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The Moderator Effect of Global Competitiveness Index on Dimensions of Logistics Performance Index

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Abstract

The most important assessment tool that demonstrated the comparative situation of countries is Logistics Performance Index (LPI) created by World Bank. This index which has been prepared as a questionnaire consists of six dimensions. These dimensions are Customs: The efficiency of clearance process, Infrastructure: Quality of trade and transport related infrastructure, International Transportation: Capability of arranging competitively priced shipments, Logistics Competence: Competence and quality of Logistics Services, Tracking and Tracing: ability to track and trace your consignments, Timeliness: Carrying out the transports at scheduled time. In this research, moderating effect of Global Competitiveness Index (GCI) on each dimensions of LPI was measured. The moderating effect was measured by means of hierarchical regression method. As a result of the analysis, the moderating effects on three of the six dimensions have been found as statistically significant. These dimensions are International Transportation: Capability of arranging competitively priced shipments, Tracking and Tracing: ability to track and trace your consignments and Timeliness: Carrying out the transports at scheduled time. Due to not being any research based on the dimensions of two indexes (LPI and GCI) before, this research can be considered as a breakthrough in literature. The most important contribution of this research is that it allows evaluating logistics performance over the top as to increase the size of a country's global competitiveness index. In other words, according to the result of this research, if a country targets to the top level in GCI index, it needs to make important improvements in the following dimensions of logistics services: International Transportation, Tracking and Tracing and Timeliness.

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Keywords: GCI, Hierarchical Regression, Logistics, LPI, Moderating Effect

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1. Introduction

The most important work demonstrating the comparative situation of the world logistics sector among countries is the Logistics Performance Index (LPE). This index is organized by the World Bank and consists of six dimensions. LPE is a comprehensive questionnaire study conducted with international forwarders and express carriers across the world. This questionnaire evaluates the participants' performances in the field of logistics, such as the customs processes of their own countries and of the countries where they conduct carrying, their service quality and their infrastructure. The Trade and Carriage department of the World Bank designs and implements the LPE questionnaire with contributions from the Turku School of Economics of Finland. Various international transport associations and institutions support the World Bank in preparing and implementing this questionnaire. In the LPE 2014, the last of the LPE researches, the first two of which were carried out in 2007 and in 2010, Turkey ranks 30th with 3,50 points over 5. In the LPE 2014, where the first 10 appears to consist of countries with higher income levels, generally countries that play an important role in the global and regional supply chain and that have a settled logistics system are higher in the list. It is seen that the countries of the middle income level group that have with a high performance score are those that have rapidly growing economies.

The most important indicators that tell us about a country's development level are country's economic indicators. If these indicators are in a positive direction, this affects that country positively economically, socially, culturally and psychologically. The most important factor in the changing of economic indicators is logistics. In the recent years logistics has gained importance due to the fact that countries' foreign trade volume has increased and because of the problems experienced in foreign trade. For this reason, countries must have a sustainable domestic and foreign trade system, and this trade must be supported by logistics strategies in order to ensure the continuity of economic activities (Yılmaz, 2013, p. 62). The Global Competitiveness Report is being published since 1979 in order to rank countries according to their competitive strength (WEF, 2013). The World Economic Forum bases countries' competitiveness ranking according to the Global Competition Index (KRE). While being very comprehensive, this index analyses national competitiveness in terms of macroeconomics. The Global Competition Index (KRE) consists of 12 dimensions. The World Economic Forum makes use of two kinds of data in this study. These are the international digital indicators and the Manager's Opinion Questionnaire. The international digital indicators consist of data such as public debt, budget deficit and life expectancy, which are obtained from international corporations such as the IMF, UNESCO and the World Health Organization (WHO). The Manager's Opinion Questionnaire, on the other hand, uses qualitative data (WEF, 2013). This study is a novelty in the literature as no research demonstrating the relationship of these two indexes in terms of dimensions was conducted previously. The most important contribution of this study is that it has ensured the evaluation of a country's being placed at the top ranks in the global competition index over its logistics performance dimensions.

2. Literature Review And Hypotheses

The Logistics Performance Index is a questionnaire research conducted through the participation of institutions and corporations under the World Bank. The World Bank published this index first in 2007 and then in 2010, 2012 and 2014. The Logistics Performance Index prepared to measure countries' level of development in terms of logistics consists of six dimensions. The logistics infrastructure and the effectiveness of the systems are very important in calculating this index. One-on-one interviews and inspections are taken into consideration during grading (Tanyas & Arıkan, 2013). This index that attracts the attention of the business world is a study conducted by the World Bank, logistics service providers and scholars. The status of 160 countries according to these six dimensions and comparisons between the countries are revealed thanks to the "questionnaire study" forming the index (International Transporters Association, 2014). The Logistics Performance Index is determined as a result of the questionnaires addressing 1000 company managers in 130 countries. 45% of the managers participating in the questionnaire are from high-income countries, 45% from middle-income countries and 10% are from low-income countries. 45% of these managers work for large companies while 55% work for medium and small companies. Also, 35% of the managers are high-ranking managers, 25% are field managers, 24% are department managers and

26% are low-level managers (Burmaoğlu, 2012) In order that our country, which ranks 17th in the world economic size ranking, reaches the desired level also in the logistics performance index, the World Bank LPE study must be taken in to consideration in the country's logistics planning (Loder, 2014). The 80% confidence interval determined for country data is an important point of the LPE data. The confidence interval is used to determine the lower and upper limits of the Logistics Performance Index results. While the confidence interval is calculated, the standard error of the LPE values has been calculated for all subjects completing the questionnaire on country basis. The values obtained by countries are ranked according to whether they are closer to the lower or upper limit (Arvis, Saslavsky, L. Ojala, Shepher, Busch & Raj, 2014).

3. Conceptual Framework

3.1. Logistics Performance Index (LPI)

In this survey we aim to identify the mediating effect of learning orientation on the relationship between leadership style and firm performance. To test the propositions, a field survey using questionnaires was conducted The Logistics Performance Index (LPE) was created by the World Bank in order to measure the countries' logistics performance. These measurements are ranked by asking questions to employees and managers of various logistics companies of each country and determining the replies according to the scores. The LPE 2012 questionnaire was held in 2011, attended by approximately 1000 sector employees from 143 countries. The scope of the questionnaire covers 155 countries. 56% of the participants work in middle-income level countries while %13 works in low-income level countries. Employees of large companies with 250 and more employees constitute 18% of the participants. The remaining participants work in medium- and small-size companies. It is seen that the participants are chosen not only from company headquarters, but also from people in country offices, involved in day-to-day operations. According to the results of the questionnaire, the weighted averages determine the performances of the countries in the 6 dimensions. These 6 dimensions are;

- The efficiency of customs and customs clearance processes,
- The quality of infrastructure related to trade and transport,
- Competitive pricing in loading,
- Quality and adequacy of logistics services,
- Traceability of the shipments,
- The timely arrival at their destinations of the freight.

The above six LPE dimensions are fundamentally divided into two categories:

- The policy regulation areas containing the basic inputs of the supply chain (quality infrastructure and logistics services),
- Service offering performance outputs (timing, regulation of shipments, monitoring and traceability)

LPE was first created in 2007 and repeated in 2010. According to the results, the LPE scores of countries such as Germany, Singapore, Sweden, the Netherlands and Luxembourg have been between 3.97 and 4.10. During the first evaluation Turkey was placed 34th, but found a place as 39th in the scoring repeated in 2010 (RYKGM, 2014).

3.2. Dimensions of The Logistics Performance Index

The LPE contains over 6000 evaluations conducted by logistics professionals (with 1000 international logistics agencies) in order to compare the logistics profiles of 160 countries, and consists of a total of six dimensions (RYKGM, 2014).

3.2.1. Infrastructure: The Quality of Infrastructure Related to Trade and Transport

The participants to the questionnaire were asked to evaluate the quality of the infrastructure related to commerce and transport in their country (ports, highways, airports, railroads, Storage/loading facilities, telecommunication and IT) (Connecting To Complete 2010, Trade Logistics in the Global Economy; The Logistics Performance Index

and Its Indicators, 2010). Looking at the LPE results for 2010 and 2012, it is seen that positive opinion on certain infrastructure types is increasing throughout the world. The field in which all of the participants indicate the highest number of positive opinion is seen to be Information and Communication Technologies. On the other hand, the rate of providing positive opinion on the railroad infrastructure ranks lowest among all infrastructure types (Burmaoğlu, 2012). The national LPE results for Turkey indicate a parallelism with the above-mentioned general indicators with respect to infrastructure. 60% of participants domiciled in Turkey evaluate railroad quality as low. Considering only the data covering developing countries in the report submitted by the World Bank, it is seen that the data for the Europe and Central Asia region containing Turkey are parallel to the data for the Upper-Medium Income group.

3.2.2. Cargo Monitoring: Traceability of the Shipments

The continuity of the shipments is necessary to ensure the continuity of the logistics and supply chain. Thanks to today's technology, companies are able to monitor their goods and to manage the movements within their supply chains. Smart transport systems play an important role in monitoring the flow of materials. Smart transport systems have added value features that cut down on costs and ensure customer satisfaction. The advantages of the monitoring and tracking systems are a decrease in communication costs, an increase in competitive advantage, effective fleet management, the instant monitoring of the speed and routes of vehicles, an increase in customer satisfaction by providing customers with information, ensuring flexibility through the monitoring of cargo on the vehicles and directing new cargo to the closest vehicles at the time of order, increasing security and determining the times of arrival of the products at the required destinations (Ünlü, 2007).

3.2.3. Timing: Timely Arrival of Shipments at their Destinations

The participants of the questionnaire consider the dimension of the timely arrival of shipments at their destinations with the sub-dimensions of compulsory storage/loading, pre-loading inspection, transfer at sea, criminal activities (theft of the cargo) and unofficial payment requests. The time necessary for the completion of commercial transactions is considered an important indicator on a country's logistics performance. According to the results of the LPE 2012, the export transaction times of countries demonstrating a low performance are 3,5 times higher than countries that have a high performance. The reasons for this are stated as geographical difficulties, problems arising from national transportation and delaying factors at the customs. It appears that a reform is needed in border and customs management in order to ensure progress with respect to time. It is mentioned that an important progress will be obtained in import and export times in the event that bureaucratic and unnecessary procedures are abolished and physical inspections are minimized. According to general data, since transactions related to the export supply chain are less procedural, they are completed in a shorter time compared to import transactions.

3.2.4. International Transport: Competitive Pricing in Loading

Developing the logistics performance is one of the most important policies in order to ensure international competition and integration in international trade. International trade research indicates that a decrease in logistics costs in developing countries has the largest potential in decreasing trade costs.Participants of the questionnaire consider competitive pricing with the sub-dimensions of port fees, airport fees, railroad fees, storage/loading fees and agent's fees. Logistics should not only be seen as transport or the facilitation of trade. Logistics also denotes a larger field that includes the development of the services, transport facilities and the infrastructure. It has been seen that the logistics priorities have changed both at global level and at country level, especially at the level of low-income countries, since the 2007 report was published. Today, the subjects of logistics effectiveness and the facilitation of trade have found a higher place in the agendas of policy-makers, private companies and international organizations. Many developing countries have initiated reforms to ensure the effectiveness of the supply chain and to facilitate trade and transport services.

3.2.5. Customs Clearance: The Efficiency of Customs and Customs Clearance Processes

Participants of the questionnaire consider the Efficiency of Customs and Customs Clearance Processes with the sub-dimensions of the delivery and control of imports, the delivery and control of exports, the transparency of customs controls, the provision of timely information in regulatory transaction changes and accelerated customs clearance for traders having a high compliance level (Connecting to Complete 2010, The Logistics Performance Index and Its Indicators, 2010, pp. 42-43). Although Turkey has demonstrated a very significant development compared to previous years with respect to the effectiveness of customs transactions, it is observed that the most important criterion to be taken into consideration is the speed and effectiveness of the customs transactions. The problems experienced in this field may be listed as the inadequacy of the physical infrastructure in the areas where the customs transactions are carried out and slowdown in the workflow due to technical infrastructure failures that are seen from time to time in the customs documents automation system. Also, the fact that the customs are the last point in export and import transactions, that it is the body that implements all legislation and that the follow-up of transactions carried out by other bodies as well as the legal obligations related to these bodies are conducted at the customs gives rise to the perception that all of the problems arise from the customs (Koban, 2012). The LPE includes many indicators related to border transactions and times. A useful criterion of logistics performance is the time that commercial transactions take to be completed. As in the study of 2012, in 2014 to the LPE research indicates that the delivery time in import, at the port and airport supply chains is greater by more than 2 times in countries demonstrating a low performance compared to countries that demonstrate a high performance. This ratio was 3,5 times in 2012. This difference is 3 times higher in highway supply chains. In both cases these times are connected with distance. This relationship indicates that geographical obstacles and the domestic transport markets continue to pose serious difficulties for certain countries (Economic Analysis and Evaluation Office, 2014). Similar to the differentiation of logistics performance according to income groups, the export delivery times also demonstrate a differentiation. In low-income countries, export delivery times are 3-4 times greater compared to high-income countries (Economic Analysis and Evaluation Office, 2014).

3.2.6. Services (Competence): Quality and Adequacy of Logistics Services

Participants were asked to evaluate the adequacy and quality of the services in their countries (Connecting to Complete 2010, The Logistics Performance Index and Its Indicators, 2010, p. 41). The quality and adequacy of logistics services are examined through the sub-dimensions of highways, railways, air transport, maritime transport, storage/loading facilities, transport agents, customs administrations, quality and standard inspection institutions, health and plant health inspection institutions, customs brokers, trade and transport institutions and receivers and senders. The adequacy and quality of basic logistics services are important indicators in the performance of the entire country. Transport agents have been given a higher score compared to other service providers for countries in the lowest three LPE groups. Railroad transport has obtained low scores in keeping with the score of the railroad infrastructure (Economic Analysis and Evaluation Office, 2014). Generally, the transaction load of export supply chains is less heavily compared to import supply chains. Therefore, delivery times are shorter in export compared to import

4. Global Competitiveness Index (GCI)

Global Competitiveness Index is evaluating countries in terms of corporate and political aspects in long and short time. At calculating the index it is utilized from 12 dimensions and three basic factors that were formed by complementary data (Ovalı, 2014).

4.1. Dimensions of Global Competitiveness Index

Competitiveness ranking is based on Global Competitiveness Index (GCI) by World Economic Forum. This index is comprised of a vast structure which analyzes the macroeconomic situations national competitiveness. GCI

is formed by weighted mean of 12 dimensions which affects the competitiveness ranking. World Economic Forum (WEF) makes use of two types of data in this research. The first group data is obtained from international numerical indicators. The second group of data is obtained from the Executive Opinion Survey. GCI provides statistical data such as public debt, budget deficit and life expectancy from international organizations like IMF, UNESCO and WHO (RYKGM, 2014). Another source that GCI uses for competiveness ranking is Executive Opinion Survey prepared annually by WEF. Qualitative data is mainly used in this survey. Questions contained in the survey is structured in a way that given a score between 1 and 7. In this survey, "1" the worst grade and "7" represents the best grade. The survey is carried out through more than 150 partner organizations from different countries.

5. Research Model

Figure 1. shows the conceptual model regarding the moderator effect of Global Competiveness Index (GCI) on the dimensions of Logistics Performance Index (LPI). This model tries to explain which dimensions of LPI are related with GCI. Therefore moderator effect is measured for each dimension separately.

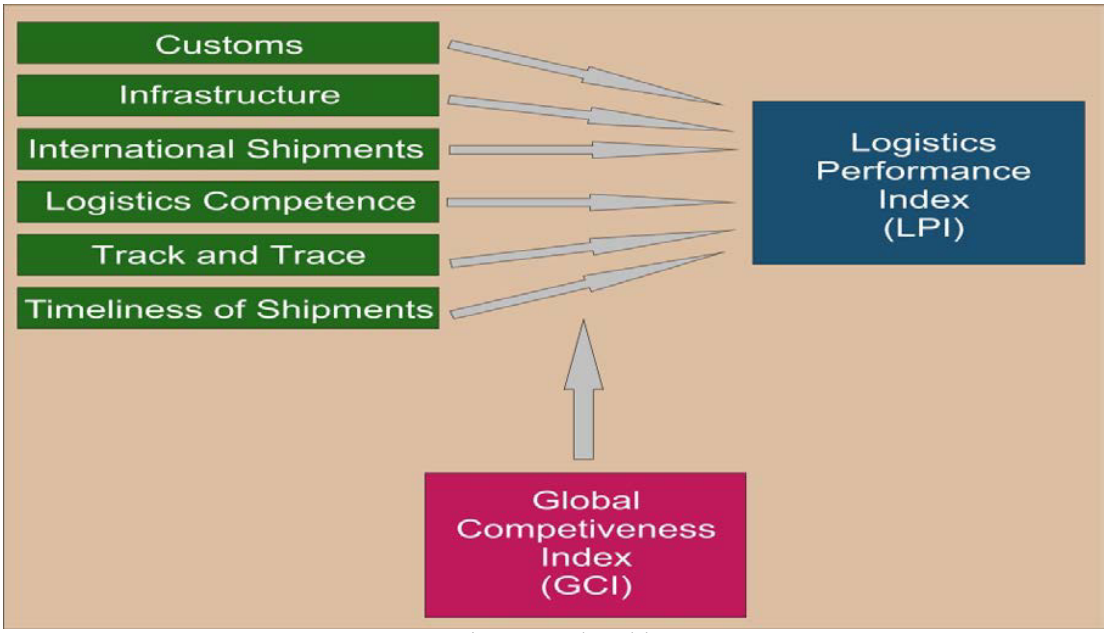

Fig. 1. Research Model

Hypothesis of the research are shown on the Table 1. For each dimensions of LPI, different hypothesis are put forward.

Table 1. Summary of Hypothesis

*H_1: Global Competiveness Index has moderator effect on the influence of **Customs** on Logistics Performance Index.*
*H_2: Global Competiveness Index has moderator effect on the influence of **Infrastructure** on Logistics Performance Index.*
*H3: Global Competiveness Index has moderator effect on the influence of **International Shipments** on Logistics Performance Index.*
*H4: Global Competiveness Index has moderator effect on the influence of Logistics **Competence** on Logistics Performance Index.*
*H_5: Global Competiveness Index has moderator effect on the influence of **Track and Trace** on Logistics Performance Index.*
*H_6: Global Competiveness Index has moderator effect on the influence of **Timeliness of Shipments** on Logistics Performance Index.*

Hierarchical Regression Analysis

In this research, hierarchical regression analysis was implemented to each dimensions of Logistics Performance Index. Moderator effects of GCI were tried to explain on each dimensions of LPI separately. In order to conduct moderator variable analysis, method suggested by Baron and Kenny (1986) was used. In this method two stages regression analysis were implemented. In first stage, independent variable regressed to dependent variable. In second stage, independent variable, moderator variable and multiplication variable derived from standardized form of moderator and independent variables regressed to dependent variable. Regression equations for each hypothesis are as follows:

H_1: Global Competiveness Index has moderator effect on the influence of Customs on Logistics Performance Index.
The model summaries of hierarchical regression analysis are shown in Table 2.
MODEL 1: $LPE = \beta_0 + \beta_1.G + \varepsilon$
MODEL 2: $LPE = \beta_0 + \beta_1.G + \beta_2.KRE + \beta_3.G'.KRE' + \varepsilon$

Table 2. Hierarchical Regression Model Summaries

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	,948[a]	,898	,897	,16952
2	,956[b]	,913	,911	,15752

a. Variables: Customs
b. Variables: Customs, GCI, Multiplication Variable

As shown in Table 2, difference between R^2 value of Model 1 and R^2 value of Model 2 was found as 0,015. This value of increase is relatively low. Coefficients of the models are as shown in Table 3.

Table 3. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		β	Std. Error	β		
1	Constant	,612	,072		8,556	,000
	Customs	,848	,025	,948	34,096	,000
2	Constant	,341	,091		3,747	,000
	Customs	,677	,044	,757	15,487	,000
	GCI	,000	,014	,000	,008	,000
	Multiplication Variable	,250	,052	,227	4,775	,994

As shown in Table 3 Multiplication Variable is not statistically meaningful in % 5 meaningful levels. Considering R^2 change, Global Competiveness Index has not moderator effect on the influence of Customs on Logistics Performance Index.

H_2: Global Competiveness Index has moderator effect on the influence of Infrastructure on Logistics Performance Index.
MODEL 1: $LPE = \beta_0 + \beta_1.A + \varepsilon$
MODEL 2: $LPE = \beta_0 + \beta_1.A + \beta_2.KRE + \beta_3.A'.KRE' + \varepsilon$
The model summaries of hierarchical regression analysis are shown in Table 4.

Table 4. Hierarchical Regression Model Summaries

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	,970[a]	,941	,941	,12877
2	,971[b]	,943	,942	,12727

a. Variables: Infrastructure
b. Variables: Infrastructure, GCI, Multiplication Variable

As shown in Table 4, difference between R^2 value of Model 1 and R^2 value of Model 2 was found as 0,002. This value of increase is relatively low. Coefficients of the models are as shown in Table 5.

Table 5. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Standardized Coefficients
		β	Std. Error	β		
1	Constant	,715	,051		14,021	,000
	Infrastructure	,793	,017	,970	45,949	,000
2	Constant	,603	,075		8,015	,000
	Infrastructure	,763	,037	,933	20,667	,000
	GCI	,072	,047	,065	1,525	,130
	Multiplication Variable	-,019	,012	-,038	-1,574	,118

As shown in Table 5 Multiplication Variable is not statistically meaningful in % 5 meaningful levels. Considering R^2 change, Global Competiveness Index has not moderator effect on the influence of Infrastructure on Logistics Performance Index.

H3: Global Competiveness Index has moderator effect on the influence of International Shipments on Logistics Performance Index.

MODEL 1: $LPE = \beta_0 + \beta_1.U + \varepsilon$

MODEL 2: $LPE = \beta_0 + \beta_1.U + \beta_2.KRE + \beta_3.U'.KRE' + \varepsilon$

The model summaries of hierarchical regression analysis are shown in Table 6.

Table 6. Hierarchical Regression Model Summaries

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	,924[a]	,892	,852	,20342
2	,975[b]	,963	,911	,15779

a. Variables: International Shipments
b. Variables: International Shipments, GCI, Multiplication Variable

As shown in Table 6, difference between R^2 value of Model 1 and R^2 value of Model 2 was found as 0,071. This value of increase is higher than 0,05. Coefficients of the models are as shown in Table 7.

Table 7. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		β	Std. Error	β		
1	Constant	-,230	,118		-1,946	,054
	International Shipments	1,089	,039	,924	27,695	,000
2	Constant	-,382	,095		-4,008	,000
	International Shipments	,762	,049	,646	15,426	,000
	GCI	,358	,047	,326	7,653	,000
	Multiplication Variable	,059	,014	,110	4,102	,000

As shown in Table 7 Multiplication Variable is statistically meaningful in % 5 meaningful levels. Considering R^2 change, Global Competiveness Index has moderator effect on the influence of International Shipments on Logistics Performance Index.

H4: Global Competiveness Index has moderator effect on the influence of Logistics Competence on Logistics Performance Index.

MODEL 1: $LPE = \beta_0 + \beta_1.L + \varepsilon$

MODEL 2: $LPE = \beta_0 + \beta_1.L + \beta_2.KRE + \beta_3.L'.KRE' + \varepsilon$

The model summaries of hierarchical regression analysis are shown in Table 8.

Table 8. Hierarchical Regression Model Summaries

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	,977[a]	,954	,954	,11376
2	,979[b]	,959	,958	,10838

a. Variables: Logistics Competence

b Variables: Logistics Competence, GCI, Multiplication Variable

As shown in Table 8, difference between R^2 value of Model 1 and R^2 value of Model 2 was found as 0,05. Coefficients of the models are as shown in Table 9.

Table 9. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		β	Std. Error	β		
1	Constant	,274	,053		5,166	,000
	Logistics Competence	,920	,018	,977	52,367	,000
2	Constant	,182	,061		2,976	,003
	Logistics Competence	,813	,032	,863	25,221	,000
	GCI	,131	,037	,119	3,555	,001
	Multiplication Variable	,015	,010	,030	1,555	,122

As shown in Table 9 Multiplication Variable is statistically meaningful in % 5 meaningful levels. Considering R^2 change, Global Competiveness Index has moderator effect on the influence of Logistics Competence on Logistics Performance Index.

H_5: Global Competiveness Index has moderator effect on the influence of Track and Trace on Logistics Performance Index.

MODEL 1: $LPE = \beta_0 + \beta_1.Y + \varepsilon$

MODEL 2: $LPE = \beta_0 + \beta_1.Y + \beta_2.KRE + \beta_3.Y'.KRE' + \varepsilon$

The model summaries of hierarchical regression analysis are shown in Table 10.

Table 10. Hierarchical Regression Model Summaries

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	,946[a]	,903	,901	,15656
2	,979[b]	,955	,955	,12477

a. Variables: Track and Trace

b. Variables: Track and Trace, GCI, Multiplication Variable

As shown in Table 10, difference between R^2 value of Model 1 and R^2 value of Model 2 was found as 0,052. This value of increase is higher than 0,05. Coefficients of the models are as shown in Table 11.

Table 11. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		β	Std. Error	β		
1	Constant	,284	,074		3,823	,000
	Track and Trace	,904	,024	,956	37,226	,000
2	Constant	,014	,071		,200	,841
	Track and Trace	,681	,032	,720	21,354	,000
	GCI	,307	,037	,279	8,299	,000
	Multiplication Variable	,024	,012	,045	2,033	,044

As shown in Table 11 Multiplication Variable is statistically meaningful in % 5 meaningful levels. Considering R^2 change, Global Competiveness Index has moderator effect on the influence of Track and Trace on Logistics Performance Index.

H_6: Global Competiveness Index has moderator effect on the influence of Timeliness of Shipments on Logistics Performance Index.

MODEL 1: $LPE = \beta_0 + \beta_1.Z + \varepsilon$

MODEL 2: $LPE = \beta_0 + \beta_1.Z + \beta_2.KRE + \beta_3.Z'.KRE' + \varepsilon$

The model summaries of hierarchical regression analysis are shown in Table 12.

Table 12. Hierarchical Regression Model Summaries

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	,930[a]	,864	,863	,19566
2	,958[b]	,917	,915	,15388

a. Variables: Timeliness of Shipments

b. Variables: Timeliness of Shipments, GCI, Multiplication Variable

As shown in Table 12, difference between R^2 value of Model 1 and R^2 value of Model 2 was found as 0,054. This value of increase is higher than 0,05. Coefficients of the models are as shown in Table 13.

Table 13. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		β	Std. Error	β		
1	Constant	,025	,104		,244	,808
	Timeliness of Shipments	,883	,030	,930	28,978	,000
2	Constant	-,190	,092		-2,072	,040
	Timeliness of Shipments	,611	,039	,643	15,849	,000
	GCI	,365	,045	,332	8,124	,000
	Multiplication Variable	,043	,016	,076	2,783	,006

As shown in Table 13 Multiplication Variable is statistically meaningful in % 10 meaningful levels. Considering R^2 change, Global Competiveness Index has moderator effect on the influence of Timeliness of Shipments on Logistics Performance Index.

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