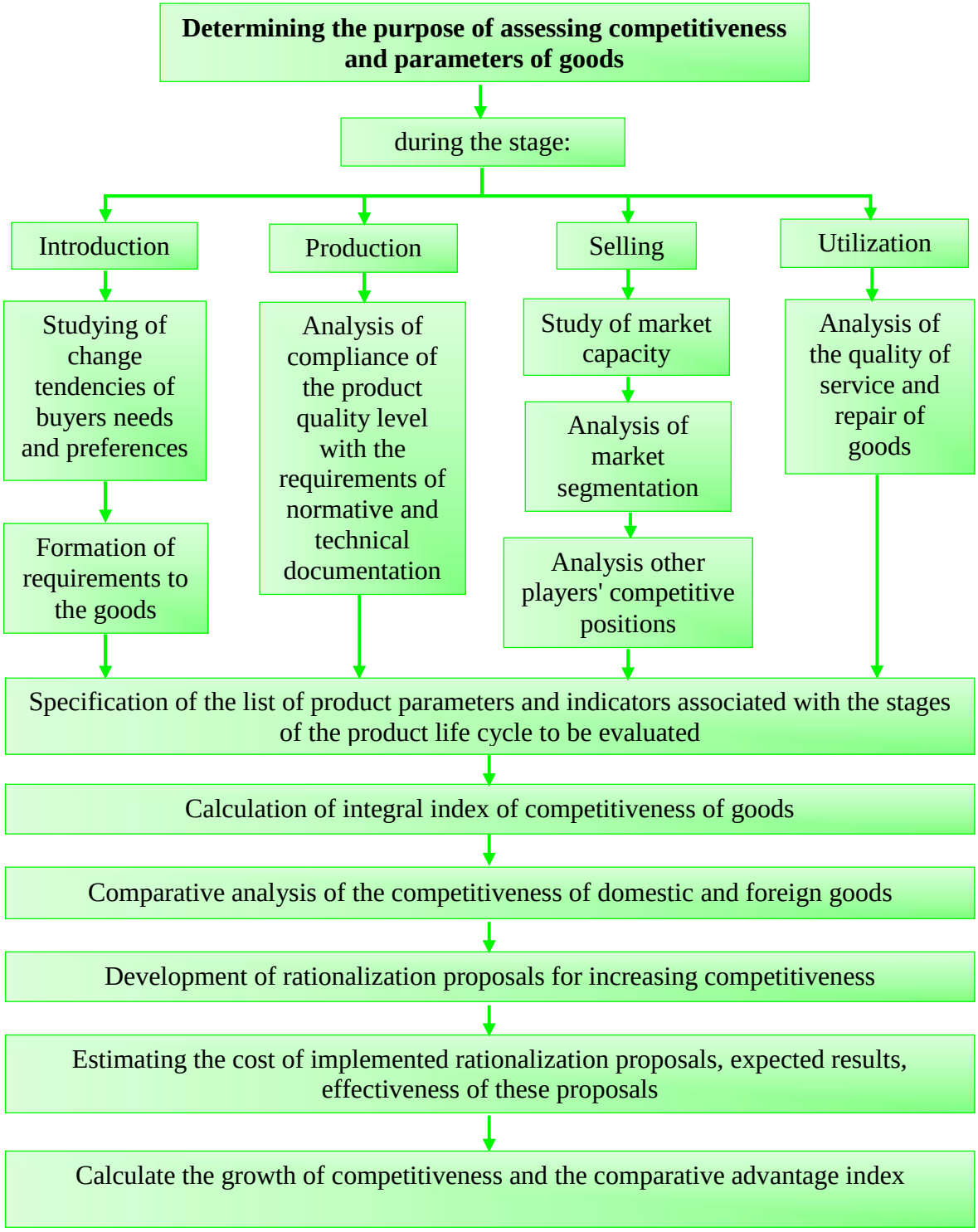

Figure no. 1. The algorithm for assessing the competitiveness of goods
Source: author's elaboration

The price is on the first place in the list of parameters of the domestic product subject to evaluation. Today in the Republic of Moldova, consumers prefer cheap and low-quality product and not one expensive and high quality. The causes of this trend in preferences are decrease of population's solvency, theft in banking system, currency devaluation, inflation, withholding wage, wage gap.

According to the National Bureau of Statistics of the Republic of Moldova in 2016 year the subsistence minimum in Moldova was 1799.2, and the average monthly household disposable income per person was 2060.2 lei (National Bureau of Statistics, 2016), during the reporting period. A disposable income was higher than subsistence minimum with 261 lei, or 13.1 US dollars. Solvency of the most part of population is very low; therefore, the price is the main parameter of evaluation.

Domestic enterprises, which tend to promote economic goods in foreign markets take into account national, regional standards and international standards like ISO, IEC and others. At the stage of assessing the parameters of the competitiveness of industrial products, the conformity of product parameters with mandatory regulations and standards that determine the level and boundaries of these parameters is established. If at least one of the parameters does not correspond to the mandatory level, which is prescribed by the current norms and standards, the goods cannot be considered as competitive, regardless of the result of the comparison by other parameters. First, should be carried out the study of compliance with the norms and standards in force in a particular country, and only in case of identifying a conformity, the assessment of the competitiveness of goods can be continued.

Organizational and commercial indicators reflecting real or potential conditions of sale of goods should also be taken into account in assessing the competitiveness of goods. The last is very important because, the presence of a large number of intermediaries leads to a considerable increase in the price. The increasing price of electricity, natural gas and other mineral resources leads to raise prices of all final goods, as a result a lot of goods become uncompetitive compared with analogical imported goods.

Managers take decision about enterprise's policy based on the result of the calculation of integral index of competitiveness of goods and analysis of organizational and commercial indicators. In the case when the parameters of the standard samples exceed the indicators of the evaluated commodity, managers should elaborate rationalization proposals for increasing competitiveness. In the case when the indicators of the evaluated commodity exceed the parameters of the standard samples, managers will decide to promote policy in accordance with the stated objectives in design, production and promotion goods on the domestic and external markets.

2.2. Comparative advantage index of domestic goods on the internal market

All revealed comparative advantage (RCA) figures cited in the literature assess the comparative advantages of goods in general on the domestic and foreign markets (Balassa, 1965; Dalum et al., 1998; Yu et al., 2009; Costinot et al., 2012), and not separately only on the domestic market. The author has developed the indicators for estimating the competitiveness of groups of domestic goods on the domestic market (Gutium, 2013; 2014). The author has improved previously developed indicators, which could use especially in case when goods are manufactured using raw of clients (Gutium, 2017).

The use of the above indicators in estimating the competitiveness of domestic goods has shown that the results obtained with some goods are erroneous. This situation can be explained by the presence in the economy of elements of the shadow economy, such as illegal imports, illegal exports and underground production. The indicator that was elaborated in 2013 uses data in a value terms, but we know that prices of exports and prices

of imports of the same goods are different, so the author has set an aim to develop another indicator. It would be calculated based on data in physical terms, and would take into account illegal exports, illegal imports or underground production, in case of their existence.

The author adapted the model of inter-branch balance in such a way as to assess the elements of the shadow economy at the level of microeconomics and obtain the necessary information in order to correctly estimate the competitiveness of domestic goods on the internal market. In the process of developing the adapted model, the methodology of elaborating the goods and services account and the Leontief's model were combined and used.

The goods and services account was adapted for the use at the level of microeconomics. In the process of adaptation, the following two features were taken into account:

- the output at purchaser prices includes output at basic prices and the value of taxes minus subsidies on products,
- the volume of finished goods sold on the domestic market includes goods purchased for final consumption and goods purchased by resident units for later use in the process of production.

The adjusted account represents the microeconomic balance between uses and resources of goods (Table no. 1).

Table no.1. The goods account

Uses	Resources
Intermediate consumption; Volume of finished goods traded on the domestic market: Goods purchased for final consumption; Goods purchased by resident units for later use in the process production; Changes in inventories of goods (Inventories of goods at the end of the year minus Inventories of goods at the beginning of the year); Exports.	Output at purchaser prices; Imports at purchaser prices.

Source: author's adaption

Based on the goods account, the model of natural inter-branch balance (Ganciucov, Gutium, 2015) was further adapted. The adapted input-output model (Table 2) allows estimating both elements of the shadow economy and the competitiveness of domestic goods on the internal market.

In the case of the most goods, total resources are equal to total uses. In such cases, it is necessary to use net symmetrical comparative advantage index of goods on the domestic market to calculate the competitiveness index (Gutium, 2017).

If total uses are higher than total resources, an underground production or illegal imports take place. In the case where total resources are higher than uses, illegal exports take place. For such cases, the author has developed the following indicators to calculate the competitiveness of domestic goods on the internal market in comparison with the foreign goods sold on the internal market and exported domestic goods:

$CAID_i^{SE}$ – Comparative advantage index of goods *i* on the domestic market, taking into account the shadow economy;

$SCAID_i^{SE}$ – Symmetrical comparative advantage index of goods *i* on the domestic market, taking into account the shadow economy.

Table no.2. The adapted input-output model

Goods	**Uses**							**Resources**				
	Intermediate consumption	Finished goods traded on the domestic market		Inventories of goods at the end of the year	Exports	Other outputs (loss of goods)	**Total uses**	Output (domestic product)	inclusive	Imports	Inventories of goods at the beginning of the year	**Total resources**
		Goods purchased for final consumption	Goods purchased for later use in the process production						Domestic product manufactured with the customer's material			
A	1	2	3	4	5	6	7	8	9	10	11	12

Source: author's adaption

$$CAID_i^{SE} = \frac{\left[\left(Q_i + Q_i^{UP}\right) - Q_i^{RC} - \left(X_i + X_i^I\right) - CI_i - L_i\right] \div \left[\left(Q_i + Q_i^{UP}\right) + \left(M_i + M_i^I\right)\right]}{\sum_{i=1}^{n}\left[\left(Q_i + Q_i^{UP}\right) - Q_i^{RC} - \left(X_i + X_i^I\right) - CI_i - L_i\right] \div \sum_{i=1}^{n}\left[\left(Q_i + Q_i^{UP}\right) + \left(M_i + M_i^I\right)\right]} \quad (1)$$

$$SCAID_i^{SE} = \frac{CAD_i^{SE} - 1}{CAD_i^{SE} + 1} \times 100\% \quad (2)$$

where Q_i – Domestic product *i*;

Q_i^{UP} – Underground production goods *i*;

Q_i^{RC} – Domestic product *i* manufactured using raw of clients;

X_i – Export of goods *i*, taking into account the illegal exports;

X_i^I – Illegal exports of goods *i*;

CI_i – Changes in inventories of domestic goods *i*;

L_i – Other outputs (loss of goods *i*);

M_i – Import of goods *i*;

M_i^I – Illegal imports of goods *i*.

For example, in the case of the "walnuts", the adapted input-output model elaborated for 2016 showed that the uses were higher than resources with 11.3085 thousand tons. According to the data of the Customs Control Department in 2016, twelve thousand eight hundred and sixty nine tons of "walnuts" were exported, but only four thousand seven hundred and forty two tons were produced this year. Consequently, an underground production of "walnuts" has occurred.

If we would use official data to calculate the symmetrical comparative advantage index, without taking into account the elements of the shadow economy, we would have obtained the following result SCA = 232.23%, which is erroneous, since this indicator can have a range from -100 to +100. Recalculation of this indicator, taking into account the underground production, gave a different result, namely -18.28%.

Taking into account that the Republic of Moldova is an agricultural country, the author estimated competitiveness of goods from agro-industrial complex. Results of calculation are presented in Table 3. The most competitive domestic food products on the

internal market are bread and milk, followed by eggs and grapes. The demand for these two goods is high, as the welfare level of the population is still low and these two goods are the main food goods. In 2016, average monthly disposable income per person reached 103.4 US dollars, and monthly average consumer spending totalled 106.2 US dollars. The biggest share in the expenditure structure is the food consumption - 42.6%. If real income level is decreasing then the share of superior goods decreases and the share of inferior goods increases.

Table no.3. Symmetrical comparative advantage index of some goods of agro-industrial complex of the Republic of Moldova on the domestic market, taking into account the shadow economy, 2016 year

Goods	$SCAID_i^{SE}$, %
Fresh bread	48.98
Milk	48.74
Birds' eggs, in shell, fresh, preserved or cooked	45.86
Grapes, fresh or dried	45.61
Bread, pastry, cakes, biscuits and other bakers' wares	43.00
Sugar confectionery (including white chocolate), not containing cocoa	38.49
Beer made from malt	36.35
Meat, edible meat offal nes, fresh, chilled or frozen	35.25
Waters, including mineral waters and aerated waters	34.22
Sparkling wine of fresh grapes	32.51
Butter and other fats and oils derived from milk; dairy spreads	32.30
Pasta, whether or not cooked or stuffed	16.43
Wheat or meslin flour	16.20
Prepared or preserved meat, meat offal and blood, nes	-22.93
Fish, fresh or chilled, frozen,	-25.77
Groats	-75.74
Prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs	-81.97
Margarine	-82.45

Source: author's calculation

Although domestic milk is competitive on the internal market, margarine is not competitive; 13.53 thousand tons of margarine was imported in 2016. The domestic market is loaded with imported margarine, but resident producers can produce this kind of goods. The symmetrical comparative advantage index of meat is 35,25% and the level of this index for preserved meat is negative, i.e. this product has a comparative disadvantage, despite the fact that Moldova has the raw material necessary for the production of preserved meat. *In conclusion, in the case of some food products, Moldova needs to regain its own market.*

3. Correlation between competitiveness and the digital economy and their impact on the sustainable development of the national economy

The competitiveness of the national economy is assessed using the Global Competitiveness Index. In order to research the correlation between competitiveness and the digital economy, we should analyze the evolution of this index and of indicators of the sub-pillar "Use of Information and Communication Technologies". This sub-pillar includes four indicators (Table 4).

The Global Competitiveness Index (GCI) recorded a cyclical evolution during the period 2013-2017. There was a direct correlation between the GCI and the share of Internet users. The impact of this indicator on the GCI is significant. Fixed-broadband Internet subscriptions and mobile-broadband subscriptions were increasing during analyze period. The evolution of these two indicators does not significantly affect the competitiveness of the national economy.

Table no.4. Evolution of the Global Competitiveness Index and of indicators of the sub-pillar "Use of Information and Communication Technologies" of the Republic of Moldova

	2013-2014 (out of 148)		2014-2015 (out of 144)		2015-2016 (out of 140)		2016-2017 (out of 138)		2017-2018 (out of 137)	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Global Competitiveness Index (GCI)										
GCI	89	3.94	82	4.03	84	4.00	100	3.86	89	3.99
Sub-pillar "Use of Information and Communication Technologies"										
Internet users, % pop.	77	43.4	70	48.8	74	46.6	79	49.8	49	71.0
Fixed-broadband Internet subscriptions, /100 pop.	52	11.9	52	13.4	52	14.7	56	15.5	54	16.3
Internet bandwidth, kb/s/user	23	94.0	23	115.8	18	152.4	16	194.9	34	144.1
Mobile-broadband subscriptions, /100 pop.	97	5.1	42	47.2	59	49.4	70	51.9	75	55.5

Source: The Global Competitiveness Report 2017-2018, World Economic Forum

In conclusion, namely the qualitative indicator (share of Internet users) of the sub-pillar "Use of Information and Communication Technologies" has a direct impact on the Global Competitiveness Index.

The huge potential of the digital economy is still not fully exploited in the Republic of Moldova by economic agents, and by the public administration. The digital economy creates new business opportunities, diminishing the shadow economy. Now that the unemployment rate among young people is high, the digital economy allows young specialists to reduce the amount of time they need to become employed in labour market.

4. Conclusions

The digital economy contributes to the sustainable growth of the national economy, creation of new jobs, diminishing of corruption and reducing of unnoticed economy.

Moldavian enterprises do not take full advantage of the opportunities offered by the digital economy. They could increase their turnover by actively using the internet to get in touch with raw material suppliers and buyers.

A competitive economy is based on the high-skill employees, high-efficiency technologies, a high degree of diversification of entrepreneurial activity, and is taking place when entrepreneurs, consumers, government employees, bank wage-earners, functionaries of ministries and departments have digital competences.

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