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A meta-synthesis of trade logistics influence on international trade

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Logistics systems are inexplicably linked to trade and investment, and their significance in describing a country's competitiveness in an increasingly globalized world is growing. Improved trade logistics, in conjunction by a way of more economic liberalization climate, increased volume and size of trade, as well as reach in distribution and production activities. With careful reviews, the study discussed a meta-synthesis of trade logistics influence on international trade where about twenty-two papers across publishers were analyzed to observe their findings. According to several reports, the availability and consistency of physical infrastructure for effective transportation and logistics services, regulations, poor implementation, procedures, corruption at ports, and cargo handling costs all got a significant influence on a trade and competitiveness performance of the Nation. In order to meet consumer demand, exporting companies could develop reverse logistics systems while focusing on sustainable development. However, to make the understanding of the level of logistics of trade impacts on international trade, the response of logistics growth in international trade requires more in-depth research.

Keywords: Trade logistics, meta-synthesis, international trade, sustainable development, transportation, logistics performance.

INTRODUCTION

Transport and logistics services promote foreign and contribute significantly to the local economy's growth and development. The quality and reliability of logistics services can have significant impact on international trade, as a lack of logistics infrastructure and operational processes can be a significant barrier to global trade integration (Devlin and Yee, 2005). Improved trade related logistics, in combination with a more liberalized economic climate, will boost trade volume and size and reach out in distribution and production activities. International trade has been increasing for decades and is growing at a faster rate than global GDP (Blonigen and

Wilson, 2013). This expansion has placed enormous strain on international transportation markets, which have responded with significant developments, the most notable of which was the introduction of containers in the late 1950s. Along with growing incomes, the resulting reduction in transportation costs between countries has fueled the growth of international trade and interest in developing models that connect trade and transportation. Although the contribution of logistics to a country's national production may not be as competitive as other industries, the role that logistics plays in supporting an economy's activities cannot be underestimated or ignored.

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The facilitation of foreign trade, which, in the right circumstances, delivers national growth and social outcomes, is a well-known connection between transportation and logistics and national development (OECD/WTO, 2013). The transportation and logistics sector is critical in promoting foreign trade because it helps businesses to efficiently complete imports and exports of goods and services, as well as related transactions.

The continued growth of global trade, as well as many countries' willingness to accelerate integration within the global trading system, would depend on more than just maintaining an open global trading system but enhancing the quantity and efficiency of the structures for instance logistics services that can be very supportive. Weak logistics services, such as limited cross-border coordination; inefficiency of customs clearance at ports; fragmented and poor quality transportation-related infrastructure; expensive and infrequent shipping (via long and indirect routes); delays in monitoring and tracing consignments; delays in terminal handling and clearance of goods; lack of cold storage facilities at ports, as well as the failure to certify product quality, are all factors that can stymie foreign trade.

Trade liberalization forces will continue to push countries around the world to increase their involvement in, and realize the rewards of, a globalizing world with expanding opportunities for commerce. The level of development of domestic as well as foreign logistics services can be a critical factor in allowing countries to trade with fewer restrictions and at lower costs. Although better overall logistics services can help shape long-term trade facilitation, the question of whether the level of logistics services encourages further trade is crucial. Infrastructure is vital to the growth of every logistics and supply chain, according to industry experts. The availability and efficiency of physical transportation infrastructure and logistics facilities, as well as cargo handling prices, legislation, and procedures, have a significant effect on a country's trade performance and competitiveness by directly affecting the cost of doing business (Hoekman and Nicita, 2011; Portugal-Perez and Wilson, 2012). Few studies have assessed the direct impact of logistics efficiency on trade and vice versa, to the best of the authors' knowledge. Similarly, the complex relationship between international trade and the logistics and transportation sectors has not received adequate attention. More specifically, there is a need to investigate the transportation sector's response to international growth in greater depth.

LITERATURE REVIEW: LOGISTICS PERFORMANCE ON INTERNATIONAL TRADE

Definition

International trade plays a vital role in any successful

economy. Logistics has become a common term in the world and is no longer the same as it was confined to international companies only, but logistical practices have extended to the level of the world as they can increase competitiveness and its impact on the international sector in demand and supply, and then in international trade. According to Hollweg and Wong (2009), logistics is the ability to transport goods quickly, reliably, and at low cost, ensuring that many problems are solved through its activities such as transport and storage, which contribute to increasing the competitiveness of companies and countries. Transportation is the most essential task in logistics which includes the movement of products facilitates for the territorial crossing of large distances as well as the crossing of boundaries. Cross-border transportation involves a large number of participants, leading to increase of organizational complexities and hence the largest cost considerations for the transnational movement of products are transportation and related control activities. This demonstrates the importance of implementing good transportation networks in order to keep those costs as low as possible (Schieck, 2008). A country's logistics infrastructure consists of its transportation network, which comprises of roads, trains, and canals. The government has a significant impact on such socioeconomic logistical processes and leads to the improvement of businesses that rely upon that quality of the logistics infrastructure. The state also maintains transportation networks and offers organizations for logistical services such as postal service. While considering logistics on a macroeconomic level, logistic services and information systems can also be included. A nation's logistic services, for instance, encompass the broad availability of local vendors and third - party logistics providers. Furthermore, information technologies are critical since they supply decision relevant data for planning and releasing the entire logistical process (Schieck, 2008).

Many researchers Marelli and Marcello (2011), Yanikkaya (2013), Edwards (2011), knew that international trade is a percentage of total trade imports plus exports to the country's national income GDP. Export expansion not only promotes aspect of economic but accelerates economic growth by creating positive externalities through specialization, efficient resource distribution, enhanced manufacturing methods, competitiveness, and economies of scale. The importance of international trade has increased over time due to the availability of surpluses in some countries and the shortage in other countries. Shepherd's (2011) study of logistics data from 45 countries found that the logistics sector accounts for around 5% of GDP on average, with a range of 2% to 12%. Given the rapid increase in global trade since 2000 (as seen below), the logistics sector's contribution to national production in many countries is likely to increase as trade liberalization accelerates and countries become increasingly outward-oriented.

Transport is the costliest aspect of trade logistics, and

sufficient infrastructure is needed to make it possible (Korinek and Sourdin, 2011). If the transportation and logistics sector is unreliable or even unstable, it is difficult for a producer to export or import at a reasonable price. High prices, poor quality, and a lack of confidence in transportation and logistics can effectively isolate a country from global markets.

In their study on air cargo in South Africa, Dettmer et al. (2014) concluded that a more liberal market for air cargo services could reduce transportation costs and encourage further integration. Despite the fact that ports have the greatest impact on trade (Nordas and Piermartini, 2004), port productivity may have a substantial impact on transportation costs. According to an OECD report from 2011, a one-day reduction in time spent at sea could increase trade by 4.5 percent. Shepherd (2011) discovered that in developed countries, pre-shipment delays were linked to a lower level of export diversification. For better trade, logistics governance is essential as the efficiency of logistics improves, public policies relating to trade logistics become increasingly important. Trade logistics policies are critical because the efficiency of logistics is dependent on well-designed government policies. Institutional elements of logistics, such as government legislation, firm-level administrative and operating processes, supply chains, and national trade procedures for inward and outward movement of goods, all play a role in effective trade logistics.

The rapid growth in foreign trade volumes seen over the last two decades necessitates the streamlining of operational bureaucracy such as time-consuming, expensive, and inefficient trade procedures. Complicated trade administrative procedures can build an atmosphere conducive to corruption, which can lead to even more inefficiencies. These behind-the-border barriers, according to Malik and Awadallah (2013), trigger costly frictions in transportation, communication, and services. In the case of the Middle East and North African countries, these writers have argued that the restricted movement of goods and services frequently defies economic logic.

In countries with bad governance and weak trade institutions, there is a risk of trade wars. Traders dealing with public sector employees such as customs officials will face major difficulties in countries with poor governance and weak institutions regulating trade transactions and procedures. They can make customs clearance more difficult by requiring time-consuming inspection procedures (which require needless signatures for clearing goods), customs officials' absence from work, and poor communication and coordination with numerous agencies of government. When bribery is requested by underpaid customs officers, the situation becomes much more complicated. Shepherd (2010) found that weaker trade facilitation (measured by longer lead times to export and import) was linked to higher recorded levels of trade-related corruption, as poor performance gave companies

an opportunity to break the rules by paying "speed money." Hummel (2001) observed similar results in an earlier survey, showing that shippers were willing to pay a premium for quicker delivery.

Empirical findings on trade logistics and international trade

Several findings relating to logistics, supply chain, transportation/port facilities, and trade have been discussed in existing literature, primarily with the aim of exploring the impact of logistics on trade facilitation in a broader context, without examination or thoughtfulness of the direction of causality. For the period 1989-2000, Wilson et al. (2013) investigate the relationship between trade facilitation, trade flows, and GDP per capita in the Asia-Pacific region. They use an augmented gravity model to assess the key trade facilitators as part of their study. Improvements in logistics efficiency were found to result in only modest increases in trade volume. Based on a data set of more than 100 countries for the years 2004 to 2007, Portugal-Perez and Wilson (2012) estimate the effect of aggregate indicators of "soft" and "strong" infrastructure on developed country export results. Their findings indicate that both physical infrastructure and information and communication technology (ICT) have a significant effect, particularly on exports. Gani (2017) examines the overall logistics performance of a large number of countries as well as disaggregated indicators of logistics performance. He claims a strong positive correlation of logistics performance with imports and mostly exports by integrating variables of logistics performance in some conventional export and import equations. Martinez-Zarzoso and Márquez-Ramos (2008) analyze the effect of transportation costs on trade and estimate the elasticity of trade for different subsectors in relation to transportation costs. Their findings indicate that the quality of door-to-door facilities, transportation infrastructure, port performance, and the availability of various modes of transportation are among the most important determinants of transportation costs and international trade, especially in high-value-added industries. The importance of logistic efficiency in worldwide trade was explored by Gani (2017). The findings show that the overall output of logistics is associated significantly with imports and exports.

Martí and Luisa (2017) have studied, while using the gravity model, the importance of logistics in their export of those countries and their finding suggest an improvement in the region, the importance of logistics in international trade and its cost of trade. In addition to promoting their trade, the logistics infrastructure aims at increasing export competitiveness. The structural equation model was used in Munim and Schramm (2018) to empirically analyze the significant economic impact on the quality and performance of the port infrastructure. The results

show that port infrastructure can improve logistics, promote shipping and boost economic growth. Finding that higher charges lead to reductions in supply for established businesses, Lan et al. (2017) examined the association between stringency of environmental regulations and demand for goods and services. The relationship between port efficiency, transportation costs and bilateral trade volume was discussed at Sánchez et al. (2013). They found that improving port efficiency can reduce the cost of transport and increase the volume of bilateral trade.

According to a report conducted by a leading stakeholder in the Nigerian organized private sector (OPS) and the Lagos Chamber of Commerce and Industry (LCCI), the Nigerian economy loses N3.4 trillion in annual revenue due to weak infrastructure, poor execution, and corruption at the ports, with N2.4 trillion in corporate earnings losses across the economy. Profit margins of corporate entities using some of the country's main infrastructure, such as Apapa port, have steadily dwindled as logistics costs have increased significantly, according to the study. An empiric evidence of important economic impacts on port infrastructure quality and logistical performance is a study conducted by Munim and Scharam (2018) using a model of structural equations (SEM). In addition, multigraph SEM analysis is carried out by dividing countries into groups of economies which are both advanced and developing. The results show that the continued improvement of the quality of the harbor infrastructure is essential in developing countries, as it contributes to improved logistics performance, leads to increased trading at sea and increases economic growth. However, as the developing countries become richer, this association weakens.

STUDY'S OBJECTIVE

A literature review on how to trade logistics and its effect on international trade was presented in the previous section. Some research finds a significant relationship between different aspects of trade logistics and foreign trade, according to this literature review. On the other hand, some studies have found no evidence of a connection between certain aspects of trade logistics and international trade. These outcomes suggest that the findings of the relationship between them are inconsistent. In other words, we cannot infer how trade logistics affects foreign trade by virtuously examining the literature. As a result, the aim of this study is to determine the proper relationship between them, which necessitates a systematic meta-synthesis of similarities between the constructs.

RESEARCH METHODOLOGY: A META-SYNTHESIS APPROACHES

The ability to explore intervention programs and evaluate potential

effectiveness in trade logistics with international trade is enabled by a synthesis of such commonalities that can come out from findings of separate studies. Accordingly, Sherwood (1999) believes that the synthesis of the compound results serves to understand the state of the field based on the research analysis as the number of qualitative studies on a certain issue grows, while data from single qualitative investigations are becoming more relevant by comprehending as well as regarding further presenting the results of studies on a similar matter using meta-synthesis. The goal of a meta-synthesis would be to gather all available qualitative knowledge on a specific subject then combine that information into a single presentation that provides a more complete picture of the phenomena. The synthesis of qualitative studies is a growing field that had already attracted increased attention as a valuable form of evidence for enhancing health policies and practices (Mohammed et al., 2016). According to the author, there were multiple efforts throughout the previous decade to develop systems for gathering and synthesizing qualitative data. Although many empirically qualitative research methods on various parts of specific sectors' study have also been published, the compilation and syntheses among those data have not been reported widely, notably in trade logistics on international trade practices similar studies. However, the method of meta-synthesis could give a rich analytical context for analyzing any subject of research with no proof conclusions, according to Raimi and Uzodinma (2020). So application of meta-synthesis is used in this study to combine qualitative data in order to produce a renewed understanding of the topic of interest, which will aid in the development of novel concepts. It brings insights via comprehensive evaluations of descriptive and inferential investigations which integrate previous qualitative research using stringent qualitative approaches to generate deeper sense from an exploratory procedure.

Though the publications got picked between 2000 to the present since it is considered that additional statistical findings may be derived, that will also improve this paper's clarity. This research synthesized the influence of logistics on international trade using data of 22 previous researches which provided trade elasticity. Researchers are expected to form hypotheses regarding those elements if such meta-analysis revealed a positive bond within them. As a consequence, they convincingly argue how meta-analysis is a vital part of theoretical development. This meta-analysis would have to include both substantial and non-significant correlations. It's because of the noteworthy outcomes in sampling that could be related to elements with an insignificant connection (Nair, 2006). Consequently, insignificant correlations should be included in the meta-synthesis (Nair, 2006; Mackelprang and Nair, 2010). Essentially, meta-synthesis allowed scientists to aggregate findings across multiple studies to obtain a broad opinion.

FINDINGS AND DISCUSSION

Papers were gathered simply utilizing keywords including such "Infrastructure," "Public Capital," "Trade," "Export," "Import," "Trade Facilitation," and "Trade Costs" in varying combinations mostly on scholarly browsers JSTOR, Econ Lit, Google Scholar, Springer Link, as well as Web of Science. Researchers remain convinced that perhaps the publications we have chosen represent the great majority of similar empirical investigations on this issue. The only apparent exclusion to this is research which has not been published in English. Many writers create index values which reflect logistics factors in the nations or areas that can be used in main analysis. The index might be defined as the fundamental concept of trade logistics or on sub-

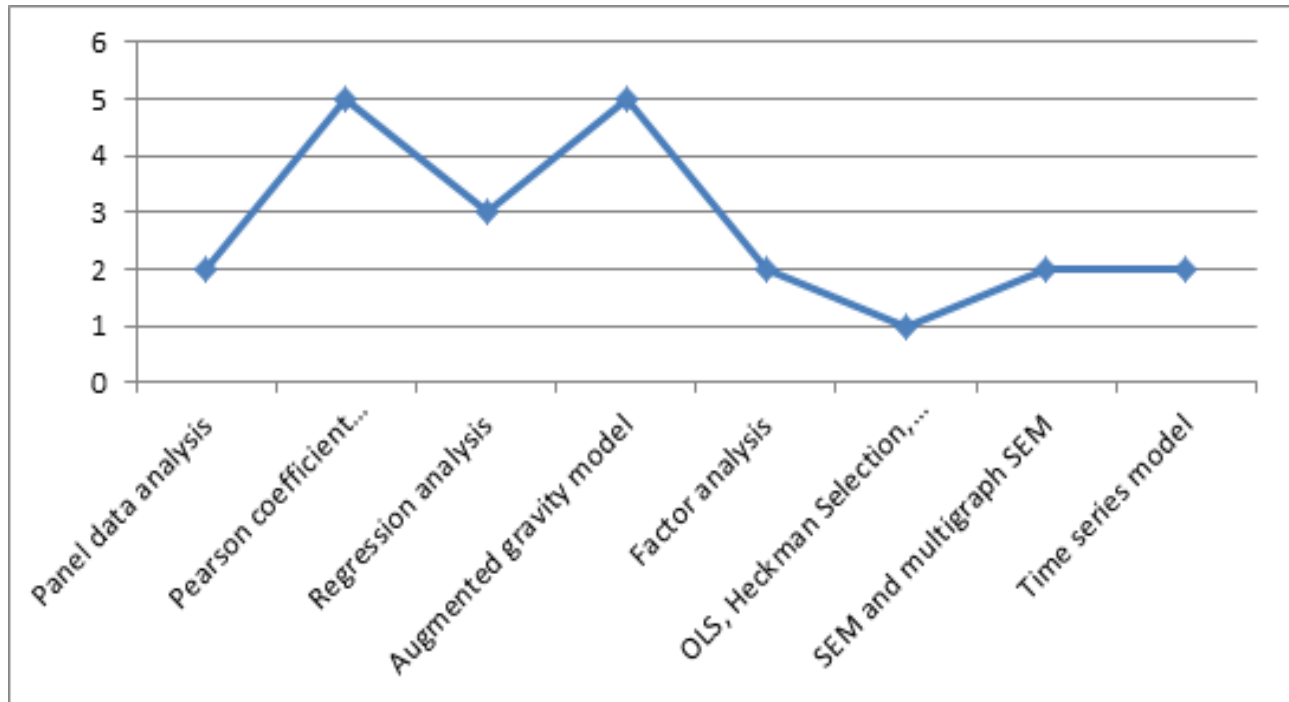


Figure 1. Graph analysis of articles used.

categories including transport or communication infrastructure, export, import, and so on. Nonetheless, the assessment was conducted out by means of occurrence count and percentages.

Tables 1 and 2 as well as Figure 1 reveal several methods used by several authors. It can be deduced that most of the studies made use of the Pearson correlation coefficient and gravity model with (22.7%) respectively. Also, most of their finding revealed that trade logistics has a significant relationship or international trade impact in both developing and developed countries. Finally, most empirical studies have recognized that in international trade, the performance of logistics and international trade in general are important. Results show that logistics and transportation are increasingly important for business in various supply chains, and it is therefore necessary to study and understand how business patterns vary between different groups of countries in the context of economic integration, how the efficiency and the sub-indices of logistics affect trade in different product groups. Most of the studies centers around customs efficiency, infrastructure, international shipping, service quality, cargo tracking capability, and timeliness, which have all been discovered to have a significant impact on the expansion of international logistics on a national level. Secondly, they conclude that the continuous improvement in port infrastructure quality is critical for developing countries because it contributes to improved logistical performance, which leads to increased seaborne trade and economic growth. Therefore, port infrastructure

can help to improve logistics, enhance maritime trade, and stimulate economic growth.

Conclusion

The study examined a meta-synthesis of logistics influence on international trade. Logistics are closely linked to trade and investment and has become increasingly important in describing countries' competitiveness in a globalized world. Increasing world trade requires progress in transport technologies at the same time and quality logistics is a prerequisite for investors to operate efficiently. In order to keep or promote their competitiveness in the global market, exporters should proactively adhere to logistical operations policies through technology innovation or operational optimization and implementation of best practices in logistical operations, such as transportation efficiency, packaging and the design of the supply chain. In addition, exporters could create a reverse logistics system to meet consumer demands and focus on its development. Trade logistics promote effective trade and commerce and assist companies in getting respective products to the consumers, both within including across international boundaries, as a vital part of value chains. As a result, the impact of trade logistics on competitiveness, economic expansion, and creating jobs via international commerce is the focus of this research. These activities can improve exporters' logistics

Table 1. Summary of the article used for meta-synthesis.

Paper	Methods	Trade Logistics and International Trade Variables	Findings
Luttermann, et al. (2017)	Panel data analysis.	For the years 2006-2014 annual information for 20 Asian countries. The Global Competitiveness Index and the Logistics Performance Indices illustrate the countries' logistics systems.	The findings indicate that the relationship between logistics and trade is statistically significant. The main factor affecting exports and imports is transport infrastructure, particularly the quality of roads and ports.
Dong-Fang Wang et al. (2018)	Pearson coefficient correlation	Variables in trade logistics between 2007-2014 for the data from 113 countries and regions	Considering this full sample under perspective, export countries' green logistics performance has a favorable impact on export likelihood or size. The results show that the exporting and importing countries' Logistic Performance Index (LPI) is positively related to the volume of trade and that the LPIs of exporting countries have a positive influence on the probability of commerce.
Limao and Venables. (2001)	Regression analysis	Relations between infrastructure levels of importers, exporters and transit countries	He concludes that each of these infrastructure dimensions has a positive impact on bilateral trade.
Wilson et al. (2013)	Augmented gravity model	relationships in Asia-Pacific over the period 1989-2000 between trade facilitation, trade flows and GDP per person.	Improvements in the performance of logistics have shown significant trade growth..
Portugal-Perez and Wilson (2012)	Factor analysis	Aggregated 'soft' and 'hard' infrastructure indicators for developing countries' export performance between 2004 and 2007	The results suggest that both physical infrastructure and ICT have a notable effect on exports, in particular
Gani (2017)	Pearson coefficient correlation	logistics performance of different countries	The logistics performance has an important positive correlation with imports and exports.
Francois and Manchin (2007)	OLS, Heckman Selection, Tobit	logistics and export trade	A strong positive link between the performance of logistics and the export trade.
Hausman et al. (2013)	Pearson coefficient correlation	SEM and Pearson coefficient	The results show that there is a significant relationship btw import/export activities and logistic performance
Marti and Puertas (2017)	Gravity model	International trade logistics performance and trading costs	The result showed that logistics promote trade but also enhance the competitiveness of exports.
Munim and Schramm (2018)	SEM and multigraph SEM	Quality and performance of port infrastructure	The continued improvement in the quality of port infrastructure is vital for developing countries, as it contributes to a better logistics performance, leading to greater seaborne trade and greater economic growth. Port infrastructure can contribute to improving logistics, promote maritime trade and boost economic growth.
Lan et al. (2017)	SEM	Strict environmental rules and demand for goods and services	Higher charges lead to lower supplies for established companies.
Sánchez et al. (2013)	Pearson coefficient correlation	Port Effectiveness, Transport and Bilateral Trade Volume Relationship	Improving port efficiency can reduce transport costs and increase the volume of bilateral trade.
Uca et al. (2016)	Regression analysis	Logistics Performance Index and trade volume	The LPI's impact on trade volume is significant and positive, with a statistically significant moderating effect between the index on corruption perceptions and trade volume.
Zhenyu and Yaohua (2017)	Time series model,	Shandong Province GDP data, total import and export value, port cargo traffic and volume of traffic between 1995 and 2014	The empirical results show a long-term, stable co-integration, and the one-way cause is between the cargo volume, the volume of traffic and the total import and export amount.
Petra et al. (2020).	Pseudo-maximum probability estimator for the structural gravity model and Poisson	In the 2010–2018 period LPI and its sub-indices are the major independent variables of interest, with the main logistics on bilateral international trade between EU 15 and CEMS and the rest of the world	The results show that differences in LPI values have heterogeneous effects on bilateral trade, particularly if trading between different types of goods and different country pair groups is considered.
Host et al. (2019)	Cross-country data and gravity model	Logistics performance on international trade	The statistically significant and positive effect of logistics on trade flows is especially export performance
Jouili and Khemissi (2019)	Time series analysis	Six sub-dimensions of logistics performance on international seaborne trade.	The conclusions reveal a significant correlation between total logistical performance and six sub-dimensions in Tunisia and the seaborne business..

Table 1. Cont'd

Tarek et al (2017)	Panel data	Logistics performance indicator on trade openness	The results show that the logistics performance indicator does not affect African countries, which shows that the countries are moving toward logistics development and investment as a key part of trade.
Celbis, Nijkamp and Poot (2014)	Multiple regression	International trade and infrastructure (exports and imports)	According to the research, infrastructure IS important for international trade.
Kong (2010)	VAR model Time Series	International trade and international logistics	The findings demonstrated that China's growth of international logistics has had a major confident impact on international trade.
Hoekman and Nicita's (2010)	Gravity Model Pearson Coefficient	Trade LPI Index	The study discovered a substantial confident relationship between logistical performance and trade strength.
Lee and Lee (2012)	Factor analysis Pearson Coefficient	Data on international trade and logistics from 108 nations was examined.	It was discovered that six major elements impact the growth of international logistics on a national level, that are customs efficiency, infrastructure, international shipping, service quality, cargo tracking capability, and timeliness. There is a definite confident relationship between international logistics and trade.

Table 2. Graph analysis of articles used.

Methods	Panel data analysis	Pearson coefficient correlation	Regression analysis	Augmented gravity model	Factor analysis	OLS, Heckman Selection, Tobit	SEM and multigraph SEM	Time series model
Frequency	2	5	3	5	2	1	2	2
Percentage	9.1	22.7	13.6	22.7	9.1	4.5	9.1	9.1

performance and meet the demands of domestic and international logistics regulations that can improve their competitiveness and increase their export volumes.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interest.

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