Journal of Social Research

P-ISSN:2827-9832
E-ISSN: 2828-335x
Vol. 5, No. 9, August 2026
http://ijsr.internationaljournallabs.com/index.php/ijsr

Determinants of International Trade in The Muslim Developing Countries of The D-8 (Developing Eight Countries)

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Keywords:
International Trade; GDP; Exchange Rate; Inflation; Labor Force Participation Rate; Individuals using The Internet; Government Effectiveness Index

ABSTRACT

Global economic integration has increased the importance of international trade for developing countries; however, trade performance among the Developing Eight (D-8) countries remains uneven and volatile. This study aims to examine the determinants of international trade in D-8 Muslim developing countries by assessing the roles of exchange rates, inflation, labor force participation, internet use, and government effectiveness. A quantitative descriptive research design was employed using panel data from seven D-8 member countries—Bangladesh, Egypt, Indonesia, Iran, Malaysia, Pakistan, and Turkey—covering the period from 2009 to 2023. Data were obtained from the World Bank and analyzed using panel data regression with EViews 13. The results show that exchange rates, inflation, and government effectiveness have positive and statistically significant effects on international trade, while labor force participation has a positive but statistically insignificant effect, and internet use has a negative but statistically insignificant effect. Collectively, the independent variables significantly explain variations in international trade, with an R-squared value of 0.7432. These findings indicate that macroeconomic stability and effective institutions are key drivers of trade performance, whereas labor availability and internet penetration alone are insufficient to strengthen trade outcomes. The study concludes that D-8 countries should reinforce institutional quality, maintain macroeconomic stability, and improve workforce capabilities and technological capacity to enhance international trade competitiveness in global markets.

INTRODUCTION

The development of globalization has transformed the world economic system into an increasingly integrated structure, creating a new landscape characterized by diverse economic dynamics. International trade, as a manifestation of global integration, is widely regarded as an effective mechanism for promoting development and addressing socioeconomic challenges such as inequality and unemployment. International trade is considered one of the most important pillars of the global economy (Korah, 2016); notably, trade generates multiplier effects because it involves economic, political, social, and environmental dimensions. Over the past few decades, international trade has been recognized for its significant contribution to economic growth (Yousefi et al., 2020). Trade is often described as an engine of economic growth (Salvatore, 2004). Classical economists argued that the primary objective of trade was to achieve maximum material welfare and

wealth accumulation; however, increasing inequality between developed and developing countries has disrupted economic activities and transactions (Wau et al., 2021).

Globalization has influenced structural transformations involving trade, capital flows, labor migration, technology, and information exchange (Lee, 2019), thereby forming cross-country economic relationships that facilitate trade interactions (Benczes, 2014). From an economic perspective, the role of international trade is reflected in the way exports and imports between countries stimulate industrialization, transportation development, and the expansion of multinational corporations as part of the globalization process. The tangible benefits derived from international trade include increased national income, foreign exchange reserves, asset exchange, and expanded labor demand (Siregar & Soemitra, 2023). The direct and indirect effects of international trade demonstrate a strong relationship with development, as trade influences a country's economic growth structure and income distribution (Todaro & Smith, 2012).

International trade has become a fundamental institution in the global economic system (Amelia, 2018). Its theories and practices continue to evolve; the modern trade theory developed by Heckscher and Ohlin in the twentieth century emphasized that international trade can generally improve welfare, although the benefits received by participating countries may differ. These differences depend on the availability of production factors, whether abundant or scarce, within each country amid intense global competition (Assiddiq, 2019). In the contemporary twenty-first century, more simplified and realistic trade models have emerged by incorporating political strategies, macroeconomic perspectives, and issues such as inequality into international trade theory (Bharat et al., 2023).

Trade issues have attracted the attention of international organizations such as the World Trade Organization (WTO), which originated from the General Agreement on Tariffs and Trade (GATT) and established international tariff and trade agreements. This development represented a significant turning point in global economic, political, and commercial relations (Goldberg & Reed, 2023; Lenton et al., 2025; O'brien & Williams, 2025). The International Monetary Fund (IMF), which focuses on international financial stability, was established to address financial aspects of global economic cooperation among countries. Meanwhile, the World Bank provides policy guidance, particularly for developing countries, to support transitions toward more open economic systems (Tahir et al., 2023). The establishment of the WTO, as stated in the preamble of its founding agreement, aims to create fair trading conditions and eliminate discriminatory treatment in international commerce (Role et al., 2008).

International integration, which has emerged as a consequence of globalization, provides both opportunities and challenges for countries worldwide. International trade is considered a mechanism through which developing countries can accelerate economic progress by reducing productivity gaps (Omoke & Charles, 2021). However, countries with limited production factors often face greater competitive pressures (Estetika et al., 2022). Competing independently in global markets remains a considerable challenge for developing countries. In response to these conditions, a regional economic organization known as the Developing Eight (D-8) was established, with the expectation of promoting economic transformation among its member countries.

Several fundamental considerations subsequently encouraged developing countries to adopt more open economic systems characterized by increased international trade activities. Global trade, represented by exports and imports, contributes to economic development (Reddy, 2020); many developing countries have benefited from broader market access and enhanced competitiveness (Tahir & Hayat, 2020). The role of export growth has become a central theme in economic growth theories over recent decades (Atasoy, 2020). Increases in per capita income, inflation, and the appreciation of partner countries' currencies against the U.S. dollar (USD) can stimulate demand for Indonesian exports within the ASEAN region, although the effects vary across countries (Wau, 2023). The positive impacts of trade, including increased industrialization and labor demand, have encouraged developing countries to participate in international trade as a means of improving economic performance and development outcomes. The implementation of international trade activities in D-8 countries can be examined through export and import indicators.

The chart above illustrates that export and import growth trends among D-8 countries are relatively volatile. Countries experiencing trade surpluses (where exports exceed imports) include Indonesia, Iran, Malaysia, and Turkey, whereas countries experiencing trade deficits include Bangladesh, Egypt, and Pakistan. A substantial gap exists between the country with the highest export value, Turkey, at US$315 billion, and the country with the lowest export value, Pakistan, at US$44 billion. Such fluctuations and disparities are influenced by various factors, including country-specific characteristics, demographic conditions, macroeconomic stability, and institutional quality. The limited trade performance of the D-8 organization may be associated with several factors, including the role of domestic institutions in shaping international economic relations and the unstable and inconsistent economic conditions of D-8 member countries.

The contradictory empirical findings reported in previous studies, combined with the limited research specifically examining the determinants of trade openness, particularly within predominantly Muslim developing countries represented by the Developing Eight (D-8), highlight the importance of this research. This study examines the determinants of international trade from a broader perspective by considering the role of macroeconomic stability in promoting trade activities, as well as the contribution of multinational corporations in creating opportunities for foreign investment and employment generation. The substantial contribution of trade to improving the economies of developing countries should be emphasized; however, the relatively low trade values among D-8 countries indicate that international trade performance within these countries has not yet reached its optimal potential. This study contributes a methodological improvement through the application of a comprehensive technology-component matrix to examine its relationship with international trade.

This investigation focuses on macroeconomic variables, including exchange rates, inflation, labor force participation, and technology, while also revisiting the relationship between labor force participation and trade openness in developing countries. Based on the background presented above, this study aims to examine the research topic entitled "Determinants of International Trade in the Developing Eight Muslim Countries (D-8)."

METHOD

Research Design

This study employed a quantitative descriptive approach to examine the effects of exchange rates, inflation, labor force, technology, and institutional factors on international trade. Panel data regression analysis was conducted using EViews 13 to analyze the relationship between the variables.

The study consisted of one dependent variable, namely international trade (Y), and five independent variables: exchange rate (X1), inflation (X2), labor force (X3), technology (individuals using the internet) (X4), and institutional quality (X5). The operational definitions of these variables are presented in Table 1.

Table 1. Operational Definition of Research Variables

Variable	Symbol	Measurement	Source
International Trade	T	Exports + Imports / GDP (%)	World Bank
Exchange Rate	ER	Official Exchange Rate, LCU per US$, Period Average, Ratio	World Bank
Inflation	INF	(% CPI)	World Bank
Labor Force	LBR	Labor Force Participation Rate, Total	World Bank
Technology	IUI	Individuals Using the Internet, Total %	World Bank
Institution	GE	Government Effectiveness, Index	World Bank

The sample was selected using a purposive sampling technique, in which sampling is based solely on criteria relevant to the research objectives. The sampling criteria applied in this study were: (a) the country is a member of the Developing Eight Countries (D-8); and (b) the country has complete data availability for the variables used in this study. Based on these criteria, seven countries were selected, namely Bangladesh, Egypt, Indonesia, Iran, Malaysia, Pakistan, and Turkey.

The population refers to the entire set of objects covered by a study (Sekaran & Bougie, 2017). The population of this study comprises all eight developing countries that are members of the Developing Eight Countries (D-8).

Multiple regression analysis is a statistical method used to examine the form and strength of the relationship between one dependent variable and more than one independent variable. This test was conducted to determine whether there is a significant effect of the independent variables—Exchange Rate (X1), Inflation (X2), Labor Force (X3), Technology (X4), and Institution (X5)—on the dependent variable, Trade Openness (Y). The analysis employed the following equation:

$$Tit = \alpha + \beta 1ERit + \beta 2INFit + \beta 3LBRit + \beta 4IUIit + \beta 5GEit + \beta 6FTSit + eit$$

Where: T = Trade (International Trade); i = Cross Section; t = Time Series; α = Constant; β1–β5 = Regression Coefficients; ER = Exchange Rate; INF = Inflation; LBR = Labor (Labor Force); IUI = Individuals Using the Internet (Technology); GE = Government Effectiveness (Institutional Quality); e = Error term.

Panel Data Regression Model Selection

This study employs panel data regression using data from seven D-8 member countries over the period 2009–2023. In the initial stage of estimation, the researcher first conducted a model selection test to determine the most appropriate model for analyzing the data. The results of this test are presented in Table 2.

Table 2. Results of the Chow, Hausman, and Lagrange Multiplier Tests

Description	Effect Test	Statistic	Prob.
Chow Test (FEM)	Cross-Section F	5.230213	0.0001
Hausman Test (REM)	Cross Section Random	3.250922	0.6614
LM Test (REM)	Both	22.41215	0.0000

Source: Processed using Eviews 13, 2025.

Based on the model selection tests conducted to determine the most appropriate approach among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM), the resulting equation is written as follows:

$$\text{Trade (T)} = 5317.201 + 0.000236\ \text{ERit} + 66.83453\ \text{INFit} + 0.018199\ \text{LBRit} + (-0.000435)\ \text{IUIit} + 5731.263\ \text{GEit} + e$$

Panel Data Regression Analysis

Based on the selected model, the panel data regression results are presented in Table 3.

Table 3. Panel Data Regression Results

Description	Coefficient	T-Statistic	Prob.	Interpretation
C	5317.201	3.173622	0.0020	
Exchange Rate (Official Exchange Rate)	0.000236	3.777152	0.0003	Positive Effect
Inflation (% CPI)	66.83453	3.576598	0.0005	Positive Effect
Labor Force (Labor Force Participation Rate, Total)	0.018199	0.065332	0.9480	Positive Effect
Technology (Individuals Using the Internet, Total %)	-0.000435	-0.664067	0.5082	Negative Effect
Institution (Government Effectiveness, Index)	5731.263	13.52695	0.0000	Positive Effect
Prob (F-Statistic)	0.000000	0.000000	0.000000	
R-Square	0.743175	0.743175	0.743175	
Adj. R^2	0.730205	0.730205	0.730205	

Source: Processed using Eviews 13, 2025.

Hypothesis Testing

Hypothesis testing was also conducted to determine the extent to which the independent variables are able to explain the dependent variable. This testing consisted of three stages, namely the coefficient of determination test, the simultaneous test (F-test), and the partial test (t-test), the results of which are presented and discussed below.

Coefficient of Determination Test (R^2)

As shown in Table 3, the R-Square value of 0.743175 indicates that the independent variables—Exchange Rate (X1), Inflation (X2), Labor Force (X3), Technology (X4), and Government Effectiveness (X5)—are able to explain 74.31% of the variation in the dependent variable, International Trade, while the remaining 25.69% is explained by other factors outside the model that were not included in this study.

Simultaneous Test (F-Test)

As shown in Table 3, the probability value of the F-statistic is 0.000000, which is smaller than the 5% significance level. This result indicates that, taken together, the independent variables used in this study—Exchange Rate (X1), Inflation (X2), Labor Force (X3), Technology (X4), and Government Effectiveness (X5)—have a simultaneous effect on the dependent variable, International Trade (Y).

Partial Test (t-Test)

The partial test results show that the Exchange Rate variable has a probability value of 0.0003, which is smaller than 0.05, with a positive coefficient of 0.000236, indicating that the exchange rate has a significant effect on international trade among D-8 member countries. The Inflation variable has a probability value of 0.0005, which is smaller than 0.05, with a positive coefficient of 66.83453, indicating that inflation has a significant effect on international trade among D-8 member countries. The Labor Force variable has a probability value of 0.0948, which is greater than 0.05, with a positive coefficient of 0.018199, indicating that the labor force has no significant effect on international trade among D-8 member countries. The Technology (Individuals Using the Internet) variable has a probability value of 0.5082, which is greater than 0.05, with a negative coefficient of –0.000435, indicating that technology has no significant effect on international trade among D-8 member countries at the 5% significance level, although it does show a negative effect at the 10% significance level. Finally, the Government Effectiveness variable has a probability value of 0.0000, which is smaller than 0.05, with a positive coefficient of 5731.263, indicating that government effectiveness has a positive and significant effect on international trade among D-8 member countries.

RESULTS AND DISCUSSION

Effect of Exchange Rate on International Trade in D-8 Member Countries

Based on the panel data regression results, the exchange rate variable produced a t-statistic value of 3.777152, indicating that the exchange rate has a positive and significant effect on international trade in D-8 member countries. This finding is consistent with Purchasing Power Parity (PPP) theory, which explains that the relationship between exchange rates and international trade tends toward equilibrium when a rise in the exchange rate increases purchasing power. The positive relationship indicates that any increase in the exchange rate is followed by an increase in the value of international trade, in line with the Theory of Comparative Advantage, which holds that a country will export commodities it can produce at a relatively lower cost and import commodities whose production costs are comparatively higher. This strategy enables more efficient trade realization and supports exchange rate appreciation. Purchasing Power Parity theory, first proposed by the Swedish economist Gustav Cassel, explains that the exchange rate between two countries reflects the

difference in price levels between them: a country whose currency depreciates will find that its goods and services become more expensive for other countries, and vice versa.

Effect of Inflation on International Trade in D-8 Member Countries

Based on the panel data regression results, the inflation variable produced a t-statistic value of 3.576598, indicating that inflation has a positive and significant effect on international trade in D-8 member countries. Purchasing Power Parity theory suggests that a country's exchange rate is influenced by its inflation rate: when domestic inflation rises, the exchange rate tends to depreciate, and the resulting decline in the value of the domestic currency relative to foreign currencies makes export goods cheaper, thereby increasing exports. This positive relationship indicates that as the inflation rate rises, trade activity tends to increase as well. However, this positive effect warrants further scrutiny to determine whether it reflects successful monetary policy in controlling inflation or a particular response of the domestic economy. The inflation rate affects export competitiveness, currency value, and the price of traded goods, underscoring the importance of inflation control in preventing hyperinflation, which can erode purchasing power, raise production costs, and destabilize the economy in ways that ultimately harm trade. Stable inflation therefore plays an important role in stimulating international trade through its influence on prices, competitiveness, exchange rates, and overall economic stability.

Effect of Labor Force on International Trade in D-8 Member Countries

With a probability value of 0.9480, greater than the 5% significance level, the labor force variable was found to have no significant effect on international trade. This result is inconsistent with the Heckscher-Ohlin (H-O) theory, suggesting that a large labor force in developing countries does not always translate into a significant effect on trade. This may be explained by several factors, including continued reliance on cheap labor, exports that are not labor-intensive, and inadequate infrastructure to support international trade. The Heckscher-Ohlin theory holds that a country will export goods that make intensive use of its abundant production factors and import goods that rely on factors that are relatively scarce; a large population and abundant labor force would therefore be expected to constitute a production advantage, particularly in labor-intensive industries such as manufacturing in open economies. Fei and Ranis (1961) examined the characteristics of labor in the context of developing economies, noting that underdeveloped natural resources often push a large share of the population into the agricultural sector, while Mankiw (1992) classified labor into skilled and unskilled categories. Trade liberalization reforms are generally intended to promote exports and imports, with labor serving as one of the key factors supporting production activity; in practice, however, the size of the labor force does not always translate into a positive effect on international trade. Developing countries face various dynamic challenges, including sectors that are less dependent on labor due to technological substitution, as well as persistent imbalances in the distribution of skilled and unskilled labor.

Effect of Technology (Individuals Using the Internet) on International Trade in D-8 Member Countries

Based on the panel data regression results, the Individuals Using the Internet variable produced a t-statistic value of -0.664067, indicating that this technology variable has a negative effect on international trade in D-8 member countries. This result is inconsistent with the assumptions of the Heckscher-Ohlin theory and the Theory of Comparative Advantage, both of which suggest that technology should enhance trade. Case studies in developing countries show that challenges such as differing regulations across countries, cyber threats, unequal access to technology, and protectionist policies in developed countries prevent technology from having a significant positive impact on trade. Adaptive policymaking in developing countries is therefore needed to improve technological quality and support more inclusive international trade (Rusmiati et al., 2025). In the context of international trade, digitalization offers opportunities for innovation and efficiency, allowing developing countries to improve their production and distribution processes through the use of technology. Integrating technology into trade policy is essential for revolutionizing national economies, as technological progress can drive sustainable economic growth. The technology gap between developed and developing countries, as described in the Technology Gap Theory proposed by Michael Posner, explains that developed countries hold an advantage in exporting certain products, while developing countries that continue to lag in technological progress experience a decline in trade value. This technological lag also contributes to the inability of developing countries to compete effectively in the global market.

Effect of Government Effectiveness on International Trade

Based on the panel data regression results, the Government Effectiveness variable produced a t-statistic value of 13.52695, indicating that government effectiveness has a positive and significant effect on international trade in D-8 member countries. This result is consistent with Good Governance Theory, which encompasses Government Effectiveness, Rule of Law, and Control of Corruption. A well-functioning and efficient government system enables the creation of a more conducive trade environment through the formulation of more profitable trade policies and the provision of infrastructure that supports international trade. Open economic systems expose participating countries to greater international trade activity, which in turn carries risks associated with global economic uncertainty. In this context, institutions play an important role in stabilizing the economy through monetary and other economic policies as a core function of the state. The primary objective of monetary policy is to maintain exchange rate stability and growth that positively influences foreign investment, foreign trade, unemployment, and GDP (Najafi et al., 2024). Monetary policy plays a central role in shaping the direction of the economy, including trade policy. Empirical studies have found that controlling corruption through improved institutional quality can reduce dollarization and exchange rate volatility, underscoring the importance of institutions in technology adoption, incentive schemes, and other control measures (Charles et al., 2023).

CONCLUSION

Based on the results of data processing and panel data regression analysis, the independent variables, namely exchange rates, inflation, labor force, technology, and government effectiveness, were found to simultaneously influence international trade. The partial analysis indicates that exchange rates, inflation, and government effectiveness had significant positive effects on international trade. Meanwhile, labor force and technology did not have significant effects on trade at the 5% significance level. The coefficient results show that the labor force variable had a positive effect, whereas the technology variable had a negative effect on international trade in D-8 member countries. These findings highlight the need for D-8 member countries to improve and reassess their labor policies and technological innovation strategies to strengthen trade performance.

Institutional policies related to labor, including wage regulations, employment systems, and workers' rights, should align with applicable standards and regulations. Such policies may influence a country's attractiveness to foreign investment and international trade cooperation. Countries with more competitive and flexible labor regulations may attract multinational corporations seeking efficient production costs. Another important factor is the development of technological infrastructure. Although this study found that technology did not significantly affect trade, adequate technological capacity can potentially facilitate trade processes, reduce transaction barriers, and enable countries to obtain greater benefits from international trade.

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