

Actual problems for logistics management and strategies of supply chain in Georgia

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Abstract. In social-economic development strategy, logistics is considered as one of the priority direction to increase the competitiveness of the country. In order to adapt the flexibility of the supply chain, the companies should properly work and carry out such logistics strategy, which allows them to identify the influence of the expected changes and make organizational or functional amendments to ensure the reduction in logistics costs. The development of logistics system contributes the integration of Georgia in global economy space and strengthens its competitive positions on international logistics market. In the work, it's been studied the potential of increasing the functional load of Georgian ports and the potential of establishing them as logistics centers, it's been reviewed logistics role, as a vital sector in terms of global trade and as a continuous and uninterrupted delivery of goods during a crisis period of Covid-19 pandemic. Strategies for supply chain has been studied and evaluated by sectoral mark according to expertise, economic-statistical and analytical methods and it's been defined the role of Georgia in global logistics network and the actuality of involvement in it.

1 Introduction

The ongoing processes of globalization around the world and aspiration of integration with European Union creates the opportunities for active involvement of Georgia in international trade. In the mentioned process, transport and logistics sector must perform a crucial role of the country to become a part of global supply chain. This has a positive effect on the development of entrepreneurial and export activities, on increasing the accessibility of the market, education, employment and additional investment [1].

The future key elements of production and sales system and distribution network will be innovations, digital technologies, transport and logistics and for commercial organizations, online platforms, blockchain decisions and others. It's essential the digitization of information exchange and interaction for continuity of maritime transport operations under the pandemic conditions. It ensured the continuity of transport operations and trade procedures. The rapid introduction of technological decisions ensures the continuity of entrepreneurial activities and state procedures.

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The significant improvement of transport and logistics sector in Georgia has been conditioned by the economic and infrastructural reforms, carried out in the recent years in the direction of simplification of customs procedure and liberalization of services in key sector of economy.

As a result of it, the transit and logistics potential has been increased, what should have to create the conditions with global markets to improve the international connections. But it should be noted that, Georgia still faces the challenges in connection with the transformation as regional and logistics hub, which includes low quality of service, outdated logistics infrastructure and equipment, ineffective management of supply chain, lack of qualified staff and others [1].

While working on the work, the attention has been paid on the problems of supply chain strategy and logistics management in Georgia. Expert-specialists, employed in the field of logistics, evaluated the types of service via vehicles considering the relevant criteria and sectoral mark. The most ponderable (weighted) criteria was evaluated and revealed between the pre-selected criteria by using the expert method. According to economic-statistical, comparison, analysis and synthesis methods of the study it was identified the actual problems for management of Georgian logistics companies and it was determined the ways, which should promote the involvement of the research field in the global logistics network.

2 Results

The globalization of the economy increases its attitude to the supply mechanisms, transportation and logistics. The beginning of Covid-19 pandemic has confirmed the critical importance of transport and logistics systems not only on state level but international level too. According to the data of “Allied Market Research”, logistics global market increases with 3,5 % per year, its value in 2019 year was 4,53 billion dollars, it should have to achieve 12,3 billion dollars by 2020 year and according to the prognosis, the mentioned value will reach to 16,82 billion dollars by 2027 year. Herewith, the average annual growth rate will be 17,9 % by 2020-2027 years [2].

Particular attention should be paid to the optimization of the supply chain management, by which the following problems are solved: reducing the whole cycle of planning; expanding its area due to the reliable and timely delivered information; the optimization of product types, expenses and suppliers, selection of the required contractors, support the relationships with them; minimization of production costs between the contractors via information exchange and products flows. Timely connections between the participants of the supply chain gives an opportunity to be revealed in advance so called “narrow places” directly in the production process, to reduce the warehousing costs according to the demand based on the optimization of production volume. This task responds to the concept of Just-in-Time delivery. To improve the quality of logistics service via flexible and timely delivery process. According to the data of the largest analytical companies (AMR Research, Forrester Research), the following advantages are reviewed by using SCM: profit growth from 5-to-15 %; reduction of order processing time and cost from 20-to-40%; reduction of warehouse stocks from 20-to-40 %; reduction of the time of placing on the market from 15-to-30%; reduction of purchase costs from 5-to-15%; reduction of production costs from 5-to-15%. Despite this, Operations and finance leaders have good reason to be fearful about the continued challenges supply chains will face in 2021 [3].

Instability of logistics system in Georgia causes high logistics costs, what is accompanied by lack of coordination in terms of order processing, stock management, warehousing and distributing. The logistics performance index (LPI) of the world bank indicates to the need of development-perfection of logistics system in Georgia, where according to the data of last 2018 year, Georgia had 119th place between 160 countries. The

rating of 5-point scale is done in accordance with six main indicators: efficiency of customs procedures and border management; quality of transport infrastructure: ability to produce competitive international transportation; ability and quality of logistics services; possibility of cargo tracking; timely delivery to the place of destination according to the cargo schedule [3]. Deterioration was observed in traceability and tracking rates. The mentioned is connected to the lack of integration of information and communication technologies and electronic data exchange systems and low level of logistics processes.

Industry 4.0 plays an important role in logistics and supply chains management. The transition to digital manufacturing and online shopping forces us to take a fresh look at logistics, as a management instrument of value chain and determine the focus of expected changes in logistics. The analysis of the results of Covid-19 crisis should stimulate international dialogue, the goal of which will be the simplification of conducting the transactions between the borders [4]. As the practice, introduced in successful logistics systems, shows us one of the perspective direction for Digital SCM/Logistics is using the blockchain technology. Blockchain is multifunctional and multi-level information technology, the purpose of which is the reliable accounting of various assets and transactions. Potentially, this technology includes all fields of economic activity: finances and economy, transactions in tangible and intangible assets, state operations and accounting in the companies, management of supply chain and logistics and others. [14].

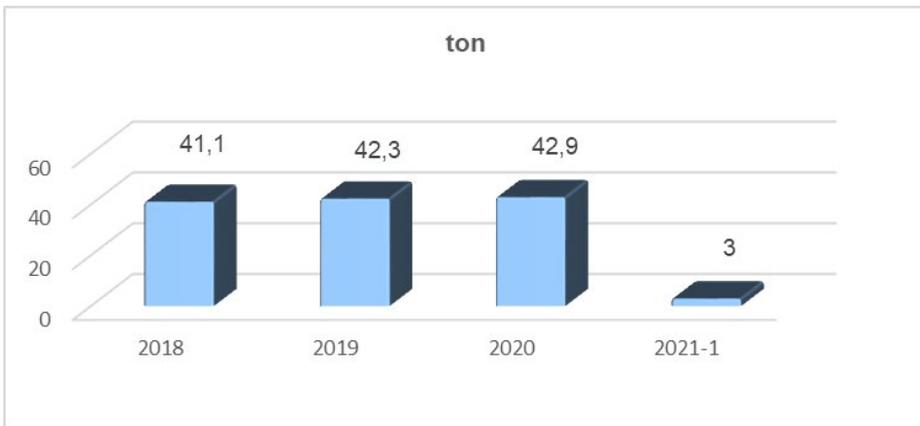
The use of this technology will profoundly change the operations of the company in the supply chain, because the clients will have the direct information about goods and services of company-contractors. Investors will be able to finance the companies without financial markets as well; business-models will be able to be changed and improved radically; the cost structure will become transparent and the execution of the contracts will become unhindered [1]. Blockchain gives us a new decentralized paradigm in integration and collaboration of supply chain, including in finances, information, products and technologies. Blockchain is able to increase the efficiency in automatically processing data and reducing the number of intermediaries, in automatic management [33].

Accordingly, Blockchain-technology integrated the supply chain and helps the business in cost reduction and improvement of collaboration via exchanging the information. It has enormous potential to stimulate the digitization of the field supply chain and to establish the common standards of collaboration. IBM and Maersk worked out the supply Blockchain called TradeLens, which is a platform, where there's shown the sample of international supply chain. During the process, all users share the relevant current status, so each of them confirms the latest information [22].

Recently, the share of maritime shipment has been increased in the world cargo turnover. As table 1 shows us, dynamics of shipping by maritime transport is increasing. In 1994 year compares with 1989 year, more than 13 % shipping was made, in 2004 year compared with 1999 year – more than 18 % and in 2019 year compared with 2014 year – more than 12 % cargo shipping was made. If we compare 1979-2019 years – cargo turnover of maritime transport was increased with 189%, what is caused on the one hand by the growth of global turnover and on the other hand, with the advantage of using the maritime transport (Table 1). The main transport systems of Georgia are airports of international and local importance, seaports /terminals and rail transport. According to the data of ministry of economy and sustainable development, total amount of the cargo transported by the transport sectors in Georgia in 2020 year consisted – 42,9 million tons, this indicator has been increased with 0,6 million tons (42,3 million tons) compared with 2019 year and with 1,8 million tons (41,1 million tons) – compared with 2018 year. to total number of cargo, transported in transport sectors is characterized with the growth trends under the conditions of Covid-19 compared with the previous years, what is stipulated with uninterrupted functioning of transport sector (Fig. 1).

Table 1. dynamics of the loaded products on maritime transport according to the cargo type (million tons) [12].

Year	Total goods	Crude oil	Other tanker trade	Dry cargo
1974	3304	1497	335	1472
1979	3828	1725	318	1785
1984	3364	1079	399	1886
1989	3940	1260	468	2212
1994	4485	1498	509	2478
1999	5683	1553	532	3598
2004	6758	1770	546	4442
2009	7818	1710	931	5177
2014	9816	1712	1122	6983
2019	11076	1860	1308	7907

**Fig 1.** The (total) number of cargo, transported by transport sectors in Georgia.

There are four seaports open for international navigation in Georgia. All of them are owned or managed by private companies. All types of cargo (dry, container, liquid) are processed in Poti and Batumi ports. LPG, crude oil and petroleum can be processed in Kulevi oil terminal and crude oil and petroleum is processed in the port of Supsa.

Table 2. The cargo, processed in seaports of Georgia in 2019 year and statistics of throughput mastering [18].

Cargo and capacity (million tons)	Batumi		Poti		Kulevi		Supsa	
	processed cargo	mastering %						
Dry cargo handling	0,7	35%	3,4	85%	-	-	-	-
Ferry crossings	0,8	100%	0,3	29%	-	-	-	-
Oil reloading	0,9	6%	0,6	56%	1,6	26%	3,7	46,3%
Containers, TEU	116,08	58%	531,7	97%	-	-	-	-

As table 2 shows us, the potential of maritime transport of Georgia is high. But its mastering indicators are not satisfactory. Due to the fact that a large part of the cargo flow in Georgian ports is transit, the reduction of economic activity in neighboring countries has a negative effect on dry and liquid cargo, also the redirection of cargo to other ports /corridors, operational restrictions due to configuration, problems related to depths (silting up) (Poti, Kulevi), what limits to use large tonnage vessels. Due to the above, seaport operators have to control the depth of the entrance canals and make deepening works, what is related to the significant costs [20]. The combination of high tariffs, trade imbalances and waiting for a long time at wharfs is a hindering factor for attracting the additional cargo flows to ports.

It should be noted that the role of maritime transport as a key sector has been increased around the whole world under pandemic conditions, which has a great importance in terms of continuous and uninterrupted delivery of vital goods and global trade during the crisis periods. Pandemic has become a kind of test stone not only for globalization, but also for global solidarity and cooperation. It's necessary the agreed actions for data standardization, for monitoring of ports activity and for developing the defense mechanisms against cyber security [23]. The annual throughput of Georgian railway is 28 million tons. During 2013-2018 years, the number of the freight, transported by railway was decreased from 18.2 million tons to 10.0 million tons, but by 2019 year, it was increased with 9 % and throughput was provided with 39 %. It should be noted growing trend of container transportation of the rail, which is maintained despite of epidemic situation by 2020 year.

Strategic geopolitical location of Georgia stipulates the interest of neighboring countries as well as the interest of Europe and East Asian countries to use Georgia as a transit region. Trans-Caspian International Transport Route - "Middle Corridor" provides the freight transportation from China to Europe and backwards via Kazakhstan, Azerbaijan and Georgia. Southwest corridor has a great potential for Georgia, because it connects the countries of the Persian Gulf and India with the European Union countries through Georgia. The first railway container transportation of goods from China via "Middle Corridor" was carried out in 2015 year. It should be noted that, by passing the "Middle Corridor", there has been a sharp increase in the number of container transportations from China to the direction of Georgia and Europe, in particular, in 2019 year it was 2,774 TEU, what is more than 107.3% compared with 2018 year. Herewith, it should also be noted the fact that, transportation was also carried out in the direction of Gzech Republic, namely, the first container block train was passed from China, C. Syan and successfully arrived in C. Prague passing through Georgia and Turkey, in particular Baku-Tbilisi-Kars railway. There should be noted that despite world challenges and delays, existing in transport and trade sector, caused by spreading Covid -19 pandemic, the growing trend has been observed this year too. in particular, in 2020 year, in the period of January-July, 1,785 TEU was transported with the abovementioned route, what is more than 81,6 % (983 TEU) compared with the same year of 2019 year. [20].

According to statistical data of Civil Aviation Agency, the volume of the freight, transported by airline companies, acting in Georgia [10] totally consisted of 34,065 tons in 2016 year, what is increased with 18,799 tons (totally 15,266 tons) compared with 2010 year. Turnover was reduced with 2,341 and 8,554 tons according to the years or it consisted 31,42 tons in 2017 year and 25,511 tons – in 2018 year. The volume of the freight, transported via airways was 24 911.336 tons in 2019 year, what is less than 543.49 tons, accordingly less than 2.14 % than the number of the cargo, transported in the same period of 2018 year [10]. The number of the freight, transported via air ways was 19 266,220 tons in 2020 year, accordingly turnover was reduced with 22 % [11] (Fig.2). The reason for this is on the one hand the pandemic-related restrictions and on the other hand the high prices of cargo transportation vi air transport.



Fig. 2. Volume (tons) of the cargo, transported via air transport in Georgia

International freight transport has been characterized with stable dynamics. In 2019 year, 10,7 million tons freight was transported, what is higher with 16,8 % than the previous year indicator is and it totally consists of 25,2 % of freight transportations.

Table 3. The number of freight, transported via freight vehicles (thousand tons).

Mode	2014	2015	2016	2017	2018	2019	2019/6	2020/6
Export of Georgia	692.0	910.6	968.9	1430.8	1253.7	1513.0	723.9	619.5
Growth compared with the previous year	-	31.6%	6.4%	47.7%	-12.4%	20.7%	-	-14.4%
Import of Georgia	2975.8	2952.1	3299.0	3705.0	3894.7	4376.6	1871.7	1972.9
Growth compared with the previous year	-	-0.8%	11.8%	12.3%	5.1%	12.4%	-	5.4%
Transit of Georgia	2638.3	2708.4	2886.1	3628.5	3992.5	4783.2	2209.5	2509.2
Growth compared with the previous year	-	2.7%	6.6%	25.7%	10.0%	19.8%	-	13.6%
Total	6306.1	6571.1	7154.0	8764.3	9141.0	10672.7	4805.1	5101.6
Growth compared with the previous year	-	4.2%	8.9%	22.5%	4.3%	16.8%	-	6.2%

Thus, Georgia is a link between Europe and Asia and it has a chance to become transport and logistics hub and in order to achieve this, the following goals are set: the development of reliable, effective and quick logistics services, human capital, transport and logistics sectors, secure connections and corridor. This is stipulated with the market requirements and with the need to develop private sector services, with no alternativeness of their support.

For the purpose of searching the information about the problems, existing in logistics and supply chain, we conducted expert research, where participated the entities, employed in this sector. The conducted expert research gives an opportunity to evaluate the problem quickly, the basis of which is high qualification of experience of the professionals. We considered it appropriate to evaluate 10 experts, who were interviewed through the direct way within the marketing research.

Most of the experts prefer road transportation from the supply channels, sea, air and mixed shipments are less required. The selected supply channel is reliable and safe for six experts, but in most cases he has no other alternative. It should be noted that outscoring is used by only one carrier out of many. Most of them don't use it or they have an exclusive partner.

Depending on the type of procurement, most companies use online platforms, some of them addresses to the networks of logistics companies, or the system of contractual agreements and personal contacts. According to the most carriers' opinion, the competition is great but in most cases, they've no competitors and they are only ones on the market.

The following was revealed from the problem of supply chain: reduced freight turnover, imposition of new regulations at customs points, insolvent clients, quoted permit, delayed consent for transport permit on oversized and special cargoes, queues at customs checkpoints, prolongation of freight sending and delivery period, reduction of passengers flow (what reduced the income with 90%), duration of time and damage of the cargo. The latest Covid-19 regulations around the world, the change of the exchange rate reduced the freight turnover and the number of insolvent customers was increased. Accordingly the orders were reduced with 10 % and freight turnover – with 20 %, also there was reduced the realization process and passengers movement. Types of services via vehicles was evaluated with five-point system by the competent specialists/experts, employed in logistics sector according to the criteria, shown in the table 4.

Table 4. The evaluation of criteria of service types via vehicles and the relevant weighting coefficients.

	Criteria (a _i)	experts (j)										Sum	Medium	weighting coefficients
		1	2	3	4	5	6	7	8	9	10			
1	reliability	5	5	5	5	5	4	4	5	5	5	48	4,8	0,1599
2	terms of delivery	3	5	4	4	3	4	4	5	4	4	40	4	0,1336
3	frequency of cargo transportation	5	5	4	4	4	4	3	3	5	5	42	4,2	0,1398
4	transportation cost	5	3	3	3	5	3	5	3	4	4	38	3,8	0,1273
5	ability of freight transportation and delivery	5	5	5	5	3	3	3	3	5	5	42	4,2	0,1388
6	accessibility	5	5	5	5	5	2	5	5	5	5	47	4,7	0,1551
7	safety	0	5	5	5	5	4	5	5	5	5	44	4,4	0,1455
sum		28	3	3	3	3	2	2	2	3	33			1,000
			3	1	1	0	4	9	9	3				

Based on the obtained results, for the purpose of calculating the criterion weight (24), the ponderable (weight) criteria was revealed.

$$a_i = \frac{\sum(p_{ij} \cdot p_{cj})}{m} \tag{1}$$

In which a_i – is a moment of the parameter, i – is a number of the parameter; j – is a number of the expert; m – quantity of experts in the board; P_{ij} – the ball grade of the i parameter by j expert; P_{cj} - total of the ball grades of the parameters by the j experts.

As the obtained results show, the reliability weight criterion consisted of a₁=0,1599; The weight index of the delivery time for the next criterion is equal to 0,1336 (a₂=0,1336); the index weight of criterion of frequency of the third cargo transportation is equal to 0,1398 (a₃=0,1398); Accordingly the weight of the cost of the fourth transportation is 0,1273 (a₄=0,1273); Accordingly the possibility of freight transportation and delivery, the

weighting coefficient is 0,1388 ($a_5=0,1388$); the weight of the access is 0,1551 ($a_6=0,1551$) and safe criteria weight is equal to 0,1455 ($a_7=0,1455$). According to the obtained results, it's clear that the most weighted criteria is reliability, accessibility and safety, what is particularly important and actual under the conditions of Covid-19.

3 Conclusions

Conducted studies and experts' evaluation gave us an opportunity to form the advisory opinion regarding the development of logistics and transport sector:

- the reduction of infrastructural deficiencies, which hinders the international trade turnover;
- facilitate of intensive introduction of international practice of logistics and supply chain;
- rapid mastering and digitalizing of the technologies, herewith technologies increasingly reach in supply chains and its distribution networks, including in logistics. Making technological decisions and knowledge of the latest achievements will become an essential condition and not the option. Pandemic showed us that pioneers are able to withstand the fluctuations faster in technologies mastery. For example, e-commerce and online platforms, decisions made on the basis of blockchain.
- risk assessment and their management. The risks assessment should be integrated with global interconnections and interaction.
- staff training and retraining. Logistics is high-technological sector, which is suffered with a deep shortage of the experienced staff not only in Georgia but around the world as well.
- attract the investments and introduce multimodal transport infrastructure.
- agreed work between different kinds of transports, increase the productivity of the operations based on the growth of the qualification and efficiency of human capital.
- development of all components of transport network in time and in parallel from sender to receiver in order not to degrade the results of system operation and reducing the efficiency of system operation, what make the sector uncompetitive.

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