



LOGISTICS CLUSTERS AND THEIR POTENTIAL FOR ECONOMIC DEVELOPMENT

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Abstract

Supply chain resilience in the face of shocks has arisen as a policy issue due to the multilateral trading system lowering trade barriers. Innovations in transportation technology created intelligent transport systems and production fragmentation of global supply chains. However, climate shocks and the COVID-19 pandemic restructured supplies in the global markets. At the same time, geopolitical conflict and tensions emerged with Russia's invasion of Ukraine, increased China's military activity, introduced additional tension, and created difficulties for the supply chains. On the other hand, the current industrial policy, aiming at national economic growth, is motivated by objectives different from increasing company-level productivity or spillovers between sectors. The concern primarily revolves around supply chain resilience, the fear of weaponizing exports, supporting technological advancement, and the need for policymakers to introduce greater control over economic activity in anticipation of potential shocks. In cross-border supply chains, some governments seek to coordinate their industrial policies with the most significant partners without implementing measures at the national level (Bown, 2023). Overlaying other considerations is the existential threat of climate change, a significant driver behind many modern industrial policy initiatives. That is leading to the rebirth of the idea of logistic clusters uniting different partners in size with foreign trade-oriented activities, aiming at efficiency as well as resiliency of the logistics chains. Based mainly on deep secondary research, this paper addresses the rebirth of cluster ideas in international transport and logistic activities.

Keywords: *logistics, clusters, efficiency, supply chain, activities*

1 TRANSPORT AND LOGISTICS ACTIVITIES IN BULGARIA AS A SUPPORTING INDUSTRY

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With transport contributing around 5% to the EU GDP and employing more than 10 million people in Europe, the transport system is critical to European businesses and global supply chains (EC, 2020). The primary challenge lies in reducing the reliance of the transportation system on petrol, all while maintaining efficiency and mobility levels without compromising. In line with the "Resource

Efficiency Europe" initiative set out in the Europe 2020 strategy and the Energy Efficiency Plan, transport must use cleaner energy, sustainably exploit modern infrastructure, and reduce the harmful impact on the environment (water, soils, and ecosystems), as limiting mobility is not a solution. In addition, increased demand for freight transport is expected to lead to growth of more than 40% by 2040 (EP, 2016), though the general opinion is that this forecast is overrated.

Logistics efficiency is therefore vital to both international trade development and growth. A country's trading power depends on agents' access to transport and logistics networks. Better overall logistics performance is strongly associated with trade expansion, import and export diversification, investment attractiveness, and economic growth.

Furthermore, the efficiency of a country's supply chain (in terms of cost, time, reliability, and flexibility) depends on the specific features of its logistics performance, in the co-location of companies sharing assets, competencies, logistics infrastructure, tracking systems, knowledge and information (Chung, 2016). In the opinion of several scientists, the development of the transport and logistics infrastructure is the basis for supporting many industrial activities, and the increase in the number of companies leads to an increased demand for logistics services, through two complementary factors in terms of the value-added process, namely:

1. availability of logistics terminals and industrial zones (national and local competitiveness and ability to attract foreign investments);
2. possibility of concentration of industrial companies that use logistics services.

The state of the transport infrastructure, the availability of ITS, as well as the potential for the development of combined transport in Bulgaria, are shown in the Integrated Transport Strategy in the period 2030 (2017). Due to its intermediate geographic situation in the active transport corridors, along which freight and passenger traffic is attracted to pass through the territory of the country, intermodal terminals have been approved for inclusion in the map of the trans-

European transport network (TEN-T), which can provide several opportunities for increased competitiveness and economic growth of Bulgaria (EP, TEN-T Revision – AUSTRIA, 2022). Transport infrastructure is also of crucial importance for the development of industrial zones planned in the North-Western region (in the cities of Pleven, Cherven Bryag, Dolna Mitropolia, Levski and Nikopol), North Central region (Design and construction of industrial, technological and transport-logistic and fair parks), South Central region (Completed industrial-logistics zone, Svilengrad), South-Eastern region (Project "Building the technical infrastructure of the Industrial and logistics park - Burgas and High-tech park Bulgarovo"), etc. During the period 2014-2020, funding for transport infrastructure tripled, with a primary focus on the main transport network where the EU experiences the most significant added value. To prioritize East-West connections, almost half of the total EU funding for transport infrastructure (€11.3 billion from the Connecting Europe Facility) will go to countries supported under the Cohesion Policy, which also includes Bulgaria.

The investment strategy of the Operation Program "Transport and Transport Infrastructure" (2014-2020) (n.d., 2018)), in the part of intermodal transport and terminals, aimed at developing the network of terminals meeting the requirements for modern freight transport services to ensure better coordination between individual types of transport in the direction of the development of intermodal services, establishing of reliable and fast rail connections between terminals. Operational Program "Transport Connectivity" (OPTC) 2021-2027 (Luica, 2022) will concentrate its investments mainly on the completion of priority railway and road directions and on promoting multimodal transport by improving connections between individual modes of transport. The Integrated Strategy identifies seven terminals, two of which on the design stage (Ruse¹ and Varna), two non-working (Yana and Dragoman), two in operation (Burgas - Dolno Ezerovo and Stara Zagora), and one prepared for concession (city of Plovdiv). State Enterprise National Company Railway Infrastructure (NCRI) owns three

¹ An interesting fact was the initial inclusion of the intermodal terminal in Ruse in the Recovery and Sustainability Plan (RSP), but consequently, it was

dropped due to the impossibility of being completed by 2026 (RuseInfo, 2023)

terminals. NCRI and State Enterprise Port Infrastructure jointly own one. Private logistics companies operate the remaining terminals.

2 LITERATURE REVIEW OF THE NATURE OF LOGISTICS CLUSTERS

The interdisciplinary field of logistics intersects with transportation, technology, public policy, global trade, and other macro issues. Logistics is becoming a major part of the process of achieving competitive advantages in today's global economy. Logistics clusters, which enhance complexes of logistics activities, are concentrated in certain locations, usually associated with the transport infrastructure points (e.g., ports, free duty-free zones) worldwide. The clustering process of this kind unlocks positive influences over economic growth while stimulating related economic diversification in logistics-intensive areas.

The role of the supply chain for our country and the rest of the world related to logistics is not only about increasing value and benefits along the chain but also about reducing the overall logistics costs, energy consumption, and harmful emissions over the environment. Those strengths bring new opportunities, such as driving new capital investments and jobs. Logistics clusters and their capabilities play a significant role in enhancing the competitive positions of both the national and global economies.

The "logistics cluster" is a geographically concentrated complex of logistics-related business activities. Yossi Shefi outlines the characteristic "positive feedback loop" of the development of logistics clusters and what distinguishes them from other industrial clusters; how logistics clusters "add value" by generating other industrial activities; why firms should locate their distribution and value-added activities in logistics clusters; as well as the proper role of government support in the form of investment, regulatory and trade policy (Sheffi, 2012). Logistics clusters, in which sets of logistics activities co-locate and concentrate in specific locations, have emerged worldwide. Such clustering unlocks large positive externalities and economic growth in logistics while stimulating

related economic diversification in logistically intensive fields (Smith, 2014).

Horizontal cooperation affects the interaction between a manufacturing firm and a logistics operator, dealing with inefficiencies (Horvath, 2001). It is carried out by synchronizing the amount of cargo to be transported with the distribution networks ("insyncing"). In terms of warehouses, there is an optimization of the combination of stocks (partnership in the use of warehouse areas), in the case of transport – joint expeditions and joint use of transport capacity. In addition to warehousing and transportation, horizontal cooperation can be expressed through joint efforts to create a critical mass of customers, which increases the frequency of deliveries (especially effective with common delivery points for partner companies). Another effect is the increased intensity of supplies and the ability to negotiate lower vehicle prices.

Logistics-intensive industrial clusters are agglomerations of several types of firms and operations:

1. companies providing logistics services such as 3PL², transportation, warehousing, and forwarding services.
2. logistics operations of industrial firms, such as distribution activities for retailers and manufacturers (in many cases post-sales services).
3. operations of companies with logistics as an integral part of their business.

Similar logistics clusters also include companies performing truck maintenance activities, software providers, specialized law firms, international financial service providers, etc.

The added value of the logistics cluster is achieved because of the intensity of the transport services offered, the sharing of storage areas and equipment, the use of the advantages of free economic zones, for example, the avoidance of certain charges, which on the one hand creates similarities with the classic industrial clusters, and on the other hand, contributes to higher economic efficiency and competitive advantages. Therefore, measuring and analyzing the activity of the logistics cluster is relevant to local, national, and regional competitiveness.

² Third-party logistics

time, including the number of firms joining, the number of firms leaving, and the number of firms at the end of a given time. In this case, the leading factor is "public trust".

- **Subsystem "Innovations"**, including new technologies, ICT, and promotion of electronic services (exchange of documents, other information, requests by electronic means, etc.).
- **Subsystem "Human resources"**. Modern logistics is knowledge-intensive, requiring university and other specialized training of human potential, as well as labor-intensive. Personnel recruitment and resource sharing are essential for synergy reasons, part of the synergy being the benefit from institutional support in measures to reduce pressure on the environment.
- **Subsystem "Investments"** (in terms of attracting, adoption, infrastructure development, etc.)

The developed sectoral activities of the cluster are transport (railway, maritime, and HVT), warehousing, and other auxiliary activities, within the emerging field of "Logistics service". The cluster strategy and action plan cover the following 5 joint areas:

- General marketing plan, with a tendency to support the growth of exports.
- Product development, by providing diversified service, based on capacity sharing, achieving a sustainable competitive advantage.
- Communications at the national level and within the sector - shared vision, trust, and common values.
- Development of ICT, through innovation and implementation of key technologies.
- Development of professional and higher education, with a view to the emergence of new professions and requirements for increased competencies

Support services are provided by the cluster in the field of internationalization, for market access in non-EU countries (in particular China, and Kazakhstan), to facilitate cooperation with partners from member states (in particular Finland, Sweden, and Latvia), promotion of

transparency and cooperation with other clusters (Estonian ICT cluster).

Among the negative effects of clustering in the case of logistics clusters is the increase in the intensity of competition, because of the presence of oversupply (Rivera, Gligor, & Sheffi, 2016). In general, however, logistics clusters have been studied less than industrial clusters.

3 BENCHMARKING AND ESTABLISHED PRACTICES IN LOGISTICS CLUSTERING

European best practices in the field of logistics clusters are represented by cluster entities in countries with long-term EU membership, for example, the Netherlands (Logistics Cluster in the Port of Rotterdam), but also by similar structures in newly acceded countries, for example, the Estonian Logistics Cluster (ELC, 2010). It is a joint initiative, with a mission dedicated to the international marketing of members' services, introducing Estonia's logistics advantages to target markets, R&D, and logistics education. The Estonian Logistics Cluster was launched in June 2010, initiated by the Ministry of Economy and Communications of Estonia³. The total number of members is 16, fourteen of which are SMEs (over 70%), and 2 university centers. The most prominent of them are Port of Tallinn, Estonian Railways, EVR Cargo, Alexela Logistics, Baltic Rail, Tallinn Technological University, Maynor Business School, Estonian Logistics and Transit Association (LTA), etc.

In Bulgaria, an intention to create an Intermodal transport and logistics cluster - Ruse was announced in 2014, including cooperation in the field of transport and logistics in the Ruse region, with participants Holding Bulgarian State Railways, wholly owned by the Bulgarian state, representatives of the academic community of the University of Ruse "Angel Kanchev", Executive Agency "Research and Maintenance of the Danube River", Shipping Company "Bulgarian River Navigation" JSC, Holleman Bulgaria, Ltd, Donau Transit Ltd, and other companies and organizations. A Cooperation Agreement has been signed, aiming to enhance interaction and improve the efficiency of activities within the

³ The cluster is a result of an implemented project, with 70% of the funds coming from the ERDF and 30% from

the members of the cluster (total value 185700 euros, for the period 15.01.2014 - 28.02.2015)

participating organizations and companies in the emerging cluster. However, no such cluster has been registered to date.

The Green Transport Cluster (GTC) (2011) is a non-profit association uniting the efforts of companies in the transport industry for the development of intermodal transport in Bulgaria and its accompanying activities. The main priority of the cluster is the integration of national intermodal transport and terminals in international intermodal networks, as well as the promotion of green transport corridors in Bulgaria. It is comprised of twenty-three members (GTC, 2023).

Among the projects in which GTC takes an active part are dedicated to the integration of the ferry complexes (Varna Railway and RoRo Burgas) and the Bulgarian Black Sea container terminals with the existing internal terminal in Sofia into a single logistics chain, as well as the expansion of cargo flows from third countries for the feeder and ferry operators. Some of the biggest Bulgarian transport and forwarding companies participate in the cluster, such as the Bulgarian Shipping Company Navibulgar, and Bulgarian River

Shipping JSC, which hold the intermodal terminals in the ports of Burgas and Vidin, Discordia, a leading road carrier in Bulgaria, DB Schenker Rail Bulgaria, Bulgarian Railway Company, Bulmarket DM Ltd., etc.

4 CONCLUSION

Logistics efficiency is vital to both international trade development and growth. A country's trading power depends on agents' access to transport and logistics networks. Better overall logistics performance is strongly associated with trade expansion, import and export diversification, investment attractiveness, and economic growth.

The above analysis highlights the potential of logistics clusters in stimulating economic activity and expanding opportunities for international trade.

Bearing in mind the importance of cluster development policy within the EU we recommend supplementary organization, financial, and operational efforts to develop clustering in the field of international logistics.

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