Financial Diversification Analysis of Trade Integration: The Case of Iran and Its Trading Partners (ECO, D8 and Eurasian Countries)

Zahra Aghili[a], Reza Akbarian[b]*, Ahmad Sadraei Javaheri[a], Parviz Rostamzadeh[a]

a. Department of Economics, Shiraz University, Shiraz, Iran
b. Faculty of Economics, Kharazmi University, Tehran, Iran

Abstract

Academics and planners in the financial sector have researched the impact of financial development on commerce and trade integration in recent years due to its importance and interaction with other sectors, notably international trade. Thus, using 12 selected countries' data that are members of the Economic Cooperation Organization (ECO), Eurasia, and D8 during the period 1996-2020 and the augmented gravity model, this study examined the effect of financial tools like financial liberalization (FL) and open market operation (OMO) on trade integration between Iran and the selected countries. The index of financial liberalization positively and statistically significantly affects trade integration in the countries studied. Additionally, trade integration elasticity is +0.01 higher than OMO index. Economic magnitude is another independent determinant that boosts trade integration. In the analyzed countries, income convergence, population, real exchange rate, and geographical distance negatively impact trade integration. This study may be useful to policymakers and planners in ECO, Eurasia, and D8 nations, particularly Iran, in developing trade and financial sector development plans because trade integration can improve bilateral trade flows, economic growth, and social welfare.

Prior studies have measured commercial integration's impact. Financial development with open market and financial liberalization indicators affects trade integration in this study.

Highlights

- The investigation of the impact of financial development indicators on trade relations using the gravity model.
- Due to the significance of the effects of financial development indicators on trade flow and integration, the economies of member countries must increase financial openness and reform the banking system and interbank relations in order to strengthen trade relations and take additional steps toward trade integration.

1. Introduction

The expansion of international trade is due to the increased participation of national economies in the global economy over the past few decades. Today, in the international system of neighboring countries, there is a trend toward regional integration to enhance their trade capabilities, and no economy can thrive without export earnings, international trade, and increased interaction with its neighbors.

The proper development of financial markets lays the groundwork for stronger economic growth; consequently, markets and financial institutions reduce liquidity risk by developing suitable instruments, resulting in increased investment with higher returns. Additionally, diversification reduces investment risk within the financial system. Therefore, a financial system that mitigates risk through diversification fosters technological development and economic growth. In this context, eminent economists such as Hicks and Schumpeter emphasized financial development and viewed it as the engine and a crucial aspect of economic development. In fact, financial diversification fosters financial growth and subsequent economic expansion. Financial development plays a crucial role in the growth and investment processes. According to economists such as McKinnon & Shaw (1973), Hicks (1969), and Schumpeter (1911), there is a positive correlation between financial development and economic expansion. Therefore, financial development is acknowledged as one of the indicators that promote economic growth.

Important is the financial development through various financial instruments in the economic blocs, which, including the open market operation (OMO) mechanism, can be incorporated into the implementation of the financial development process in order to expand the external sector of the economy. Baldwin (1989) argues that financial markets are an important source of profit for countries with a competitive advantage in international trade. Expansion of economic ties necessitates a financial system based on the monetary and fiscal policies of all member nations. As one of the financial instruments, OMO can finance and coordinate interbank relations and manage the liquidity of industries with commercial potential, thereby facilitating their entrance into the business cycle. The country's central bank has the ability to manage money and liquidity effectively within the context of monetary policies, achieving its goals through the use of instruments such as OMO, modifying the legal reserve rate, and readjusting the rediscount rate (Haghighat & Gholipour, 2014).

Financial liberalization is an additional method of financial development that aims to achieve "financial development" and "financial deepening" and to prepare domestic financial markets for competition and participation in the event of mutual opening of domestic and foreign financial markets. Financial liberalization encompasses all components of the financial system, such as financial markets, financial institutions, and monetary, fiscal, and currency policies. However, there is no optimal method for adopting financial liberalization, and countries can

develop their own suitable model based on other economic factors (Dadgar & Nazari, 2009).

Classical theories demonstrate that financial liberalization results in optimal allocation of savings, greater diversification of investment risk, faster development, and fewer business cycles (McKinnon & Shaw, 1973). Since Iran's economy is on the path to globalization and must therefore be aligned with global financial markets, it is essential to investigate the effects of financial liberalization as one of the factors influencing financial development.

This study attempts to answer the following questions: What role does economic growth play in regional trade integration? As a financial development instrument for financial diversification, can financial liberalization and OMO direct liquidity in the interrelationships of regional financial markets, thereby expanding regional commercial relationships? In other words, are financial liberalization and OMO regarded as a mechanism for financial development to fund commerce in the region or commercial bloc, thereby fostering bilateral commercial contacts between nations within an economic (or geographical) region? Other factors such as income convergence (Linder theory) affect trade relations between regional blocs?

Material from the Economic Cooperation Organization (ECO), the D8 group, and the Eurasia Union was used to address the questions posed. In addition, the model used in this research is commercial gravity; thus, the novelty of this study lies in the design of the commercial gravity model based on theoretical and empirical considerations of the relationship between international trade and financial development in an economic bloc. Therefore, financial development is evaluated using two indicators, namely OMO and financial liberalization, and influential factors are investigated using the commercial gravity model.

The remainder of this paper is organized as follows. Section 2 reviews the research literature on this paper's topic. Section 3 discusses the research methodology and introduces the model, and Section 4 analyzes the research findings. The work is concluded in Section 5 with a discussion and some concluding remarks.

2. A Review of the Related Literature

One of the primary characteristics of the global economy is the trade integration of countries to identify new markets and facilitate commerce. In addition, the impact of the financial sector on the expansion of commerce as one of the key drivers of the growth and development of countries is a critical concern in the international economy. In recent years, economic policymakers in a number of nations have prioritized international trade for this reason. Numerous domestic and international studies have been conducted in order to investigate the commercial interactions between nations that constitute a commercial bloc.

Hur et al. examined the relationship between financial development, tangible assets, and international trade in a 2006 study. The findings indicated that countries with a significantly more developed financial sector had a comparative

advantage in industries with intangible assets. In industries constituted of tangible assets, countries with a lower level of financial development have an advantage. Kim et al. (2010) found evidence of positive effects of financial development on the trade of non-OECD[1] countries and insignificant effects of financial development on the trade of OECD nations in a study.

Kanani (2012) investigated the relationship between financial development, trade liberalization, and economic growth in Malawi. The findings revealed a long-term correlation between financial development, trade liberalization, and economic growth.

Levchenko et al. (2009) provide empirical evidence that expanding access to credit after financial liberalization increases firm entry, employment, and capital investment, and has a positive impact on economic development as a whole. Increasing access to export markets, according to Cho et al. (2019), generates a financial switching channel for gains from trade and enables firms to overcome high fixed costs of bond issuance to secure a reduced marginal cost of capital. Regional financial integration has a negative impact on the synchronization of regional business cycles, according to Gong & Kim (2018). On the basis of a study, Contessi & De Nicola (2012) investigate the influence of financial development on international trade and propose a roadmap for future empirical studies. The empirical literature suggests that finance plays an essential role in determining export participation at the extensive margin, but the results are weaker at the intensive margin. Jiang, in a 2020 study, examines the effect of financial development on service trade and argues how the financial development in Central and South America has affected the service trade of those countries.

In a study published in 2022, Afollabi demonstrates that Nigeria's economy is profoundly affected by the exchange rate and financial development and Countries with a stronger financial sector have a greater comparative advantage in production (Beck, 2002).

Ekanayake (2010) argues that there is a correlation between trade integration and trade diversion effects of regional trade agreements in various Asian regions. The study employs a gravity model to estimate the trade creation and trade diversion effects of various RTAs on intra-regional and inter-regional trade flows.

Doytchinova and Kravchenko (2019) analyze the use of the gravity model in policy research. They believe that a thorough analysis of the gravity model and its variables is essential for developing a sound and robust policy research. Gravity can provide a useful indicator of changes in trade flows associated with a given policy change, and the gravity model can be a useful instrument for applied trade policy researchers, according to this study. This model is able to characterize the behavior of trade flows in the context of policymaking and gravity modeling, which have a comparative advantage.

In Financial Integration and Economic Growth (2020), Ab-Rahim and Selvarajan examined the 1997-1998 Asian financial crisis as a catalyst for

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[1] Organization for European Economic Cooperation

cooperation between Asian countries and financial integration among countries with shared interests and risks. In light of this, the authors investigate the pre-crisis and post-crisis financial-growth nexus and examine the relationship between financial integration and development in Asian regions.

Among the internal studies, Tayebi (2006) analyzed the impact of trade integration on the flow of trade between Iran and selected blocs. The results indicated that trade integration between Iran and the European Union, the Persian Gulf countries, the D8 group, and the Southeast Asian countries generates commerce, with the European Union and the Union of Southeast Asian Nations being the most potent of these unions. Souri & Tashkini (2013) demonstrated in a paper examining the factors influencing trade between Iran and EU regional blocs that Iran's trade flow is founded on the Linder hypothesis that there is a positive relationship between mutual trade and the difference in revenues. Rasti & Rezaei (2013) analyzed the impact of financial development on the trade of World Trade Organization (WTO) member states. The results indicated that financial growth had a positive effect on the total trade of these countries but a negative effect on their service trade. Given that the positive impact of financial development on trade is roughly double its negative impact on the service trade of these nations, it has been recommended that the financial sector be bolstered and developed in order to improve economic and commercial performance. Zargar Talebi & Mojaveryian (2016) investigated the determinants of intraregional agricultural commodity trading intensity. According to the results of the gravity model, the variables of real bilateral exchange rate and degree of trade openness have a significant positive effect on the intensity of trade in agricultural products within the ECO region, whereas the variables of cross-sectional GDP[1] per capita and exchange rate fluctuations have a significant negative effect and distance has a nonsignificant negative effect on the intensity of bilateral trade. Furthermore, the increase in agricultural structure dissimilarity has a significant positive impact on the intensity of agricultural product trading within the ECO region. Additionally, the disparity in government support for the agricultural sector has a negative significant impact on the intensity of agricultural product trade within the ECO region.

According to the studies examined, commerce is vital to national vitality and economic growth. As most nations endeavor to increase economic growth through international trade, the growth of the financial sector is one of the primary variables that can aid in achieving this objective. A review of studies in the field of finance reveals that there are no studies that analyze the effects of OMO and financial liberalization on the development of trade in commercial regions simultaneously. Consequently, this subject is going to be investigated in this paper. According to the augmented gravity model of business, which investigates the relationship between financial development and the expansion of business relations, this study answers the question of whether the innovation of the model

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[1] Gross Domestic Product

through the use of OMO and financial liberalization variables has an impact on the evolution of trade in trade areas, thereby creating trade integration, and serves as a basis for policymaking in these areas. So that member states of the ECO, Eurasia, and D8 can employ the financial development model to implement trade integration programs.

3. Research Methodology

This descriptive analysis study employs a commercial gravity model's design and regression analysis to evaluate the research's hypotheses and answer its questions. Methodologically, the gravity model depicts the degree of gravity between two or more substances. Classical gravity theory in physics expresses the force of gravity a_{ij} between two materials i and j in proportion to their weight and inversely with the square of the distance d_{ij}^2 between these materials. Gravity models have been used to assess international trade flows, inspired by Newton's theory of gravity.

In the middle of the 19th century, H. Cary demonstrated the relevance of the theory of gravitation to social phenomena, and this theory was subsequently applied to analyze migration, consumer visits to department stores, road traffic, etc. Anderson (1979) identified and enhanced the gravity model's theoretical foundations. Tinbergen and Puyhonen were the first to apply the gravity model to the study of international trade flows. Since then, the gravity model has been recognized as a generic instrument in the field of international trade studies and has been successfully applied to all types of migrant flows, foreign direct investment, and trade flows. In the simplest case, when there are no barriers or incentives, bilateral trade flows can be modeled using Equation 1 as a direct function of the economic scale of the two countries and an inverse function of their geographical distance.

$$T_{ij} = f(GDP_i, GDP_j, D_{ij}) \tag{1}$$

Where the trade flow from country i to j is equal to T_{ij}.

GDP_i and GDP_j represent the economic scale of exporting and importing countries respectively, and D_{ij} represents the geographical distance between the two nations.

Logarithms are used to convert the multiplication form of the general specification of the gravitational equation into a linear form for estimation purposes. This equation can be expressed as Equation 2:

$$T_{ij} = C \frac{GDP_i.GDP_j}{D_{ij}^2} \tag{2}$$

Initially, these models were applied to cross-sectional data from multiple countries or time series data from a single country, resulting in many explicit and implicit constraints when attempting to specify a certain equation, as well as skewed results, as certain variables are neglected or essentially disregarded in such estimations. Also, heterogeneity between nations could not be considered. Using the panel data estimation method, the gravity model is estimated to address

these issues in recent years. This method allows for the evaluation of the heterogeneity and individual effects of countries, as well as the effects of time. The panel data technique improves the gravity regression model's efficacy and explanatory power.

According to the methodology examined in this section, the objectives of this study include evaluating the impact of financial liberalization, the role of OMO, and the impact of other factors on the trade integration of Iran and its trading partners in the ECO, the D8 group, and the Eurasia Union. This paper evaluates the statistical population of Iran's main trading partners in selected regional blocs, including the ECO (Iran, Pakistan, Turkey, and Azerbaijan), the D8 group (Bangladesh, Indonesia, Malaysia, and Nigeria), and the Eurasia Union (Russia, Kazakhstan, Tajikistan, and Belarus). These countries were chosen due to their proximity to Iran, their shared language and culture, and their history of commercial and economic cooperation with Iran.

3.1 Research Model

The gravity model is a typical paradigm for characterizing the business behavior of two partners (Kalbasi, 2001). In this regard, it is a useful tool for analyzing trade flows between two or more countries and offers the opportunity to explain bilateral trade flows within the context of economic integration and convergence. In addition, it provides an estimate of the bilateral trade potential at a given time and simultaneously from the exporting and importing countries' perspectives and explains the trade potential based on economic size, exports, imports, distance, and economic and cultural similarities.

In recent years, the evolution of the commercial gravity model has improved this model's performance in international trade literature. The specified form of the commercial gravity model trade addresses the trade flow between two countries i and j as a function of their income (y_i, y_j), population variables (N_i, N_j), distance (D_{ij}), and virtual variables (A_{ij}), as an explanation of proximity and trade arrangements and economic cultural cooperation contracts, as in Equation 3:

$$x_{ij} = \beta y_i^{\beta 1} . y_j^{\beta 2} . N_i^{\beta 3} . N_j^{\beta 4} . D_{ij}^{\beta 5} . A_{ij}^{\beta 6} . e^{\vartheta ij} \tag{3}$$

Where ϑij represents the error term (Zarzosu & Lehmann, 2003).

In another specification of the gravity model, per capita income in two countries i and j (yp) is substituted for population. The general form of this model is given by Equation 4:

$$x_{ij} = \gamma y_i^{\gamma 1} . y_j^{\gamma 2} . yp_i^{\gamma 3} . yp_j^{\gamma 4} . D_{ij}^{\gamma 5} . A_{ij}^{\gamma 6} . e^{\sigma ij} \tag{4}$$

The first model is frequently employed to estimate total exports, whereas the second is utilized to estimate bilateral exports for particular products (Zarzosu & Lehmann, 2003).

The relationship between trade integration in the studied commercial districts is a function of independent variables as shown in Equation 5:

$$TI_{ij} = f(GDP_i, GDP_j, POP_i, POP_j, DISC_{ij}, IG_{ij}, RER_{ijt}) \tag{5}$$

The specification Equation 6 is used to evaluate the model that adequately explains Iran's trade integration with other countries.

$$LTI_{ijt} = \beta_{ij} + \beta_1 L(GDP_{it}. GDP_{jt}) + \beta_2 L(POP_{it}. POP_{jt}) + \beta_3 LDISC_{ij} + \beta_4 LIG_{ijt} + \beta_5 LRER_{ijt} + U_{ijt} \qquad (6)$$

LTI_{ijt}: trade integration between country *i* and *j* at time *t*;

β_{ij}: individual effects that are specified for each business partner, so that $\beta_{ij} \neq \beta_{ji}$;

GDP_{it}: GDP of exporting country *i* at time *t*;

GDP_{jt}: GDP of importing country *j* at time *t*;

POP_{it}: population of exporting country *i* at time *t*;

POP_{jt}: population of importing country *j* at time *t*;

$DISC_{ij}$: distance between two trading partner countries;

IG_{ijt}: difference in per capita income of two trading partner countries;

RER_{ijt}: real currency exchange rate;

U_{ijt}: error term of the model, which has zero mean and specified variance in each time period.

To demonstrate the impact of financial development, which is expressed in this research paper with two variables, financial liberalization (FL) and open market operation (OMO), along with other independent variables affecting Iran's trade integration with selected countries (ECO, Eurasia, and D8), the gravity model is evaluated using Equation 7:

$$LTI_{ijt} = LTI_{ijt} = \beta_{ij} + \beta_1 L(GDP_{it}. GDP_{jt}) + \beta_2 L(POP_{it}. POP_{jt}) + \beta_3 LDISC_{ij} + \beta_4 LIG_{ijt} + \beta_5 LRER_{ijt} + \beta_6 LFL_{ijt} + \beta_7 LOMO_{ijt} + U_{ijt} \qquad (7)$$

The development of the financial sector is one of the significant factors that can play a crucial role in attaining the goals of rapid and sustained economic growth and the expansion of trade integration. countries can evaluate the viability of regional integration by analyzing the relationship between financial development and economic growth using well-known tools. In other words, they should determine if they can implement regional financial development using financial instruments and if they can achieve regional trade integration by examining regional financial development using financial instruments.

3.2 Explanation and Measurement of Model Variables

Trade integration: At the microeconomic level, interactions between trade, consumption, and production are used to identify the variable indicating trade integration. The trade integration connection is used to conclude the trade flow between the two countries (the value of exports and imports between the two countries). Numerous studies, including Anderson & Van Wincoop (2004) and Melitz & Ottaviano (2008), document the trade integration knowledge base. However, the following theoretical model is derived from Chen & Novy's (2011) research based on Anderson & Van Wincoop's (2004), research (Yazdani et al., 2020). Equation 8 illustrates the trade integration in reverse.

Utilizing the work of Yazdani et al. (2019) and a gravity-type econometric model, which is, of course, linearized, in an effort to identify the integration variable, consumption and production trade relations at the micro-economy level are utilized, and the integration relationship between two countries is determined using trade relations. The left side is the dependent variable integration variable (invers of θ_{ij}) and the right side is the explanatory variables of the gravity model, which are described below.

$$\theta_{ij} = \left(\frac{x_{ii}x_{jj}}{x_{ij}x_{ji}}\right)^{\frac{1}{2(\sigma-1)}} \tag{8}$$

Where θ_{ij} stands for inverse trade integration, x_{ii} represents the size of internal commerce in country i, x_{jj} represents the size of internal trade in country j, x_{ij} represents the trade flow from country i to country j, and x_{ji} represents the trade flow from country j to country i. σ is the substitution elasticity, which has a substantial impact on trade integration and is approximated by Equation 9:

$$\text{Ln}\left(\frac{D}{M}\right) = \alpha + \sigma \ln\left(\frac{P^m}{P^d}\right) + \varepsilon_t \tag{9}$$

Where D is the total demand, M is the total import, P^m is the import price index, and P^d is the consumer price index for each of the countries under investigation.

Economic size: Typically, the GDP variable is used to indicate a country's economic magnitude. In fact, the larger a nation's economy, the greater its supply and demand, as well as its trade volume with trading partners. In other words, the GDP positively influences bilateral trade flows. In this study, the variable $(GDP_{it}.GDP_{jt})$ was used to compute the multiplication of GDP_{it} and GDP_{jt}, so that GDP_{it} represents Iran's GDP during the study period.

This variable can imply market size based on the premise that higher populations will result in greater trade volumes. However, its sign is ambiguous because this variable influences both market size and economies of scale. In this investigation, the variable $(POP_{it}.POP_{jt})$ was computed by multiplying POP_{it} and POP_{jt}. Therefore, POP_{it} represents the Iranian population during the study period.

Geographic distance: Geographical location and geographical distance between partners are effective factors for convergence and commercial integration among nations. In the equation, the distance variable represents a portion of business expenses including transportation, insurance, susceptibility, and perishability. We aim to measure bilateral distances, both national and international, in a way that takes into account the geographical distribution of economic activities among nations. For this purpose, we consulted Mayer & Zigango's (2005) study. This approach did not regard a city's capital as its commercial hub. This is because, in certain countries, the industrial and city capitals are distinct. Thus, the population of the capital city or economic center of each country is factored into the calculation of the distance between two countries. Income convergence: It defines the difference in per capita income

between two trading partners and how it fluctuates in situations of income convergence or divergence. Helpman (1987) suggested the use of the income convergence index (IG_{ij}) for use in gravity modeling. Consequently, IG equals zero if two countries have the same per capita income, and any deviation from zero indicates the difference in per capita income. This index is calculated using Equation 10:

$$IG_{ijt} = \log (GDPPC_{it} - GDPPC_{jt})^2 \tag{10}$$

Where $GDPPC_{it}$ and $GDPPC_{jt}$ represent the per capita income of country *i* and country *j*, respectively, at time *t*.

Exchange rate: The exchange rate is a financial concept that evaluates the affordability of purchasing money. This factor can be used to compare the strength of various international countries. Thus, an increase in the exchange rate can enhance a country's ability to compete financially with other nations. The research demonstrates that the expansion of regional trade has an effect on the ultimate price of imported goods and results in trade integration. According to Linder, the exchange rate influences international commerce. Equation 11 determines the genuine exchange rate used in the research model:

$$RER_{ijt} = \frac{RER_{iust}}{RER_{just}} * \frac{\rho_{it}}{\rho_{jt}} \tag{11}$$

RER_{iust}: exchange rate of nominal currency of country *i* with the US dollar at time *t*;

RER_{just}: the exchange rate of the nominal currency of country *j* with the US dollar at time *t*;

$\frac{\rho_{it}}{\rho_{jt}}$: the ratio of the price level of country *i* to country *j*.

As long as economic theories foresee a direct relationship between currency depreciation and exports, the RER_{ijt} coefficient is anticipated to be positive.

Financial development: The business flow of business associates in a region is influenced by financing methods, the growth of capital flow, and their connections to global financial markets. This research model employs two financial liberalization (FL) indices and one OMO index.

The OMO index is measured by the ratio of bond sales to GDP, whereas the financial liberalization (FL) index is measured by the ratio of total banking and stock market resources to GDP; in fact, the effect of financial development is measured twice, once in the case of financial liberalization and once in the case of open market operation, in order to investigate the likelihood of creating regional trade integration by diversifying financial instruments.

The Eviews 10 software was used to estimate the model and cognitive evaluations. In addition, to regulate the heterogeneity of sections (trade partner countries), the specified model is estimated in a panel data environment, and experimental results are statistically and economically analyzed. From 1996 to 2020, the Islamic Republic of Iran Customs Administration (IRICA), the UN Comtrade Data Center (United Nations Commodity Trade Statistics Database), and the World Bank database provided the requisite statistics and data.

4. Research Findings

This section concentrates on the country's foreign trade status with the selected ECO member countries during the study period, which defines the import and export sectors of the country's commercial structure, according to IRICA data. The trends in Iran's commerce with ECO members are depicted in graphs 1 and 2. During this time period, Iran's exports to certain ECO member states have increased. However, this expansion has accelerated since 2009. By comparing Iran's exports with those of four selected ECO member states (Pakistan, Turkey, Azerbaijan, and Tajikistan), we can demonstrate that Iran's exports to Turkey are more valuable than those to the other four countries, such that in 2020, Iran's exports to Turkey, Pakistan, Azerbaijan, and Tajikistan had respective values of approximately $2,534, $1,014, $511, and $16 million. Since Turkey's imports from Iran follow a pattern virtually identical to Iran's imports from the rest of the world, it is more likely that economic ties will continue despite sanctions. Observing the trend of Iran's imports from the selected ECO member countries reveals that the value of Iran's imports from Turkey was also significant compared to Pakistan, Azerbaijan, and Tajikistan, such that in 2020, the values of Iran's imports from Turkey, Pakistan, Azerbaijan, and Tajikistan were approximately $4,399 million, $177 million, $76 million, and $7 million, respectively, and this trend has been accelerating since 2009. In addition, an analysis of Iran's trade relations with Pakistan and Azerbaijan reveals a nearly consistent pattern of exports and imports, and exports to these two countries have increased over the past several years.
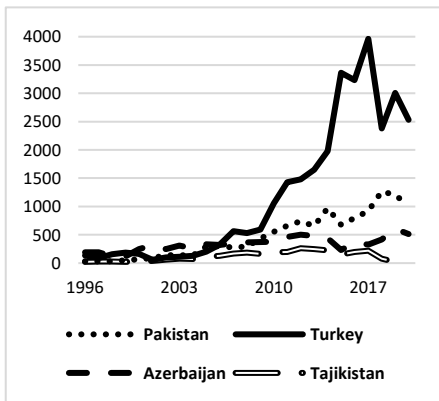

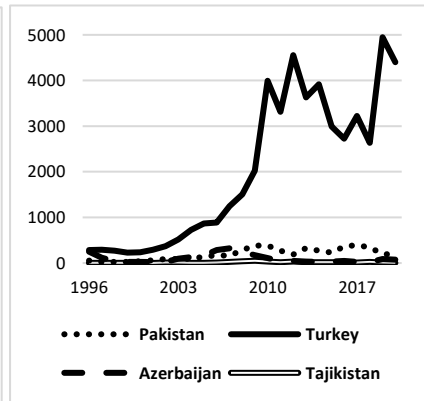**Chart 2: Iran's exports to the selected ECO member countries from 1996 to 2020 (million dollars)**

Chart 1: Iran's imports from the selected ECO member countries from 1996 to 2020 (million dollars)

Charts 3 and 4 depict the evolution of Iran's trade with D8 members. Comparing Iran's exports to four D8 member countries (Bangladesh, Indonesia, Malaysia, and Nigeria), one can observe that Iran's exports to Indonesia are of

greater value than those to the other three countries, with Iran's exports to Indonesia, Malaysia, Bangladesh, and Nigeria worth approximately 674, 99, 66, and 18 million dollars in 2020, respectively. Observing the trend of Iran's imports from the selected D8 member countries reveals that the value of Iran's imports from Malaysia was significantly higher than those from Indonesia, Bangladesh, and Nigeria, such that the values of Iran's imports from Malaysia, Indonesia, Bangladesh, and Nigeria in 2020 were approximately $288, $78, $40, and $0.28 million, respectively. Additionally, the investigation of Iran's trade exchanges with Nigeria and Bangladesh reveals a virtually consistent trend in terms of exports and imports, and Nigeria and Bangladesh have accounted for a smaller proportion of Iran's trade exchanges than the selected countries. Nevertheless, it is important to note that Iran's exports to Nigeria and Bangladesh have increased from approximately 0.14 and 5 million dollars in 1996 to approximately 18 and 66 million dollars in 2020, respectively.
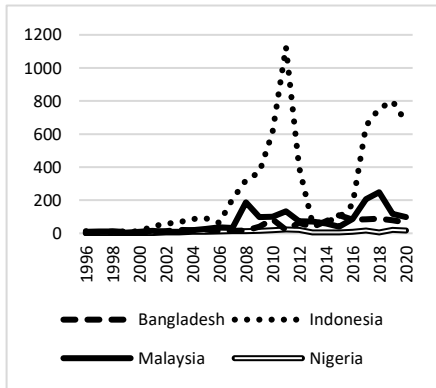

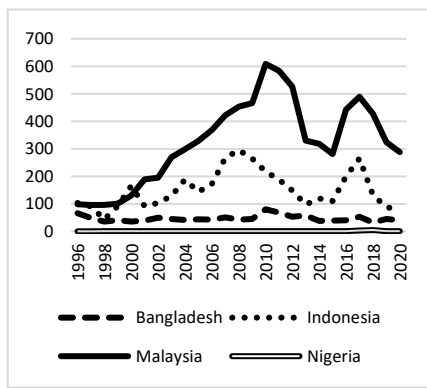**Chart 4: Iran's exports to selected D8 member countries during the years from 1996 to 2020 (million dollars)**

Chart 3: Iran's imports from the selected D8 member countries from 1996 to 2020 (million dollars)

Iran's trade with selected Eurasia member nations is depicted in Graphs 5 and 6. Comparing Iran's exports with those of three designated Eurasia member states (Russia, Kazakhstan, and Belarus) reveals that Russia is Iran's largest export market. In 2020, the value of Iran's exports to Russia, Kazakhstan, and Belarus was approximately 503, 168, and 21 million dollars, respectively. Moreover, the trend of Iran's imports from selected Eurasia member states indicates that the value of Iran's imports from Russia was significantly higher than those from Kazakhstan and Belarus, such that in 2020, Iran's imports from Russia, Kazakhstan, and Belarus were valued at approximately $1,070, $37, and $9 million, respectively. In addition, a glance at Iran's economic exchanges with Belarus reveals a largely stable export trend up until 2018, and in 2019 Iran's exports to Belarus increased by 795 percent, the highest increase among the

examined years. The value of imports from Belarus in 2020 was essentially equivalent to the value of imports from Belarus in 1996, despite the fact that imports from Belarus are declining.
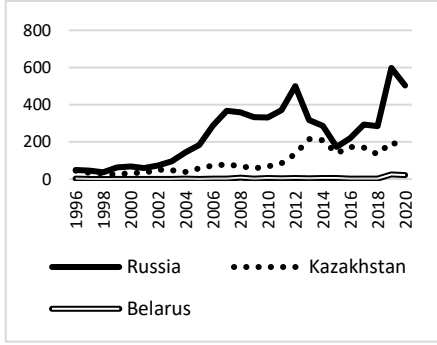

Chart 6: Iran's exports to the selected member countries of Eurasia from 1996 to 2020 (million dollars)
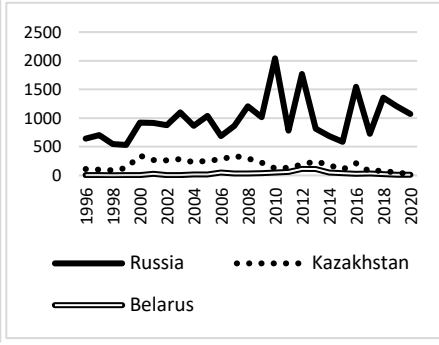
Chart 5: Iran's imports from the selected member countries of Eurasia from 1996 to 2020 (million dollars)

Nonstationarity of the variables causes spurious regressions, which renders the research results unreliable; therefore, it is necessary to test the normality of the study variables using the tests of Levin, Lin, & Chu (2002), Breitung (2000), Im, Pesaran, & Shin (2003), Fisher for augmented Dickey-Fuller test, and Fisher for Phillips-Perron test prior to making any estimates. Table 1 displays the results of the stationarity test for model variables.

Table 1. Results of the stationarity test of the variables under study

	Variable	Test	LLC	B t-stat	IPS	ADF–F	PP-F		LLC	B t-stat	IPS	ADF-F	PP-F
Test (variable level)	LTI	Statistic	-0.31	-0.08	-0.68	24.80	40.12	Test (with one time differencing)	-4.80	-6.86	-7.51	92.64	489.77
		Prob	0.38	0.47	0.25	0.31	0.01		0.00	0.00	0.00	0.00	0.00
	LFLr	Statistic	-1.57	1.04	-0.33	21.56	39.57		-12.77	-3.63	-9.85	124.18	136.38
		Prob	0.06	0.85	0.37	0.49	0.01		0.00	0.00	0.00	0.00	0.00
	LGDP	Statistic	6.14	4.47	7.28	0.33	0.29		-11.22	-10.42	-12.27	149.45	1612.94
		Prob	1.00	1.00	1.00	1.00	1.00		0.00	0.00	0.00	0.00	0.00
	LIG	Statistic	4.58	4.82	2.77	26.51	41.27		-3.67	-15.91	-7.04	113.98	209.02
		Prob	1.00	1.00	1.00	0.23	0.01		0.00	0.00	0.00	0.00	0.00

LOMOr	Statistic	-1.28	0.01	-2.82	52.94	107.00		-13.00	-4.89	-13.70	188.78	2201.72
	Prob	0.10	0.50	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
LPOP	Statistic	-15.29	6.20	-13.86	195.18	88.84		-6.93	-15.91	-4.17	62.57	17.00
	Prob	0.00	1.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
LRER	Statistic	-0.38	-2.16	1.55	15.03	18.34		-3.63	-6.38	-4.17	53.48	123.86
	prob	0.35	1.00	0.94	0.86	0.69		0.00	0.00	0.00	0.00	0.00
LDIST	Statistic	-3.21	-0.11	-2.46	39.44	17.24		-3.49	-4.58	-4.70	60.57	49.11
	prob	0.00	0.46	0.01	0.01	0.75		0.00	0.00	0.00	0.00	0.00

Source: Research findings

This table contains figures displaying the t-statistic and P-value. According to the results of the preceding table, all of the model's fundamental variables are non-stationary; however, after one differentiation, they all become stationary. In other words, they are cointegrated variables of the first order. Consequently, cointegration tests are required. Cointegration analysis is based on the premise that although many economic time series are nonstationary (with random trends), they may be stationary (and free of random trends) in the long-term linear combination of these variables. It should be noted that the cointegration test is used when all data are cointegrated at zero or first order. Using Pedroni's (1995 and 1999) method, the cointegration test with panel data is frequently conducted. The results of the Pedroni cointegration test are presented in Table 2.

Table 2. Results of Pedroni's cointegration test

Panel and group statistics	With y-intercept		With y-intercept and trend	
	Statistic	Prob	Statistic	Prob
Panel v-Statistic	-1.77	0.96	-2.91	1.00
Panel rho-Statistic	1.38	0.92	2.15	0.98
Panel PP-Statistic	-3.58	0.00	-4.40	0.00
Panel ADF-Statistic	-3.23	0.00	-3.28	0.00
Group rho-Statistic	2.64	1.00	3.21	1.00
Group PP-Statistic	-4.38	0.00	-4.97	0.00
Group ADF-Statistic	-2.86	0.00	-2.86	0.00

Source: Research findings

Based on the results of the cointegration analyses, the null hypothesis that there is no cointegration between the dependent variable and the explanatory variables has been rejected. Thus, the model has verified the long-term relationship between trade integration and other variables. Therefore, the model can be estimated without regard to spurious regression.

In this research, the model is estimated via the panel data method. According to the panel data econometric literature, it is necessary to evaluate the homogeneity of the data using the F-test statistic prior to estimating the model using the panel data estimation method. The F-test indicates that the use of the panel model to aggregate data is significant. The results of the F-limer test are shown in Table 3.

Table 3. Results of F-limer test

Redundant fixed effects tests - F-limer			
Effects test	Statistic	d.f.	Prob
Cross-section F	268.36	(+10.257)	0.00
Cross-section chi-square	670.25	10.00	0.00

Source: *Research findings*

The panel data model was chosen for this research based on the findings of Table 3. The Hausman test statistic should be used to determine which of the methods with fixed and random effects is most suitable for estimation. When estimating a model, the results of the Hausman test to determine the optimal estimation method indicate that the approach with fixed effects is preferable to the method with random effects. Table 4 presents the results of the tests.

Table 4. Hausman test results for choosing the fixed- or random-effects model

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq / Statistic	Chi-Sq / d.f.	Prob
Cross-section random	43.14	7.00	0.00

Source: *Research findings*

As observed, the results of the Hausman test indicate that the fixed effects method is the most suitable approach for estimating models with panel data. The initial estimated model had issues with heterogeneity of variance and autocorrelation; therefore, the model will be re-estimated using the practical generalized least squares (GLS) method in order to produce more effective results. The assumption of normality of the error term, on the other hand, is one of the traditional assumptions considered in regression analysis. Following the resolution of the model's issues, Table 5 details the final model's specifications.

Table 5. Results of estimating the gravity model via the fixed effects model

Explanatory variables and Y-intercept	Coefficients	Standard error	T-statistic	P-value
C	138.88	7.44	18.68	0.00
LFL	0.22	0.06	3.50	0.00
LOMO	0.01	0.00	2.47	0.01
LGDP	0.34	0.03	10.78	0.00
LIG	-0.38	0.17	-2.19	0.03
LPOP	-3.89	0.23	17.24	0.00
LRER	-0.10	0.01	-6.83	0.00
LDIST	-0.89	0.06	-14.02	0.00
=0.97 $\overline{R}^2$= 0.96 F-statistic=505.5 Prob=0.00 D.W=2.09 Jarque-Bera=0.69 R^2 Prob=0.7				

Source: Research findings

Table 5 demonstrates that the estimated model has a good fit, and the basic criteria for accepting the regression, including the adjusted coefficient of determination, the expected sign of the coefficients, the significance of the individual coefficients, and the regression as a whole, all indicate the regression's goodness of fit. The outcomes can therefore serve as the basis for economic analysis. The obtained results indicate that the financial liberalization index, which is derived from the ratio of total bank resources and stock market to GDP, has a positive and statistically significant impact on the degree of trade integration among the examined countries. In other words, an increase of 1% in the financial liberalization index leads to an increase of 0.22% in trade integration. In contrast, the elasticity of trade integration relative to the OMO index, which is derived from the ratio of bond sales to GDP, is 0.01. This indicates that a 1% increase in the OMO index results in an increase of 0.10 percentage points in the degree of trade integration. Moreover, the data indicate that economic size has a positive and statistically significant effect on the degree of trade integration, such that the degree of trade integration increases by 0.34% for every one percent increase in economic size. The elasticity of trade integration relative to income integration is -0.38, indicating that the degree of integration reduces by 0.34% for every 1% increase in the income differential between countries. In other words, commerce integration is greater among countries with comparable incomes and proximity. On the other hand, population has a negative significant effect on the level of trade integration between the examined countries. To put in another words, the degree of commercial integration drops by 3.89% for every 1% rise in a country's

population. In addition, the gravity model's estimation results indicate that the degree of trade integration decreases by 0.1% for each 1% increase in the real exchange rate. That is, an increase in the exchange rate increases the cost of commercial products, thereby reducing trade and trade integration. In conclusion, the trade integration elasticity with respect to geographical distance is -0.89, indicating that with a 1% increase in the geographical distance between countries, the degree of trade integration between them decreases by 0.89%, which is consistent with the theoretical foundations and previous studies.

5. Discussion and Conclusion

Financial development and trade integration in ECO, Eurasia, and D8 member states nations were the study's main focus. Thus, the study of financial development in trade integration used a commercial gravity model and econometric panel data from 12 selected member nations from 1996 to 2020First, the model's dependent variable, the degree of trade integration, was assigned and evaluated using the method of Chen & Novy (2011) and the research of Anderson & Van Wincoop (1979). Calculations were performed on the independent variables of the commercial gravity model, which include the financial liberalization index (the ratio of total bank resources and the stock market to GDP), the OMO index (the ratio of bond sales to GDP), economic size, income convergence, population, real exchange rate, and geographical distance. The fixed effect model was chosen for the variables of the commercial gravity model based on the F-limer and Hausman tests. The results indicate that the index of financial liberalization has a positive and statistically significant effect on the level of trade integration of the countries under investigation. Additionally, the elasticity of trade integration is greater than 0.01 and positive. Economic magnitude is another independent variable that positively influences the degree of trade integration. Trade integration among the analyzed nations is significantly impacted negatively by convergence of income, population, real exchange rate, and geographic distance.

Compared to the other two regions, the degree of Iran's integration with the selected Eurasia member states has decreased over the study period, and this situation should be avoided at all costs. The significant positive effect of the financial liberalization index on trade integration of the countries analyzed suggests that removing legal and administrative restrictions on capital movement can help integrate the global financial system. Given that some recent events can be attributed to US unilateral sanctions, it is necessary to take more serious steps to resolve and improve this matter to maximize financial liberalization opportunities. In addition, the results indicate that the elasticity of trade integration relative to the OMO index is +0.01, whereas the elasticity of trade integration relative to the financial liberalization index is 0.22. The financial development as measured by the financial liberalization index will have a greater impact on the integration of countries than the OMO index, according to these findings. Therefore, it is necessary to open the economic doors to these countries

by reducing tariffs, averting frequent changes in economic laws and policies, and integrating finance and trade for a more stable status in economic relations. According to the studies conducted in the financial field, there are no studies that discuss the effects of financial development, including open market operations and financial liberalization, alongside the development of trade in commercial areas, and the present study has investigated this topic. The coefficient of the product of Iran's and its trading partners' GDP, a proxy for economic size, is consistent with theoretical assumptions and demonstrates that economic size has a direct effect on bilateral trade. In other words, the larger the size and production capacity of an economy, the greater the output that can be produced at a reduced cost, and the greater its comparative advantage on international markets. This will enhance Iran's exports. On the other hand, this issue enables the domestic market to attract foreign goods, resulting in an increase in the country's foreign trade. Therefore, developing appropriate platforms for increasing the GDP can be advantageous for expanding mutual relations, such as boosting local production and attracting domestic and foreign investments.

The results demonstrated that geographical distance negatively impacts trade integration between countries. Geographic distance is crucial to Iran's economic interactions with its partners since transportation costs hinder economic and commercial cooperation. Given this and the sign of the variable coefficient of geographical distance, Iran can strengthen trade ties with its neighbors.

The following are our suggestions:

1. Creating integration in trade relations and economic convergence is an essential objective of regional economic development. So, it is necessary to employ the appropriate economic and political instruments to accomplish these objectives in the studied inventions such as Eurasia and Eco. Due to the importance of financial development indicators on trade flow and integration, it is necessary for the economies of member countries to increase financial openness and reform the banking system and interbank relations in order to strengthen trade relations and take additional steps toward trade integration.

2. Financial liberalization as a result of an increase in the proportion of financial resources to GDP, such as the growth of bank deposits from people's savings, which has the ability to invest, is a favorable financial policy for providing financial resources for tradable products in the countries of the region and fostering the development of their commercial relations.

3. Open market operations in the form of bond sales in the banking system can direct the flow of interbank liquidity to provide financial resources for the external sector of the economy, assuming efficient and integrated management in the member countries.

4. The impact of financial development indicators on trade relations, which is one of the findings of this study, necessitates convergence in financial and monetary policies, making a direction decision in common financial policies, and having the commitment and executive guarantee of these policies by the Eurasian Union and ECO member states.

According to the calculations, Iran's integration (removal of obstacles) in the selected Eurasia member states has declined relative to the other two regions over the past decade, and it is recommended that the continuation of this trend be placed on the agenda.

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