

Global Competitiveness Index and Logistics Performance Index: A Conceptual Assessment

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Abstract

This study examines the conceptual relationship between the Logistics Performance Index (LPI) and the Global Competitiveness Index (GCI). The LPI, created by the World Bank, examines countries' logistics performance across six main dimensions, while the GCI, developed by the World Economic Forum, assesses countries' competitiveness levels under twelve key elements. With the acceleration of globalization, the decisive role of logistics performance on countries' foreign trade capacities, integration into global supply chains, and economic growth potential has increasingly grown. The literature reveals that GCI components such as infrastructure quality, institutional structure, technological readiness, human capital, and governance have a direct impact on logistics performance. In this context, the study emphasizes that the relationship between logistics performance and global competitiveness is reciprocal and complementary; it draws attention to the fact that countries need to address logistics performance, including its institutional and political dimensions, in order to achieve sustainable competitive advantage.

1. Introduction

One of the most comprehensive studies presenting a comparative view of the global logistics sector across countries is the Logistics Performance Index (LPI), developed by the World Bank. This index, consisting of six dimensions, is based on survey data from professionals providing international transportation and express cargo services. Economic performance is among the key indicators reflecting a country's level of development, and logistics

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capacity and efficiency play a decisive role in shaping these indicators. The increasing volume of foreign trade and structural problems in global trade have made logistics a strategic area; this has necessitated countries developing logistics-based strategies to support their sustainable domestic and foreign trade systems (Kalansuriya et al., 2024). Today, countries and the firms that comprise their economies need systematic approaches to remain competitive in the long term (Uğurlu Yaşar et al., 2025: 38). With the acceleration of globalization, the concept of competitiveness has gained central importance in evaluating the economic performance of countries. In this context, the Global Competitiveness Report, which aims to comparatively present the competitiveness levels of countries, has been published by the World Economic Forum since 1979, and countries are evaluated through the Global Competitiveness Index (GCI). Addressing national competitiveness within a macroeconomic framework, the GCI analyzes the institutional, economic, and structural elements that determine the productivity levels of countries under 12 key dimensions, providing a comprehensive assessment of countries' global competitiveness (Qazi, 2024).

National competitiveness is considered as a composite of institutional structures, policies, and economic factors that shape a country's productivity levels, and this level is directly reflected in welfare and income levels. The Global Competitiveness Index (GCI), developed by the World Economic Forum, evaluates competitiveness within a framework of 12 key pillars, a significant portion of which have a decisive impact on logistics performance. Infrastructure quality, institutional environment, technological readiness, human capital, and operational capabilities are among the main elements directly affecting the efficiency of logistics activities. In this context, in order to reduce the differences in logistics performance between countries, it is necessary to adopt long-term and prioritized policy approaches that focus on the GCI components that most significantly affect logistics competitiveness (Sala-i Martin et al., 2015).

In this context, it is understood that the interaction between logistics performance and global competitiveness is among the main factors shaping countries' levels of economic development and sustainable growth potential. Components evaluated within the scope of GCI, such as infrastructure quality, institutional framework, and technological readiness, play a decisive role in reducing differences in logistics performance between countries. Therefore, it is important for countries to implement priority and long-term policy strategies that support logistics performance in order to strengthen their global competitiveness.

2. Conceptual Framework

2.1. Competitiveness and Global Competitive Index (GCI)

Global competition is a fundamental element of modern economic systems and is among the primary factors determining the economic performance and success levels of both businesses and countries today. The global competitive environment refers to a structure in which businesses and countries operating worldwide compete with each other in order to maintain and expand their existing market shares (Güler & Veysikarani, 2024). With the process of globalization, the concept of competition has gained increasing importance; economies, while pursuing their growth and development goals, have also turned to developing strategies to increase their competitiveness. In this context, competition is considered as a process of interaction and rivalry that takes shape over time between firms, sectors, or countries in order to achieve economic goals and interests. However, the concept of international or global competition is not unified under a single and common definition in the literature. Therefore, rather than the conceptual definition of competition, the question of how it can be measured comes to the forefront. In the literature, it is stated that evaluations made through competitiveness indicators provide more reliable and meaningful results than direct measurement of competition (Gündüz & Parlak, 2022: 120). The globalization process brings with it various obligations that all actors must meet, due to factors such as constantly changing consumer expectations, the formation of new markets, the spread of disruptive business models, increasing competition, and rapidly advancing technological developments (Uğurlu Yaşar et al., 2024: 554).

With the acceleration of the globalization process, studies on measuring international competitiveness have increased, and various theoretical models have been developed to explain the determinants of competitiveness. In this context, Porter (1990) explains international competitiveness with the Diamond Model, while Cho and Moon (2002) address competitiveness within the framework of the Nine-Factor Model. In these models, the competitiveness levels of countries are evaluated through elements such as factor conditions, firm strategies, the presence of related and supporting industries, and demand conditions. Furthermore, government policies and chance are included in the models as complementary elements affecting international competitiveness.

When international economic theories and business approaches are examined, it is seen that numerous components and variables are effective

in determining competitiveness. The assumptions put forward in this framework are supported by theoretical foundations in different studies and, rather than being mutually exclusive, emphasize different dimensions of the competition phenomenon. The World Economic Forum, as part of its Global Competitiveness Report, calculates the Global Competitiveness Index by combining numerous components representing various aspects of competitiveness using a weighted average method (Global Competitiveness Report, 2006–2019).

The Global Competitiveness Index (GCI) 4.0, created by the World Economic Forum, examines the competitiveness levels of countries according to 12 key dimensions. These dimensions are institutions, infrastructure, adoption of information and communication technologies, macroeconomic stability, health, skills, product market, labor market, financial system, market size, business dynamism, and innovation capacity. Within the index, countries' overall competitiveness performance and scores for each sub-component are reported using an "progress score" ranging from 0 to 100. On this scale, a value of 100 represents the "frontier" point where factors limiting productivity growth are eliminated and ideal conditions are represented. The GCI 4.0 framework was implemented with the publication of the Global Competitiveness Report (WEF, 2025) in 2018.

The Global Competitiveness Index (GCI) provides a comprehensive framework for assessing national competitiveness levels by considering both microeconomic and macroeconomic dimensions. The index is built upon three fundamental principles for measuring competitiveness. First, it acknowledges that the factors determining competitiveness are multidimensional and complex, and accordingly, competitiveness is measured under 12 main components. Second, economic development is considered not static, but a dynamic process of successful development, consisting of three stages: factor-based, productivity-based, and innovation-based. Third, it is assumed that economies increase their competitiveness over time by progressing to a more advanced stage of development (WEF, 2013).

The Global Competitiveness Index (GCI) assesses the competitiveness of countries from short-term and long-term perspectives, encompassing institutional and political dimensions. The index is calculated based on three main factors, a combination of 12 complementary indicators. The determinants of global competitiveness are addressed under the first factor, "Basic Requirements," which includes indicators related to institutions, infrastructure, the macroeconomic environment, and health and basic education. The second factor, "Productivity-Enhancing Factors," is calculated

by combining indicators such as higher education and vocational training, the efficiency of the goods market, the efficiency of the labor market, the level of development of the financial market, technological readiness, and market size. Finally, “Innovation and Diversity Factors,” encompassing data on the level of development of the business environment and its innovation capacity, constitute the index’s third main factor (WEF, 2012).

Table 1. Global Competitive Index (GCI)

Basic Requirements	Efficiency Enhancers	Innovation and Sophistication Factors
1. Institutions 2. Infrastructure 3. Macroeconomic Environment 4. Health and Primary Education	1. Higher Education and Training 2. Goods Market Efficiency 3. Labour Market Efficiency 4. Financial Market Development 5. Technological Readiness 6. Market Size	1. Business Sophistication 2. Innovation

WEF (2013), Global Competitiveness Report 2013-2014:9

The scope of the 12 key components used in calculating the index, presented in Table 1, and their importance on competitiveness are summarized below.

Infrastructure refers to the legal and administrative framework regulating the interaction between institutions, individuals, firms, and public authorities, playing a decisive role in achieving income and welfare growth. It increases the efficiency of economic activities through the quality of physical infrastructure; it facilitates trade and enhances competitiveness by reducing interregional distance costs. The macroeconomic environment is considered a fundamental element in establishing sustainable economic growth and increasing the country’s competitiveness. Health and basic education are factors that directly affect workforce productivity; a healthy workforce with a high level of basic education supports national productivity and, consequently, competitiveness. Higher education and vocational training encompass indicators such as secondary and higher education enrollment rates, increasing the workforce’s capacity to adapt to changing economic conditions and production structures. The efficiency of the goods market reflects the quality of the competitive environment and demand conditions; healthy market functioning is important for ensuring effective competition in domestic and foreign markets and establishing a supply-demand balance.

The efficiency of the labor market includes elements such as wage flexibility and the effective use of labor, increasing economic flexibility by directing workers to the areas where they are most productive. The sophistication of the financial market enables financial resources to be directed to the most efficient areas of use rather than political concerns, thus contributing to the maximization of return on investment. Technological readiness refers to the extent to which the necessary technological infrastructure and digital environment have been created to increase the productivity of the industry. Market size allows firms to benefit from economies of scale, creating positive effects on productivity. Business dynamism (the sophistication of the labor market) enables higher efficiency in production processes through the organizational capacity and management quality of businesses, and supports competitiveness. Innovation, going beyond the gains provided by elements such as strengthening corporate structures, developing infrastructure, ensuring macroeconomic stability, and improving human capital, stands out as a fundamental determinant of sustainable competitiveness in the long term. Innovation strengthens countries' global competitiveness by contributing to the emergence of new industries and job opportunities, increasing employment, and raising living standards (WEF, 2013; U.S. Department of Commerce, 2012).

2.2. Logistics Performance Index (LPI)

With the impact of globalization, countries that can minimize costs have gained a more advantageous position in international trade. One of the fundamental conditions for success in international trade is ensuring efficiency and effectiveness in the logistics sector. Today, the decreasing importance of cost-increasing factors such as access to raw materials in international markets has led companies to utilize logistics services more intensively. In this process, companies gain a cost advantage by conducting their logistics activities through outsourcing. Governments, on the other hand, create a favorable environment for multinational businesses through policies that strengthen logistics infrastructure. The main reason for this is that the logistics sector is one of the areas where public authorities can intervene directly and effectively (Ulutaş & Karaköy, 2019).

Trade and logistics policies are central to determining a country's commercial competitiveness. International trade, a major factor influencing a country's development level, is closely linked to the strength of its logistics infrastructure. An economy with inadequate logistics infrastructure is unlikely to achieve a strong position in international trade and consequently, exhibit robust economic performance. Conversely, countries with

predictable, efficient, and effectively managed transportation networks and trade procedures benefit more from technological advancements, economic liberalization, and access to global markets (Manavgat & Demirci, 2021: 1860).

Logistics is a complex structure encompassing numerous interrelated activities such as transportation, warehousing, consolidation, distribution, and payment systems. Evaluating these activities through measurable indicators allows countries to analyze their logistics performance levels. In this context, the Logistics Performance Index (LPI) is considered an effective tool for measuring logistics performance and constitutes an important reference point in policy development processes for logistics management. The LPI enables countries to assess their own logistics capacities, make comparisons with other countries, and make visible the costs of poor logistics performance (Yu & Hsiao, 2016, p. 98).

The LPI, the first comprehensive study comparing the logistics performance of countries on a global scale, was developed by the World Bank. The main objective of the index is to reveal the level of competition between countries and to contribute to improving their logistics performance through this competition. LPI provides a valuable information source for policymakers and implementers by offering comparable data on countries' basic logistics processes, timing, and cost performance (Acar & Çetinceli, 2020, p. 891).

Various performance indicators have been developed to evaluate core logistics activities. International logistics encompasses numerous elements such as transportation processes, payment systems, cargo consolidation, warehousing activities, and the spatial distribution of customs checkpoints within a country (Arvis et al., 2007). Therefore, measuring a country's logistics performance through a single indicator is difficult. To more accurately assess logistics performance, multiple criteria must be considered together. In this context, the World Bank, with contributions from business professionals and academic experts, developed the Logistics Performance Index (LPI) to reveal the level of competition between countries and to guide logistics reforms. The LPI aims to comparatively evaluate the effectiveness of countries' logistics systems and provide an indicator of international competitiveness (Yapraklı & Ünalın, 2017: 594).

Table 2. Six Components of the Logistics Performance Index

LPI Components
Customs
Infrastructure
International Shipments
Logistics Service Quality
Tracking and Tracing
Timeliness

The Logistics Performance Index (LPI) is calculated using six key components, with the exception of the “domestic logistics costs” indicator, which was included only in the 2007 index and not included in subsequent years. None of these components alone is sufficient to demonstrate a high level of logistics performance. A sound assessment of logistics performance requires a combined consideration of all these components. In this context, the components that make up the LPI and their contents are explained below (Arvis et al., 2023);

- Customs: Refers to the efficiency of customs processes and related institutions, encompassing the speed, transparency, and predictability of customs procedures.
- Infrastructure: Evaluates the quality and adequacy of telecommunications, information technologies, ports, railways, and other physical infrastructure elements supporting transportation and trade.
- International Shipments: Measures the ease of organizing international shipments at competitive costs.
- Service Quality: Reflects the quality and adequacy of logistics services provided by actors such as transport operators, logistics service providers, and customs brokers.
- Tracking and Tracing: Evaluates the capacity to track shipments throughout the supply chain and the effective tracking of shipments.
- Timeliness: Measures the frequency with which logistics service providers deliver shipments within planned or expected timeframes.

High logistics performance facilitates countries' access to new markets by enabling faster, more reliable, and lower-cost transportation of goods and services; this contributes to the increase in international trade volume and the promotion of commercial activities. Therefore, logistics plays a critical role in the international competition process. While logistics performance is crucial in increasing the international trade volume of countries, inadequate logistics infrastructure and services limit the integration of countries into global supply chains and consequently weaken their global competitiveness. In this context, it is of great importance for countries to regularly evaluate and compare their logistics performance in order to optimize logistics processes and increase efficiency in international trade (Çelebi et al., 2025: 574).

These components encompass different dimensions that have an impact beyond distance and transportation costs in logistics processes and define the Logistics Performance Index. The Logistics Performance Index (LPI) is calculated using Principal Component Analysis (PCA), a widely used method to reduce the dimensionality of the data set. In this context, the input for PCA is the average country-based scores of all stakeholders participating in the survey regarding their evaluations of foreign markets. Before the analysis, the obtained data is normalized by subtracting it from the sample mean and dividing by the standard deviation. The output obtained from the PCA is a weighted index value representing logistics performance. In the process of creating the International LPI, the normalized scores are multiplied by the relevant component weights, and these values are combined to calculate the index. Due to the similarity of the weights used, the resulting international LPI value can largely be interpreted as an average performance indicator (Beysenbaev & Dus, 2020: 36). The index is calculated based on stakeholders participating in the survey rating each criterion on a scale of 1 (lowest performance) to 5 (highest performance). According to the evaluation results, countries ranking high in the index are seen to have developed distribution networks and sectors specialized in logistics services. Furthermore, it is noteworthy that these countries effectively utilize economies of scale and widely employ advanced technological innovations. In contrast, the lower ranks generally consist of low-income countries; these countries are mostly landlocked, geographically isolated, or negatively affected by instability and conflict (Manavgat & Demirci, 2021: 1861).

3. The Conceptual Relationship Between Global Competitiveness And Logistics Performance

Logistics, a fundamental element of international trade, encompasses numerous activities, including freight transport, warehousing, border crossing, payment systems, and many others, performed by private service providers on behalf of businesses and freight forwarders. However, logistics is of strategic importance not only to the private sector but also to the public policies of national governments and regional and international organizations. (Arvis et al., 2012). Evaluating logistics efficiency at the country level is crucial for better examining and implementing trade and transportation facilitation policies in the long term and across countries. A country that gains a competitive advantage in logistics efficiency increases international trade volume, facilitates access to new markets, and stimulates business growth. Country-specific logistics performance assessments not only reveal the relative position of each country but also identify priority areas for improvement, such as infrastructure, service processes, and regulatory frameworks. Companies with high-quality and cost-effective logistics capabilities outsource some of their logistics operations, allowing them to allocate more of their limited internal resources to these processes. For example, delivery times are shorter and more reliable in countries with improved road infrastructure and predictable customs processes. Indeed, as Lean et al. (2014) emphasize, a country's economic development process increases demand for logistics services; this, in turn, creates the need to develop logistics capacity and infrastructure.

A country's success in improving its logistics performance depends significantly on its national competitiveness. Logistics is a complex system consisting of integrated and coordinated applications and processes, and its overall performance depends considerably on public policies such as infrastructure development, the improvement of the regulatory framework related to transportation services, and the planning and implementation of effective customs processes. Indeed, these areas are directly linked to the improvement of indicators reflecting a country's level of global competitiveness. With the intensification of global competition, it is often impossible for businesses to implement all the necessary measures to become more competitive on their own. Therefore, structural and institutional improvements at the national level are critically important, especially for sectors directly related to logistics activities (Ekici et al., 2016: 118).

Numerous factors influencing competitiveness, particularly economic growth, have been extensively studied by many researchers. In this context,

the logistics sector plays a significant role in a country's development process (Chen and Novy, 2011). Nguyen and Tongzon (2010) emphasize that the growth in international trade directly impacts the transport and logistics sector, increasing demand for transport services and creating new opportunities for businesses to expand their business areas.

Furthermore, developments in the logistics sector are also expected to support economic growth by increasing production, consumption, and trade volume. For example, it is frequently stated in the literature that a more developed infrastructure contributes to attracting foreign direct investment (Lean et al., 2014; Banister & Berechman, 2001). In this context, a bidirectional causal relationship between logistics and trade has been identified and assumed.

However, the practical validity and direction of this reciprocal interaction are not always clear. Similarly, the relationship between logistics performance and competitiveness is bidirectional, and while there is a strong link between these two elements, it is difficult to make a clear distinction as to which is the cause and which is the effect (Ekici et al., 2016: 119).

The literature generally acknowledges a strong, complementary, and largely bidirectional relationship between the Logistics Performance Index (LPI) and the Global Competitiveness Index (GCI). High logistics performance increases countries' international trade volume and investment attraction capacity by reducing trade costs, facilitating market access, accelerating delivery processes, and increasing reliability; this, in turn, positively impacts the GCI, a significant indicator of competitiveness. On the other hand, GCI components such as strong institutional structure, macroeconomic stability, efficient market functioning, and innovation capacity contribute to the improvement of the LPI by supporting the sustainability of logistics infrastructure investments and the development of logistics service quality. In this context, while logistics performance is considered one of the fundamental elements that increase competitiveness, a competitive economic structure also creates the necessary institutional and economic foundation for the development of logistics systems. Therefore, the relationship between the LPI and the GCI presents a structure where the direction of causality cannot be clearly separated, but is shaped on the basis of mutual interaction and complementarity (Sergi et al., 2021).

4. Discussion and Conclusion

One important study designed to demonstrate the role of logistics in the economy is the Logistics Performance Index (LPI), published biennially

by the World Bank. The LPI is a benchmarking tool designed to identify strengths and weaknesses in logistics by assessing countries' logistics performance from a development perspective. Based on a weighted average of key indicators reflecting the efficiency and effectiveness of logistics processes, the index provides an important benchmark for policymakers and industry stakeholders. Competitiveness is a multidimensional concept applicable to various economic entities, such as companies, sectors, and countries. This study, focusing on country-level competitiveness, is based on the Global Competitiveness Index (GCI). According to the World Economic Forum, competitiveness is defined as the sum of institutions, policies, and factors that determine a country's productivity level, and this productivity level directly affects income and welfare levels (WEF, 2013).

The multifaceted nature of competitiveness and logistics performance, and their crucial roles in economic growth and development, have led to extensive discussions of these concepts in the literature. In particular, the measurement of competitiveness at the national level, the identification of its determinants, and the examination of its relationship with logistics performance have been the subject of numerous empirical and conceptual studies across various periods and country groups. Within this context, the main studies addressing the relationship between competitiveness and logistics performance are presented below.

Kabak, Ekici and Ülengin (2020), in an empirical study based on two main indices, GCI and LPI, analyzed the components of the Global Competitiveness Index (GCI) that significantly affect the logistics performance of countries, namely business development, financial market development, infrastructure, goods market efficiency and higher education and vocational training.. Çemberci, Civelek, and Canbolat (2015) examined the moderating effect of the Global Competitiveness Index on the sub-dimensions of the Logistics Performance Index and found that the GCI has a statistically significant effect on the dimensions of international shipments, tracking and tracing, and on-time delivery. The study shows that countries should focus on improvements in these logistics service dimensions in order to increase their global competitiveness. Erenel Yaşlıca and Gündüz (2024) examined the mediating role of corporate governance in the relationship between logistics performance and global competitiveness and found that corporate governance has a significant effect on both variables. The study findings emphasize that countries need to increase transparency in governance, improve bureaucratic regulations, and ensure openness in customs processes in order to enhance their global competitiveness.

When the studies in the literature are considered together, it becomes clear that there is a close, multifaceted, and reciprocal interaction between logistics performance and global competitiveness. Increasing the efficiency of logistics infrastructure and services strengthens countries' integration into global supply chains, thereby supporting their competitiveness; while competitiveness elements such as institutional structure, governance quality, the functioning of the financial system, and market efficiency provide the necessary institutional and economic framework for improving logistics performance. Accordingly, the literature reveals that for countries to achieve sustainable competitive advantage, they should consider logistics performance not only as an operational element but also as a strategic policy area integrated with institutional and governance dimensions.

5. References

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