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Assessment and Analysis of Stock Market Integration among the Countries of the D8 Group

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ABSTRACT

The D8 group pursues different goals, and one of the most important ones is in the field of economy and economic development of the member countries. The present study thoroughly assesses financial integration and its effective variants. Due to the relatively low physical capital interruption and the more intrinsic consumption fluctuations, developing economies benefit from financial integration. Four criteria have been used to assess the financial integration among the D8 group: foreign assets, foreign debts, volume criteria, and investment criteria. The data is based on Eviews software, and the least-squares method (EGLS) for 2000-2019 has been analyzed. The present study results confirm the effect of financial development and international trade integration on financial integration, and between the two, based on the estimated model coefficients, the impact of international trade integration on financial integration is more significant. Also, among the three criteria of financial development, the development of the banking sector is not a good measure of the financial development in countries and has less of an impact on D8 Group's financial integration.

1. Introduction

Financial liberalization allows foreign investors to invest in domestic financial markets and allows domestic investors to trade in foreign financial markets. In recent decades, countries have witnessed unprecedented

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financial liberalization of financial markets around the world, and although financial liberalization is thought to have a significant potential impact on economic growth, improving welfare as well as reducing risk, there is no general agreement on its various benefits (Lyon, 2003; Gringer, 2013). The degree of financial liberalization, taking into account different time periods, affects the volatility of the whole stock market. In a way that cannot be ignored the negative impact of all volatility accumulated with the rate of financial liberalization, even after controlling market development, liquidity, the effects of countries and crises, especially for small and medium-sized emerging markets. Therefore, increasing the degree of financial liberalization will have a decreasing effect on the total volatility. Many studies also suggest that developing economies will benefit most from financial integration due to the relatively small interruption of physical capital and the more significant fluctuations inherent in consumption (Lou, 2013).

According to Ballet et al. (2004), full integration requires equal access to banks, trade, and clearing platforms for investors and firms, regardless of their region of origin. Once granted access, full integration requires that there be no discrimination between market participants. As far as financial market integration is concerned, this concept has been developed for a long time, even if none of the definitions can be generally accepted. Based on the existing definitions of financial market integration are defined in terms of one or more aspects: the mechanism that equals the price of risk (Kararand, 2004), the mobility of capital flows, and the completeness of the international financial market (Carney and Lucy, 2004), also from the perspective of Risk Price Equivalence, Stolls (1981) argues that if two assets that have a return equivalent to a given currency but belong to different countries have the same expected return, the asset markets are fully integrated internationally. Beckhart and Harvey (1995) argue that markets are fully integrated if assets with similar risk, regardless of location, have similar returns.

Similarly, Levin and Zeros (1998) argue that capital in integrated financial markets must flow across international borders to equalize the price of risk. In terms of capital flow mobility, Riddle (1997) argues that if capital is free to enter and leave the country and if its assets can replace the assets of other countries, a country is integrated into global capital markets. In terms of financial market integrity, Stockman (1988) argues that full financial market integration exists when economic and financial market participants can be insured against the predicted nature through a complete set of international financial markets.

Financial integration has several benefits, including reducing the cost of capital, developing the local financial sector, improving the quality of institutions and expertise, and increasing competition between domestic and foreign investors. The D8 Group pursues several goals for the economic growth and development of the member countries. Also, numerous studies indicate the positive effect of financial market integration on the economic growth and development of the nations. in the first stage, the present study tries to evaluate the variables affecting financial integration (financial development and international trade integration). Finally, if Group D8 financial markets merge, What effect will it have on these countries' economic growth and development?. It should be noted that four criteria have been used to calculate financial integration and three criteria for financial development, which has not been seen even at the international level, and this is the subject of innovation and the importance of research.

2. Theoretical and Empirical Foundations of Research

1.2. The difference between financial integration and market

Interdependence in general, some existing literature, due to many similarities, cannot distinguish market integration from market interdependence. On the one hand, some researchers consider market integration the same as market interdependence (including Rocca and Brimble, 2005; Belotti & Williams, 2004; Sain et al., 2010). For example,

Campbell and Hamao (1992) believe that the two countries' joint move-in expected surplus returns suggest a long-term capital market merger. Bricker et al. (1999) used the degree of market improvement to reflect stock market mergers. On the other hand, many researchers cannot accurately discern methods of measuring market integration from market interdependence methods, although they found that market integration and market interdependence are different topics. An extensive series of empirical studies examine market integration through instability or market improvement, which reflects market interdependence (including Megireh and Alziubi, 2005; Carverhill & Chan, 2006; Berben & Jensen, 2009; Chavi and Dupont, 2007: Belly, 2009; Cheng and Glasgow, 2006).

By comparing the definitions and determinants of market integration and market interdependence, it can be quickly concluded that market integration and market interdependence are two very interconnected but different issues (Hey et al., 2014):

-Market integration and market interdependence reflect different aspects of the financial market, although they have a lot to do with each other. Market integration is mainly to remove trade barriers of any kind in cross-border transactions in openness and unity in financial markets such as financials.

-The integration of the financial market and the interdependence of the financial market are entirely different from the determinants, although they have some common factors. Apart from market integration, many determining factors affect market interdependence. In some cases, these factors can dominate the impact of financial market integration and lead to anomalies of market interdependence.

2.2. Perspectives on financial integration

Many empirical studies such as (Ang & Zhang, 2013; Lu, 2013; Evans & Hantkovska, 2014) show the potential benefits and prosperity resulting from financial integration in terms of risk division benefits, investment activity,

stock market development, and overall economic growth. The risk-sharing literature argues that financial integration should provide other opportunities for risk-sharing and inter-temporal consumption smoothing, i.e., since financial integration shows the facilitation of risk division, hence it should increase the allocation of production and capital. On the other hand, due to the relatively low interruption of physical capital and inherent fluctuations in most consumption, developing economies seem to benefit most from financial integration. In addition to increasing the collection of financial instruments and mutual ownership of assets arising from financial integration, countries should provide other possibilities for diversifying securities and dividing their specific risks. The financial market integration increases the benefits of risk-sharing through financial markets, which may create an economic incentive for countries to become members of the currency union and governments to stop controlling their monetary policies. It is also influenced by banking development and the stock market. Stock market liberalization is given as a concession to foreign investors, which will compete with domestic investors and thus increase real annual economic growth. In contrast, empirical evidence shows that financial development strengthens investment and trade by re-allocating capital. These are the importance of financial integration for Achieving economic development, and thus economic growth is more prominent (Vitsonti and Kumarasinge, 2016).

2.3. Important indicators for evaluating the degree and speed of stock market integration

If similar assets issued in different countries have the same returns, financial markets will merge. If that is not the case, it shows obstacles to a capital movement that hinder market integration. Four essential indicators for evaluating the degree and speed of stock market mergers are:

Credit indicators and bond market integration: The first category is the actions of credit indices and the merger of the bond market. Interest rate

difference is the most common measure of credit market integration. Credit market integration indicators are particularly applicable in a single currency area, as there is no exchange rate risk. Interest rate difference is used to analyze the convergence rate in the interbank market, the government bond market, and corporate lending markets in the eurozone (Vermeulen & Die Han, 2014).

Stock Market Merger Indices: The second category is the actions of stock market merger indices. A simple indicator that was taken to integrate the stock market out of the correlation dynamics of stock market returns. The important thing is that increasing solidarity is not necessarily proof of financial integration, as it may reflect changes in the correlation between natural shocks and policymaking in each country. This indicator will only be used to measure the amount of financial integration to the extent that the random trend of standard shocks is constant over time. This means how much returns in other markets can help explain returns in a particular market. Also, the squared residuals compare a simple univariate autoregressive model for each efficiency and square residuals of a vector autoregressive model for the efficiency of all countries. Since the sum of square residuals decreases due to market returns to explain the behavior of stock returns, it can be interpreted as a sign of increased financial bonding (Ballet et al., 2004).

Integration indicators based on economic decisions of households and companies: The third category of indicators is based on the economic decisions of households and companies, especially their choice between foreign and domestic assets. One of the classic tests of financial integration is based on the correlation between savings and investments. Under full capital mobility and unchanged investment opportunities, increasing savings rates in one area will increase investment in all regions. Significant correlations between national savings and investment indicate strong divisions. The Feldstein-Horioka test linked the amount of more domestic savings in a country with higher domestic investment rates. However, as for

the full mobility of global capital, there is no connection between domestic savings and domestic investment, as the savings decision in each country is a response to global opportunities for investment, and the investment is made by a global capital (Jopley & Pagano, 2008; Adam et al., 2002; Morley, 2010).

Institutional difference indicators that may indicate the financial market division: The fourth category of financial merger measures is based on institutional difference indicators in how the legal system works and corporate governance arrangements. Indicators based on legal institutions do not examine the division or integration of financial markets but rather the reasons for the division. For example, if there are ongoing interest rate disputes and the same financial instruments in the two countries, institutional characteristics can check whether the division problems lie in the different tax codes of the two countries (Valleti, 2011).

2.4. Determinants of Financial Integration

Since there is no good theory about the determinants of financial market integration, the present study summarizes the literature on this issue and categorizes the determinants into seven groups. These groups are:

Advances in information and computer technology: Advances in information and computer technology have facilitated cross-border transactions. Advances in INFORMATION technology make it easier to collect and process information in financial risk management and pricing and trading complex financial derivatives in international financial centers (Haussler, 2002; Obadan, 2006).

Liberalization of National Financial Markets (Financial Openness), (Haussler, 2002): Financial market development may increase the degree of pricing efficiency and provide a better regulatory and institutional environment. Generally, these improvements will partially reduce barriers to cross-border transactions. On the one hand, improving asset pricing efficiency by sending good price signals for capital allocation across the

country is helpful. On the other hand, progress in the regulatory and institutional environment can reduce the irrational behaviors of investors. For example, Mork et al. (2000) noted that inadequate superannuation protections might lead to arbitrage disruption and make noise traders.

Financial development: Finally, the liberalization of the financial market plays an essential role in integrating the international market. Financial liberalization has not only not limited to international financial transactions, but it has also partially lifted regulations restricting foreign participation in domestic capital markets. Haussler (2002) noted that, for example, financial liberalization has boosted financial innovation and stimulated the growth of capital flows across the border. Financial development continuously improves and expands financial functions, resulting in increased financial efficiency and economic growth. Also, the institutional environment of the economy plays an essential role in determining the country's financial development. Developing the financial sector in developing countries and emerging markets is part of the private sector's development strategy to stimulate economic growth and alleviate poverty (Boone, 2018).

GDP growth (changes in GDP): Economic growth is measured as the percentage of annual change in the gross domestic product (GDP); the economic growth rate of countries is usually compared using the ratio of GDP to population (per capita income).

Interest rate spread: The difference between the price offered by the buyer and the price offered by the seller is the spread of the buy and sell price. Spreads may also refer to the difference in the price of orders sent by traders on the market. The gap between a buying position and a selling position in a futures contract or foreign exchange market, such as (the difference between the deposit interest rate for the country I and the U.S. money market rate), is another condition in which the term spread is used.

Real exchange rate: The real adequate currency is the weighted average of a common currency to another important currency index or basket. Weights are determined by comparing the relative trade balance of a

country's currency against other countries within the obtained index. This exchange rate determines the value of a country's currency compared to other major currencies in this index. The first difference is in the natural logarithm of the currency. In general, the positive value of exchange rate returns indicates an increase in the value of the U.S. dollar against the country's currency i. All of these factors together somehow influence the integration of the financial market (Obadian, 2006 Anne and Zhang, 2013). According to the above theoretical foundations, the research hypotheses are as follows:

-The amount of financial development of D8 member states positively affects stock market integration between them.
- The amount of international trade integration of D8 member states positively impacts the stock market merger between them.
- Among the variables of international trade integration and financial development, the impact of international trade integration on stock market integration is more significant.

2.5. Related Research

Etsin and Premier (2017), in a study entitled "Financial Liberalization and Development of Stock Markets in Sub-Saharan Africa," have reviewed using empirical analysis method of three Bayesian VAR models using quarterly data for the period 1975 - 2014. The results show a positive correlation between stock market development and liberalization of stock markets and the financial sector in all four countries that are proponents of opening financial markets to international investors. On the other hand, policymakers in these countries should pay special attention to inflation-targeting policies to positively strengthen these markets. Vermeulen and Mouth (2016) have been investigated using a cross-sectional regression approach in a study entitled "The Net Position of Foreign Assets Is Financial Development Important?" The results show that financial development helps reduce global imbalances in the long run. However, it will take a long time for economic

development to significantly impact economically, as the results show that the average speed of error correction is not very high. That is, on average, about 16 percent of the gap between the current and long-term positions closes each year. Whitsonetti and Kumarsinghe (2016) have examined data panel regression in a study entitled "Financial Development, International Trade Integration and Stock Market Integration (Evidence from Asia)." The results indicate that the degree of stock market integration cannot be explained by changes in the integration of bilateral international trade.

Evans and Hantkovska (2014), in research entitled "International Capitals, Returns and Financial Integration of the World," have been examined using data panel regression. The findings suggest that as global stock markets merge, the size and volatility of international bond flow decreases, and the natural result of risk division is facilitated by increased integration. Ann Gavin and Trang (2013), in research entitled "The Content of Information on Stock Markets around the World: A Cultural Explanation Using Logistic Regression," has been investigated. The results indicate that to measure the content of general stock exchange information in the long term, abnormal returns, and abnormal trading volume around profit, it evaluates the market model to measure the content of short-term information of declared profits. On the other hand, the content of stock exchange information is higher in more individualistic countries and countries with uncertainty. Anne and Zhang (2013), in a study entitled "Stock Price Synchronicity, Falling Risk and Institutional Investors," examined using data panel regression. Using a panel sample of 15 developed and developing countries in Asia between 1985 and 2013, they show that a country's financial development positively impacts the integration of its stock market with the world stock market, and the integration of a country's international trade is not that way. Finally, they state that the degree of bilateral stock market integration cannot be explained by changes in the integration of international bilateral trade.

Lew (2013), in research entitled "Stock Market Interdependence: Are Developing Markets the Same Underdeveloped Markets?" reviewed using the data panel regression approach. Finally, the results indicate that information capacity and similarity of the industrial structure have a significant effect on the correlation between a developed market and other markets. Freins et al. (2012), in a study entitled "Political Crises and Stock Market Integration of Emerging Markets," examined using time series regression. The results indicate that crises with specific characteristics generally reduce stock market integration in these areas. In particular, the beginning of a political crisis, its intensity, the U.S. conflict, and the number of parties involved in a crisis all affect stock market integration in these markets.

Most previous research has focused on the impact of financial integration on one or more countries and has ignored the impact of different financial development indicators and international trade integration. However, in this study, we have tried to evaluate the variables affecting financial integration (financial development and international trade integration) separately and with their sub-branches. Finally, answer the question: What effect will the D8 financial markets have on these countries' economic growth and development if they are integrated? It should be noted that four criteria have been used to calculate financial integration and three criteria for financial development, which have not been seen even at the international level, and this is the subject of innovation and the importance of research.

3. Research Methodology

Information on independent and dependent variables and research control for D8 member states from 2000-to 2019 will be evaluated. The study ranged from 2000 to 2019 and includes member states of the D8 Group: (Iran, Turkey, Egypt, Pakistan, Bangladesh, Indonesia, Malaysia, and Nigeria).

Much of the information about research variables will be extracted by referring to World Bank site data. Therefore, the data collection method is a library of documentary branches. This research is applied and descriptively correlated in terms of research method in terms of purpose. A library method such as books, journals, articles, and theses has been using panel data and the EGLS method, the pattern is estimated and its related tests such as the permanence of research variables and the test of heterogeneity of variance, normality, and lack of autocorrelation in the model are investigated.

The model used in this study is derived from the Study of Whitsonetti and Coumarasingbe (2016), with few changes in adding the research variables.

$$FI_{i,t} = \alpha_i + \beta_1 FD_{i,t} + \beta_1 ITI_{i,t} + \sum_{j=2}^{n} \lambda_j CONTROL_{i,t} + \varepsilon_t \quad (1)$$

For this reason, it is expected that the high volume of capital entry into GDP could be the reason or consequence of a higher level of stock market integration. To test the prediction that a country's international trade integration with its trading partner is positively correlated with the stock market merger with the trading partner stock exchange, the amount of stock market integration of D8 member states should be measured. Introduction of variables is shown in Appendix 1.

4. Research Findings

4.1. Descriptive statistics

Descriptive statistics show a general overview of the status of the data so that with its general understanding, it is possible to ensure the distribution and distribution of data.

Table 1. Descriptive statistics

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
IFIA	0.119	0.106	0.251	0.028	0.080	0.534	1.898
IFIL	0.020	0.004	0.094	0.002	0.034	1.607	3.740
IFIT	0.136	0.110	0.316	0.032	0.101	0.757	2.135
IFIEDQ	0.019	0.014	0.065	-0.007	0.021	1.012	3.148
BSD	0.413	0.315	1.067	0.134	0.284	1.294	3.629
SMD1	0.306	0.249	0.640	0.120	0.176	0.779	2.347
SMD2	0.177	0.091	0.451	0.008	0.171	0.569	1.601
ITI	0.465	0.456	0.651	0.321	0.112	0.365	1.950
FO	0.333	0.178	1.119	0.017	0.394	1.197	2.891
GDP_GROWTH	0.049	0.052	0.075	0.010	0.020	-0.639	2.456
INTSPREAD	0.040	0.046	0.073	-0.017	0.027	-0.870	2.888
REER	0.986	0.986	1.192	0.777	0.130	0.035	2.018

Source: Research finding

In general, if the skewness and elongation are not in the range (-3, -3), the data do not have a normal distribution. If we decide to remove pert observations, it can decrease the degree of freedom. Also, some believe that off-domain observations contain information that, if they are deleted, the information will be ignored. The number related to the recent percentile is used in the data restoration method instead of deleting them for observations less than the 5th percentile, the number related to the mentioned percentile. For observations larger than the 95th percentile, the number related to the recent percentile is the number. The Winzorizing test will improve the skewness and elongation of variables and close them to the normal distribution of the standard. Table (1) shows descriptive statistics of variables after repairing part observations.

4.2. Determinants of Financial Integration

Table 2. Determinants of Financial Integration

Determinants of Financial Integration.

Panel C: *Financial Integration, Banking Sector Development (BSD), and International Trade Integration. Regression model.*

	IFIA	**IFIL**	**IFIT**	**IFIEDQ**
C	0.098*** (2.73)	-0.043*** (-10.418)	0.129*** (5.753)	-0.031 (-1.798)
BSD	-0.015 (-0.089)	0.096*** (49.557)	-0.027* (-1.688)	0.031*** (3.650)
ITI	0.237*** (5.832)	0.025*** (5.006)	0.176*** (7.251)	0.038* (1.953)
FO	0.016* (1.702)	0.001 (1.003)	-3.013*** (-3.614)	0.009** (2.095)
GDPG	0.144 (1.035)	-0.044*** (-2.781)	0.044 (0.752)	-0.026 (-0.401)
INTSPREAD	-0.225* (-1.869)	0.277*** (17.074)	-0.173** (-1.996)	0.114* (1.795)
REER	-0.089*** (-3.554)	0.002 (0.832)	-0.055*** (-3.657)	0.012 (1.050)
R-squared	0.839	0.986	0.987	0.456
F-statistic	107.908***	1536.764***	755.987***	17.283***
Durbin-Watson stat	1.792	1.699	1.503	2.044
Effects	*cross-section fixed effects*	*Pooled*	*cross-section fixed effects*	*cross-section fixed effects*
Source: Research finding *Observations = 160*				
t statistics in parentheses				
** p < 0.10, ** p < 0.05, *** p < 0.01*				

The results show that the research variables have different behaviors in each of the criteria of financial integration so that the banking sector development variable (BSD) has a positive and significant effect on financial

integration between D8 member states in two criteria of foreign debt (IFIL) and foreign investment criterion (IFIEDQ). In this way, with an increase of 1% in the development of the banking sector, financial integration will increase by 3 to 9% in the two mentioned criteria. Also, integrating international trade (ITI) in all criteria has a positive and significant effect on financial integration. With a 1% increase in international trade integration, financial integration will increase by 3 to 23%. The significance of Fisher's (F) statistics at the 5% level indicates the significance of all the above models. The coefficient of determination shows that independent variables in the three criteria above explain 80% of the changes in the dependent variable. The amount of camera statistics – Watson also shows that the remainder of the model does not have serial autocorrelation. The variance of the model can also be ensured because considering cross-section weight in the method of calculating the covariance matrix of coefficients. Therefore, the results are not false and can be relied on to measure financial integration.

Table 3. Determinants of Financial Integration

Determinants of Financial Integration.

Panel D: *Financial Integration, Stock market development (SMD1), and International Trade Integration. Regression model.*

	IFIA	**IFIL**	**IFIT**	**IFIEDQ**
C	0.119***	-0.017**	0.122**	0.017*
	(3.431)	(-3.060)	(2.999)	(1.776)
SMD1	0.160***	0.024***	0.159***	0.016**
	(9.004)	(6.724)	(7.384)	(2.211)
ITI	0.154***	0.050***	0.198***	0.019*
	(4.268)	(6.419)	(4.919)	(1.853)
FO	0.003	0.019***	0.004	0.021***
	(0.398)	(7.747)	(0.470)	(6.738)
GDPG	0.080	-0.106***	0.138	0.028
	(-1.785)	(-5.036)	(0.950)	(0.553)
INTSPREAD	-0.177*	-0.077***	-0.060	0.005*
	(-1.785)	(-3.502)	(-0.507)	(0.099)

	IFIA	**IFIL**	**IFIT**	**IFIEDQ**
REER	-0.122*** (-4.926)	0.004 (0.999)	-0.136*** (-4.680)	-0.021*** (-3.321)
R-squared	0.872	0.978	0.904	0.551
F-statistic	140.221***	863.780***	195.370***	13.797***
Durbin-Watson stat	1.666	1.692	1.537	1.777
Effects	*cross-section random effects*	*Pooled*	*cross-section random effects*	*cross-section fixed effects*
Source: Research finding *Observations = 160*				
t statistics in parentheses ** p < 0.10, ** p < 0.05, *** p < 0.01*				

Regarding the effect of the stock market development variable (which is the ratio of the stock market capitalization of listed companies to GDP (SMD1) on financial integration between D8 member states, the obtained relationships show a positive and significant effect on all criteria of financial integration, i.e., foreign assets (IFIA), foreign debt (IFIL), volume criterion (IFIT) and foreign investment criterion (IFIEDQ). With a 1% increase in the stock market development variable, financial integration will increase by 1 to 16% in the four mentioned criteria. Also, integrating international trade (ITI) in all criteria has a positive and significant effect on financial integration. With a 1% increase in international trade integration, financial integration will increase by 1 to 19.8%. The significance of Fisher's (F) statistics at the 5% level indicates the significance of all the above models. The coefficient of determination shows that independent variables in the three criteria above explain 87% of the changes in the dependent variable. The camera-Watson statistics also show that the remainder of the model does not have serial autocorrelation. The variance of the model can also be ensured because considering cross-section weight in the method of calculating the covariance matrix of coefficients. Therefore, the results are not false and can be relied on to measure financial integration.

Table 4. Determinants of Financial Integration

Determinants of Financial Integration.

Panel E: Financial Integration, Stock market development (SMD2), and International Trade Integration. Regression model.

	IFIA	**IFIL**	**IFIT**	**IFIEDQ**
C	0.094** (2.577)	-0.018*** (-3.519)	0.099*** (2.341)	-0.038** (-2.120)
SMD2	0.093*** (5.734)	0.011*** (5.582)	0.100*** (5.746)	0.012 (1.442)
ITI	0.203*** (5.101)	0.045*** (7.055)	0.243*** (5.813)	0.065*** (3.203)
FO	0.010 (0.398)	0.022*** (10.413)	0.011 (1.141)	0.017*** (3.445)
GDPG	0.056 (0.444)	-0.065*** (-3.690)	0.109 (0.752)	-0.031 (-0.453)
INTSPREAD	-0.152 (-1.307)	-0.078*** (-4.364)	-0.033 (-0.253)	0.016 (0.270)
REER	-0.088*** (-3.433)	0.007** (2.112)	-0.103*** (-3.487)	0.019 (1.615)
R-squared	0.857	0.959	0.896	0.434
F-statistic	123.692***	487.085***	177.780***	15.820***
Durbin-Watson stat	1.779	2.061	1.681	2.148
Effects	*cross-section random effects*	*Pooled*	*cross-section random effects*	*cross-section random effects*
Source: Research finding *Observations = 160*				
t statistics in parentheses				
** p < 0.10, ** p < 0.05, *** p < 0.01*				

Also, regarding the effect of the stock market development variable (which is the ratio of total stock value to gross domestic oil (SMD2) on financial integration between D8 member states, the obtained relationships show a positive and significant effect on three criteria of financial integration: foreign assets (IFIA), foreign debt (IFIL), volume criterion

(IFIT). With a 1% increase in the stock market development variable, financial integration will increase by 1 to 10% in the three mentioned criteria. Also, integrating international trade (ITI) in all criteria has a positive and significant effect on financial integration. With a 1% increase in international trade integration, financial integration will increase by 4 to 24.3%. The significance of Fisher's (F) statistics at the 5% level indicates the significance of all the above models. The coefficient of determination shows that independent variables in the three criteria above explain 85% of the changes in the dependent variable. The variance of the model can also be ensured because considering cross-section weight in the method of calculating the covariance matrix of coefficients. Therefore, the results are not false and can be relied on to measure financial integration.

5. Conclusions and Discussions

The rate of financial integration worldwide has increased significantly, especially over the past two decades. This is due to the further globalization of investments, which seeks higher rates of return and the opportunity to diversify the risk created internationally. Many countries lift restrictions on international financial transactions, adjust regulations on the performance of domestic financial markets and improve the economic environment and prospects by introducing structural reforms in the market and moving away from financial repression laws aimed at increasing the financial openness of domestic markets for foreign investors, which will create a competitive atmosphere with domestic investors. On the other hand, considering that several the benefits of financial integration for developing countries have been expressed, it can be concluded that financial integration will lead to economic growth and development of developing countries.

The first hypothesis of the research: The amount of financial development of D8 member states affects the stock market merger between them.

The benefits and costs of economic development and integration are widely discussed in the literature. On the one hand, some researchers (Commonwealth and Rinehart, 2002; Stiglitz and Osampo, 2008; Stigels, 2004) show that capital market liberalization leads to instability of financial markets and increased likelihood of currency/bank/economic crises. For example, Patro (2005) found that volatility in stock markets increases up to three years after the official market liberalization in eight emerging markets. On the other hand, some researchers (e.g., Aung and McKibbin, 2007; Barajas et al., 2000; Bekaert & Harvey, 2000; Bekaert et al., 2005; Bodnar, 1994; Forbes, 2005; Henry, 2000, Anne & Zhang, 2013, Whitsonetti & Kumarsinghe, 2016) shows that the liberalization of capital markets seems to create better economic conditions (e.g., reduced exchange rate fluctuations, declines Capital expenditures, better access to capital markets) where companies operate, which may lead to economic growth. For example, Lavon (2003) found that, following financial liberalization in 13 developing countries, small businesses become more financially limited while large enterprises become more financially limited. Financial development in the present study has been evaluated according to three criteria (banking sector development—equity market development capital ratio in the stock exchange of listed companies to GDP). Stock market development (ratio of the total value of traded stocks to GDP) the results of the first hypothesis test according to the different financial merger indices (4 criteria): Foreign assets, foreign debts, volume criteria, and investment criteria) Moreover, evaluating financial development through various indicators (3 criteria: banking sector development, the capital ratio on the stock exchange of companies accepted to GDP, and the total value of traded stocks to GDP) shows different results. According to these explanations, the following table indicates the estimation of 12 research models for the first hypothesis:

Table 5. The First Research Hypothesis

The first research hypothesis

Financial Integration, Criteria for financial development. Regression Results.

	IFIA	**IFIL**	**IFIT**	**IFIEDQ**
BSD	-0.015 (-0.089)	0.096*** (49.557)	-0.027* (-1.688)	0.031*** (3.650)
SMD1	0.160*** (9.004)	0.024*** (6.724)	0.159*** (7.384)	0.016** (2.211)
SMD2	0.093*** (5.734)	0.011*** (5.582)	0.100*** (5.746)	0.012 (1.442)

Source: Research finding

Of course, it is necessary to mention that since the subject of this research is different from previous research, the models of this research are different from other research and the variables used, so there can be no direct and explicit comparison to the obtained results.

Therefore, the results of this hypothesis were investigated in three different criteria of financial development. The results indicate that in the banking sector development sector (BSD), it is only significant in the criteria of foreign debts and investment criteria, and in general, due to the lack of development in the banking sector of developing countries, it can be stated that the banking sector development criteria cannot be a suitable criterion for evaluating financial development. On the other hand, stock market development based on the ratio of capital in the listed companies' stock exchange to GDP (SMD1) has the same results in all financial merger criteria. However, in the stock market development criteria (the ratio of the total value of traded stocks to GDP (SMD2)), we see positive and significant results in three criteria of financial integration, but there is no relationship in the investment criteria.

The second hypothesis of the research: the amount of international trade integration of D8 member states affects the stock market merger between them.

Integrating trade internationally compared to domestic trade is a complex process. When trade merges between two or more countries, currency, government policies, economy, judicial system, laws, and markets affect trade. Some international economic organizations, such as the World Trade Organization, were formed to smooth and justify trade between countries with different economic conditions. Anne and Zhang (2013) and Whitsonetti and Kumarsinghe (2016) argue that there is a complete integration of the financial market when economic and financial market participants can be insured against the anticipated nature through a complete set of international financial markets.

According to the above explanations, it can be found that the integration of international trade always has an essential factor affecting financial liberation and capital markets integration. The results of this study have proved this issue by calculating the integration of international trade between countries from the sum of exports and imports of each country divided by GDP can be used. The test results of the second hypothesis are related to the different financial merger indices (4 criteria: foreign assets, foreign debts, volume criteria, and investment criteria) and by evaluating the international trade integration index as follows. According to these explanations, the following table indicates the estimation of 12 research models for the second hypothesis:

Table 6. The Second Research Hypothesis

The second research hypothesis

Financial Integration, International Trade Integration. Regression Results.

Models		**IFIA**	**IFIL**	**IFIT**	**IFIEDQ**
BSD	ITI	0.237***	0.025***	0.176***	0.038*
		(5.832)	(5.006)	(7.251)	(1.953)
SMD1		0.154***	0.050***	0.198***	0.019*
		(4.268)	(6.419)	(4.919)	(1.853)
SMD2		0.203***	0.045***	0.243***	0.065***
		(5.101)	(7.055)	(5.813)	(3.203)

Source: Research finding

Of course, it is necessary to mention that since the subject of this study is different from previous research, the present study models are different from other research and variables used, so there can be no direct and explicit comparison with the obtained results.

The Third hypothesis of research: Among the variables of international trade integration and financial development, the effect of international trade integration on stock market integration is more significant.

According to the results, it can be easily found that the impact of international trade integration in D8 member countries on stock market integration has a positive and more significant impact on financial development because, in most methods of evaluating stock mergers, the impact of about 1 to 24 percent of international trade integration is seen, while in financial development these coefficients are less. Therefore, it can be concluded that international trade integration has a more significant impact on the financial integration of D8 member states than financial development. In this study, all the criteria for financial integration have been investigated. This case has differentiated and differed from previous research because in previous research, at most, one or two criteria have been used for financial integration. Therefore, it should be noted that comparing the results of the present study with previous research in this field makes the analysis of the results difficult, both in terms of theoretical literature and econometric topics. Of course, in previous research, the positive and significant relationship between international trade integration and financial development with financial integration has been reported, which is a confirmation of the accuracy of the research hypotheses.

Of course, no research, especially in the field of humanities, will be free of limitations. Therefore, these limitations should be clearly and explicitly stated to be considered and generalized by the researcher and the research audience. the present study has some limitations because some of the specific conditions governing it, as follows:

-Since countries have not continuously updated the data or their data has not been available, this has reduced the sample size of the present study.

-People's abilities in information processing also vary. Consequently, different perceptions of the entry of similar information from countries can likely be seen by researchers. In other words, the existence of several different databases with different figures also selects and makes the researchers' decision to investigate the variables doubtfully.

-Assessing the impact of financial development on stock market integration between Iran and its trading partners, emphasizing distinguishing between the level of development of the studied countries.

-Assessing the impact of international trade integration on stock market integration in situations where the two countries have a very close relationship in terms of trade.

-Re-examining this issue by changing the explanatory variables of the research can also reveal other variables affecting financial integration.

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Appendix 1.

Table 7. Variable Definitions

Appendix B. Variable definitions

	Variable	Definition
FI	IFIA	The first criterion for international financial integration is the asset-based criterion: $IFIA_{it} = \frac{FA_{it}}{GDP_{it}}$ FA_{it}: Foreign Assets GDP_{it}: GDP (current US$)
	IFIL	The second criterion of international financial integration is the debt-based criterion: $IFIL_{it} = \frac{FL_{it}}{GDP_{it}}$ FL_{it}: Foreign Liabilities
	IFIT	The third criterion for international financial integration is the volume-based criterion, which includes the sum of assets with foreign debt: $IFIT_{it} = \frac{FA_{it} + FL_{it}}{GDP_{it}}$
	IFIEDQ	The fourth measure of international financial integration (IFIEDQ) measures investment-based financial integration (R. Al-Taiebi, 2014).$IFIEDQ_{it} = \frac{FDIA_{it} + FDIL_{it} + FPI_{it}}{GDP_{it}}$ $FDIA_{it}$: Foreign direct investment, net inflows (BoP, current US$) $FDIL_{it}$: Foreign direct investment, net outflows (BoP, current US$) FPI_{it}: Portfolio investment, net (BoP, current US$)
FD	BSD	Domestic credit to the private sector by banks (% of GDP)
	SMD1	The market capitalization of listed domestic companies (% of GDP)
	SMD2	Stocks traded, total value (% of GDP)
ITI		1)International trade integration is measured by the ratio of imports plus exports to GDP (in percent).
Control V	GDPG	GDP growth (annual %)
	REER	Real effective exchange rate index (2010 = 100)
	INTSPREAD	Interest rate spread (lending rate minus deposit rate, %)
	F.O.	Foreign direct investment, net outflows (% of GDP)

Source: WDI

It should be noted that the use of GDP as a derivative of data homogenization.

Appendix 2.

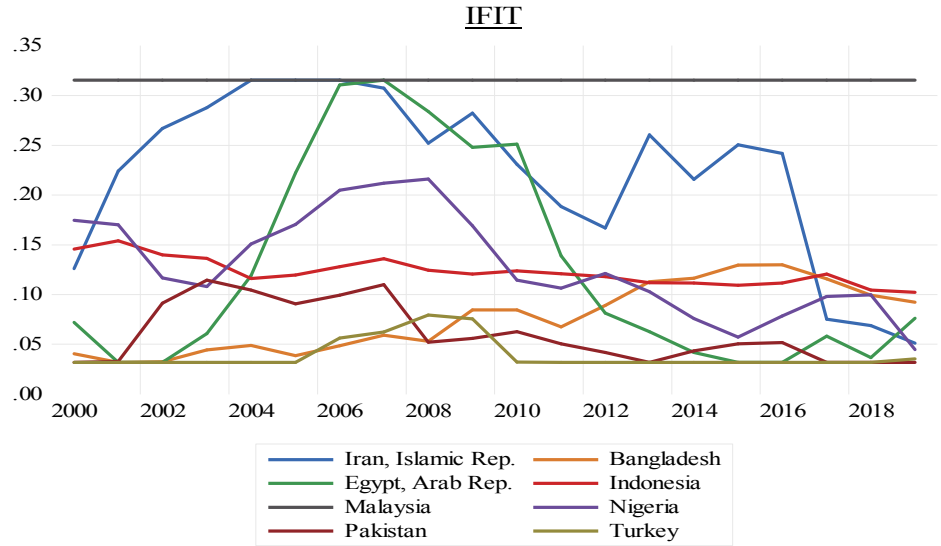

Fig1. Volume criterion for d8 countries

Source: Research Finding

As can be seen in the chart above, in the IFIT criterion (volume criterion), the financial integration of Malaysia and Indonesia in the periods under review has been stable, and Turkey has also had a stable trend from 2006 to 2010. On the other hand, a noteworthy point in this chart is the large fluctuation of Iran and Egypt in the years under study.

Appendix 3.

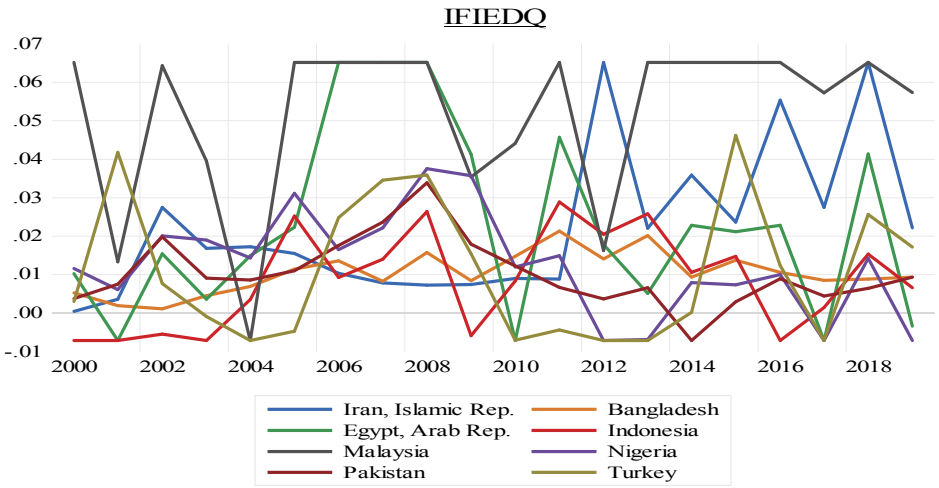

Fig 2. Changes in investment metrics for d8 countries

Source Research Finding

This Fig shows drastic changes in the investment criteria (IFIEDQ) of financial integration in Egypt, Turkey, Malaysia, and Iran. It can be seen in other countries.