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Integration, Interdependence and Contagion of Emerging and Developed Market

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ABSTRACT: *International diversification decreases systematic risk that can not decrease by domestic diversification. This research is about integration, interdependence and contagion in developed markets, emerging markets and a combination of developed and emerging markets in the Mortgage Crisis. Johansen is being used for how far developed market integrated hat emerging markets are . The Contagion was signed by increasing the correlation but there is a bias in correlation so Fisher is used in this research. The results of this study indicate that developed markets are more integrated than emerging markets. Therefore, investing in emerging markets can have less country than developed markets. Contagion happened in Ireland and Qatar. As a result, investment companies need to invest in interdependence country than in contagion country.*

KEYWORD: Integration, Interdependence, Contagion, Emerging Market, Developed Market.

INTRODUCTION

Globalization has positive and negative benefits. According to Beine *et al* (2009), the positive impact is the opportunity for investment companies to diversify assets internasionally so that investment companies can easily buy and sell assets. Another advantage of international diversification is that it can reduce the systematic risk in a country because of diversifying investments in other countries not related to that country. Stock investment diversification can pay attention to stock market interdependence in developing countries and emerging countries. One of them is using the Johansen cointegration method so that investment companies can find out how many stock market integration is. As a result, investment companies can determine the number of shares in a particular stock market in the grouping of developing countries and developed countries. Speidell *et al* (1992) stated that other benefits of diversification are markets that tend to move on their own causing their returns to be balanced with each other as well as when Japan falls, the US will rise.

The negative impact of globalization, according to Beine *et al* (2009) is that investment companies will find it difficult to obtain profits, especially in difficult times because the liberalization of the stock market will increase the comovement of the stock market, especially when financial conditions decline. These negative impacts are interdependence and contagion. Contagion is different from interdependence where interdependence is the relationship between the stock market of a country without any shocks or financial crisis.

According to Liu (2013), studying stock market interdependence is not only beneficial for investment companies to carry out diversification strategies, stock market interdependence but also is beneficial for policy makers who aim to stabilize the financial system and reduce contagion. There are many methods that can be used but correlation is one tool to see how much interdependence between stock markets.

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The stock market interdependence from year to year has increased in the United States based on Harvey (1991) so that investment companies have difficulty choosing the stock market. The reason is the increasing economic and financial relations of a country with other countries. It is this economic and financial relationship that causes any conditions that occur in a particular country to affect other countries if the interdependence between countries is high. The following is a graph of comovement between several stock markets in several countries. From the picture below, it can be seen that comovement of several stock exchanges is almost the same, especially during the global crisis as seen on the NYSE, CAC 40 and JKSE.

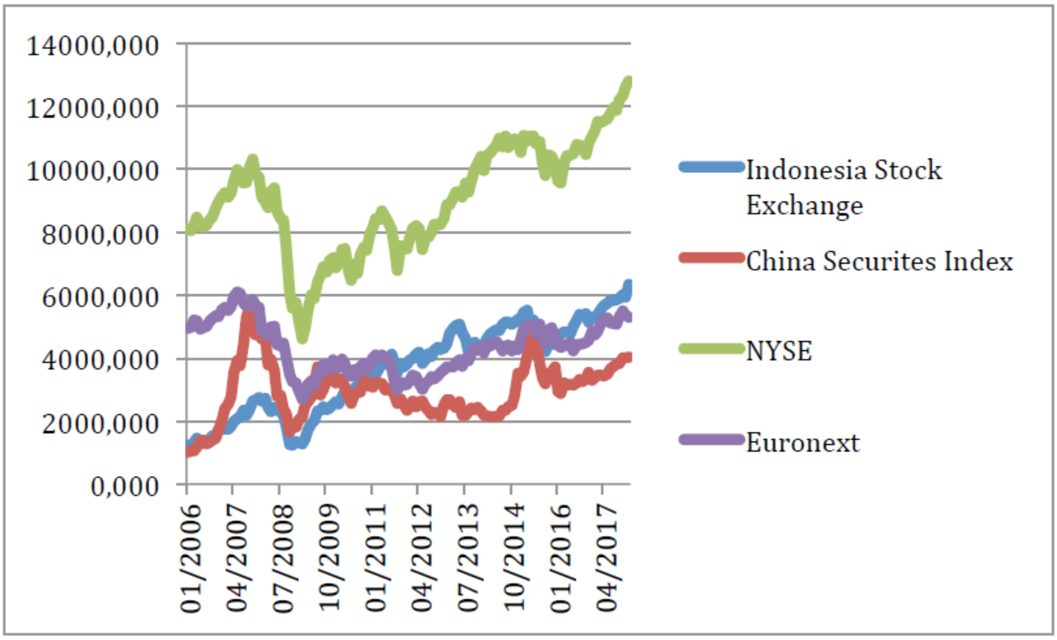

Figure 1 Stock Market Comovement

Sources: CEIC and Yahoo Finance

Increasing of relationship between a country and another country makes a problem in a country will become a domino effect in other countries. This can be seen in the picture above, especially when there is a global crisis. According to Gklezakou *et al* (2009), the correlation when the market bear is very small and the correlation when the market bullist is high but when the stock market is in a crisis the correlation is very high.

This event is often referred to as the contagion effect or contagious effect. But if there is contagion, the relationship between the stock market will increase. According to Pretorius (2001), economic integration is one of the causes of mutually integrated stock markets besides contagion, as well as cooperative relations between countries and interest rates or inflation in a country. The comovement chart during the subprime mortgage crisis can be seen in the picture above where there is a fall in stock market prices and this can be indicated that there is contagion in these countries.

Formulation of the Problem

Investment companies are always looking for opportunities to gain profits in the stock market so they try to reduce risk. One way to do this is to diversify the portfolio on the international stock market to reduce systematic risk. However, from year to year the stock market is increasingly integrated, so the opportunity to reduce systematic risk is getting smaller, coupled with the increasingly integrated stock market crisis. This research seeks to advise investment companies to see opportunities for integration, interdependence and contagion opportunities in developed or developing countries that are not yet integrated so that systematic risk can be reduced and investment companies need not worry about diversifying their portfolios on the international stock market.

Based on Harvey (1991), the correlation between countries from year to year is higher where the correlation of developed countries, namely the United States and European countries is higher than the correlation of developed countries in Asia. According to Gklezakou *et al* (2010), the conclusion is that stock markets in developed countries show an increase in correlation every year, besides when the stock market crisis will have a high correlation compared to when there is no crisis.

According to Agrawal (2017) states that the market will be integrated in times of crisis compared to before the crisis and after the crisis. This research can be useful to update previous research on integration and interdependence so that it can prove the conditions of integration and interdependence of the stock market.

Contagion is also one of the topics studied. By knowing which country is contagion and which country is only interdependence, investment companies can save funds in countries that do not experience contagion or can immediately transfer their funds to a safer place in the event of a crisis.

Yields are one of the triggers to invest in a country. The lowest return for 10 years occurred in 2008, namely when there was a global crisis. Developing countries have experienced a very drastic decline in returns, but in 2009 developing countries experienced a higher recovery of returns compared to developed countries. In addition, developing countries have an average return of 10 years which is higher than developed countries, so it can be concluded that developing countries are quite profitable.

According to Schill (2006), the prospect of high economic growth in emerging markets, high average returns, high volatility and low correlation between emerging markets and developed markets. Based on Mollah and Mubarek (2009), it is found that volatility in emerging markets is higher than developed markets. According to Anggriyani (2012), high volatility in emerging markets is related to macroeconomic factors such as politics, social and economy.

Based on the background and description above, the formulation of the problem that can be examined is

1. How is the integration relationship between developed and developing countries?
2. What is the interdependent relationship between developed countries and developing countries?
3. How do you contagion developed and developing countries?

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Research purposes

This research aims to

1. Analyze the integration of developed countries, developing countries and the combination of developed and developing countries.
2. Analyze the interdependence and contagion of stock markets in developing countries, developed countries and between developed and developing countries.

LITERATURES

Financial Globalization

Financial globalization is the integration of the domestic financial system of a country with international financial markets and institutions (Schmukler, 2004). Globalization is driven by the liberalization of the stock market and the increasing capital flow between countries. Globalization for investment companies is beneficial, especially providing an opportunity for investment companies to diversify their portfolios internationally.

According to Mishkin (2005), globalization has benefits for financial development, especially indirect benefits and direct benefits. Its indirect benefits are allowing foreign goods and incoming investments to enhance a more competitive environment. Financial globalization led to the development of finance, especially increasing competition with the domestic stock market by improving domestic stock markets. The immediate benefit of globalization is creating more efficient domestic financial institutions where technology transfers occur and improve information quality transparency. Another direct impact is increasing the availability of capital so as to increase liquidity and reduce the cost of capital which can stimulate investment and economic growth.

The risk of financial globalization for investment companies is to increase systematic risk where international diversification should reduce systematic risk, but because the stock market is increasingly integrated, systematic risk is increasing. Financial globalization can also cause a crisis where according to Schmuckler (2014), globalization can be associated with a crisis because:

1. When the state liberalizes the financial system this will be a necessity made by domestic and international investment companies. When the market is closed, only domestic investment companies will monitor the economy and bad economic conditions nationally, but if the financial market is open, foreign investment companies become one of the triggers of the crisis.
2. Globalization can cause a crisis if there are imperfections in international financial markets. Imperfections in financial markets can cause bubble, herding, speculative attacks and crashes. For example, if investment companies believe the exchange rate is not stable, they will speculate.
3. Globalization can cause a crisis due to the importance of external factors even though the country has a good economy and there are no imperfections in international capital markets. For example, interest rates really determine the entry of capital into developing countries.

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Stock Market Integration

The integration of the stock market is the occurrence of capital flow between countries which causes stock market prices or returns between countries to be almost the same. The higher the capital flow between countries, the higher the integration. According to Mailangkai (2013), capital market integration is a situation where the price of stock prices in various capital markets in the world has a very close relationship (closely correlated) between a capital market and other capital markets in the world and provides unlimited access or any obstacles to investment companies around the world to have it. Brook and Negro (2002) stated that the increasingly integrated world capital market market , marked by high correlation between stock returns and between stock prices. The integration of stock markets is due to the market similarity in income patterns and this contributes positively to domestic macroeconomics, can facilitate regional capital flows to multinational markets, technology transformation, financial deregulation allowing investment companies to expand their portfolios internationally and encourage stronger economic relations (Musrizal, 2013).

Based on the size of the integration market, it consists of two, namely regional integration and global integration. Regional integration is the integration between several countries located within an area or collected because they have similarities such as ASEAN and the European Union. Global integration is the integration of all countries so that what happens is called globalization.

Integration of stock market can also be seen from the difference in prices and comovement market. Measurement of market integration based on price differences is the occurrence of the same return in all stock markets on a stock found in several different stock markets so that the arbitration disappears. This condition is called the law of one price. In many studies it will usuallycompare whether a particular area is integrated or segmented.

Measurement of stock market integration based comovement stock market is moving at the same market at the same price or return. According to Hongbo (2012), the integration of the stock market will usually share in terms of economy and information between countries. In this study, we will see integration based on stock market comovement.

According to Sugisaki (1998), capital market integration has benefits and risks. The benefits of capital market integration are capital movements that are free to allow more efficient allocation of storage and resources directly to efficient use. Movements increase welfare both in destination countries and countries that provide by creating portfolio diversification, risk sharing and inter-temporal trade. The risk faced in capital market integration is contagion.

International Diversification

Increased awareness will be difference in performance of the stock market increases the appetite for portfolio diversification (Lesard, 1976). Besides that, it is also encouraged by the ease of investing both through financial globalization and ease of technology. One way that investment companies do to reduce risk is through diversification.

Diversification is dividing the funds owned to be put into several different assets so as to form a portfolio. Diversification is divided into two: domestic diversification and overseas or international diversification. Solnik (1995) shows that one way to reduce risk is to diversify internationally and domestically.

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The purpose of diversification in the country is to reduce unsystematic risk, which means that this risk can be eliminated if it forms a portfolio because this risk is found in one particular company (firm specific risk). Risk fluctuations are held by each different stock so the level of sensitivity to market changes is also different.

Another risk is systematic risk, which means that risks cannot be eliminated due to macroeconomic factors that affect the market. But there are ways to reduce this systematic risk by diversifying the portfolio internationally (Solnik, 1995). Where investment companies divide funds into assets both domestically and abroad. Where these macroeconomic factors do not influence each other toomuch . But during a crisis, systematic risk will increase.

Where the level of risk is getting higher, the higher the correlation. Bodie et al (2014) say that portfolios with asset combinations that have a low positive correlation will provide a better return-risk than each individual asset.

Interdependence and Contagion of the Stock Market

According to Forbes and Rigobon (2002) , if two markets have high comovement as long as conditions are stable even though the market still shows correlation after the crisis, it can be stated that this condition is interdependence. Contagion itself according to Forbes and Rigobon (2002) occurs if comovement increases when a crisis occurs. According to B ank World (2011) defines contagion in three terms, namely:

1. In general terms, contagion is the transmission of shock between countries or spillover effects between countries. This transmission can occur both in good and bad economic conditions and is not always related to the crisis but contagion is emphasized in times of crisis.

2. The definition is limited, contagion is the transmission of shock to other countries or cross-country correlation exceeds the fundamental economic relationship between countries and exceeds the relationship of economic fundamentals between countries and exceeds the shock that generally occurs. This understanding refers to correlations that exceed expectations, generally explained by herding behavior.

3. The definition of very limited contagion occurs when correlations between countries increase in times of crisis compared to correlations between countries at normal times.

According to Pretorious (2002), stock market interdependence can be divided into three, namely to test stock market relationships to determine how interdependence in a group, test changes in stock market relationships including preand post-crisis relations and finally the evolution of stock market relations. According to Liu (2013), there is a synchronization of the stock market with the economy, for example, according to Wälti (2011) found that monetary integration encourages stronger stock market synchronization, but according to Roll (1992) the same industrial structure is the main factor. According to Forbes and Chinn (2004) states bilateral trade is the main cause of the stock market having comovement with other stock markets but according to Flavin (2002) states the location of geography is the main cause. Stock market interdependence is studied besides being useful for evaluating the benefits and risks of diversification, according to Liu (2013) it is also useful for policy makers to stabilize the financial system and reduce financial contagion.

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Contagion is not caused by volatility or fundamental economics (Kolb, 2011). The reason might be caused by herding or the behavior of investment companies who follow other investment companies and do not pay too much attention to fundamental conditions, causing panic in the stock market. However, the location where contagion exists and the industry also needs to be considered as well as the causes of interdependence based on Roll (1992) and Flayin (2002). The contagion channel becomes diverse. According to Kolb (2011), the contagion channel is trade, creditors and investor perceptions.According to Hernández and Valdés (2000), there are three contagion channels, namely direct trade, neighboring securities and financial competition among the central banks.

RESEARCH METHODS

Types and Data Sources

Data used in this research is secondary data which is derived from the price of the stock exchanges of developed countries and air fireworks during the period 2006 2017 for integration. Research for interdependence and contagion used data from August 2008 to December 2012 for the crisis and before the crisis began in January 2006 . The data is obtained by downloading from CEIC. Table 4 Presents the stock markets of developed and developing countries used in this study where sampling is taken from the MSCI list with the stock market in Appendix 1.

Table 1 Advanced and Developing Country Stock Market Samples

Developed Country	Stock Market
Canada	Kanada Toronto Stock Exchange
United States of America	New York Stock Exchange
Belgia	Brussels Stock Exchange
Denmark	Copenhagen Stock Exchange
Finland	Helsinki Stock Exchange
France	CAC 40
German	Deutsche Borse Group
Irland	Irish Stock Exchange
Spanyol	Spanish Exchanges
Sweden	Stockholm Stock Exchange
Swiss	Six Swiss Exchange
Nederland	AEX
Austria	ATX
Norway	Oslo Stock Exchange
Developing Country	Pasar Saham

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Brazil	BM&FBovespa
Mexico	Mexico Stock Exchange
Qatar	Qatar Stock Exchange
Russia	Moscow Exchange
South Africa	Johannesburg Stock Exchange
Turky	Borsa Istambul
China	China Securities Index
India	Bombay Stock Exchange
Indonesia	Indonesia Stock Exchange
South Korea	Korea Exchange
Malaysia	Bursa Malaysia
Philipina	Philippine Stock Exchange
Thailand	The Stock Exchange of Thailand

Research Methods

The method used is based on the research of Agrawal (2017) and Kleimeier (2008) to test Interdependence starting from unit root tests such as Augmented Dickey Fuller (ADF) test and Johansen cointegration. Contagion testing uses fisher test.Cointegration test is a long-term relationship on variables that are not stationary but linear combination between these variables can be stationary. According to Enders (2009), this analysis begins with a long-term relationship as follows:

$$\beta!x!+\beta!x!! +\cdots+\beta!x!" =0$$

This cointegration is based on the VAR model which is then converted to VECM. The VAR model is generally written in the equations as follows:

$$Y! =A!Y!!!+A!Y!!!+\cdots+A!Y!!!+\varepsilon!$$

VECM is the form of VAR which is restricted where restrictions are given because data is not stationary but is cointegrated. Following are the equations of VECM:

$$\Delta Y! =\delta+\Gamma\Delta Y!!!+\cdots+\Gamma!\Delta Y!!!+\Pi Y!!!+\varepsilon!$$

The VAR model above is then converted to VECM (vector error correction model) and there are two statistical tests, namely trace statistic and maximum eigen value statistic. In calculating stock returns, based on Forbes and Rigobon (2002) and Corsetti et al (2005) used simple equations namely:

$$r_{!,!} = \beta r_{!,!} + \varepsilon_!$$

Where j is the country of origin of the crisis and i is the country affected by the crisis. In this equation the change in return is affected by which is contagion which is characterized by correlation. However, the use of correlation according to Forbes and Rigobon (2002) causes excessive bias or estimation where contagion states that there should not be contagion occur. Then this correlation is then corrected to be:

$$\rho_i^* = \frac{\rho_i}{\sqrt{1 + \delta[1 - (\rho_i)^2}}$$

Where is

$$\delta = \frac{\sigma_!^!}{\sigma_{!!}} - 1$$

$\sigma_!^!$ is variety in high volatility in the country of origin and $\sigma_!^!$ is variety in low volatility in the country of origin. According to Corsetti et al (2005), the alignment test between two correlation coefficients can use Fisher Z transformation:

$$z(\bar{\rho}_!) = \frac{1}{2}\ln\left(\frac{1+\rho^!}{1-\rho_!}\right)$$

RESULTS AND DISCUSSION

Integration of Developing and Developing Country Stock Markets

International stock diversification to reduce systematic risk as shown in the figure below which is tested using johansen cointegration shows that international diversification does not have to be disseminated in many countries because the more countries chosen, the more integrated the stock market .. According to Solnik (1995), diversification more stocks don't have a big influence because the stock price moves together. As is known if investment companies only invest domestically then only unsystematic risk will decrease so that more or less will be in the range of 45%. If the risk is a systematic risk, the decrease will be 11.7%. Based on the picture below by diversifying 20 stocks on the international stock market, it will be able to maximize unsystematic risk and systematic risk.

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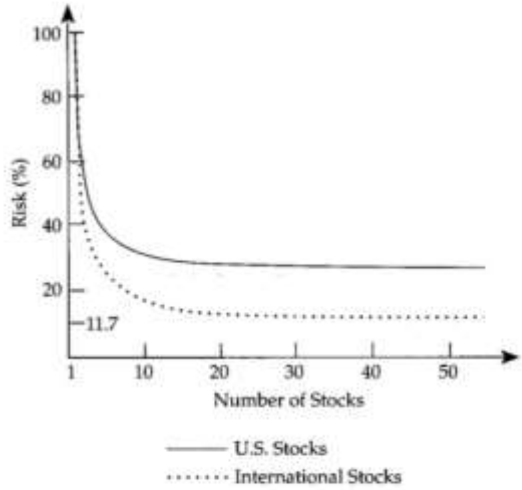

Figure 2. International Diversification

Source: Solnik (1995)

This johansen cointegration test is to see how many countries can be diversified in each grouping. The following are presented by johansen cointegration in developed countries.

Table 2 Intercept Cointegration or Trend in Advanced Countries

Hipotesis	Trace Statistic	Max-Eigen Statistic
None	2477.047	611.039
At most 1	1866.008*	473.402*
At most 2	1392.606*	312.706*
At most 3	1079.899*	240.740*
At most 4	839.158*	189.543*
At most 5	649.614*	160.226*
At most 6	489.388*	149.205*
At most 7	340.185*	106.335*
At most 8	233.846*	83.076*
At most 9	150.770*	74.942*
At most 10	75.828*	38.696*
At most 11	37.131*	36.456*
At most 12	0.675	0.6752

*Information = * is significant at the level of 5%*
Source = data processed from CEIC

Based on the table above it can be stated that the accepted hypothesis is at most 1-11 on the trace statistic and max eigen which means that H1 is accepted at r = 1-11. H1 acceptance is there are integration in 2 to 12 developed countries so it is better to do diversification in 13 stock markets because the combination of 13 stock markets is not integrated.

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These results indicate that the more countries included in the stock market combination, the less integration will be. The reason is that cooperation between countries in a small number will have higher integration than many countries in the country. Bilateral cooperation will have higher integration than multilateral.

Table 3 Intercept Cointegration and Trend in Developing Countries

Hipotesis	Trace Statistic	Max-Eigen Statistic
None	2681.613	581.106
At most 1	2100.506*	476.114*
At most 2	1624.392*	356.319*
At most 3	1268.073*	303.389*
At most 4	964.684*	245.335*
At most 5	719.349*	190.965*
At most 6	528.384*	150.660*
At most 7	377.723*	140.589*
At most 8	237.133*	124.884*
At most 9	112.249*	53.263*
At most 10	58.985*	41.334*
At most 11	17.651	15.792
At most 12	1.859	1.859

*Information = * is significant at the level of 5%*
Source = data processed from CEIC and Yahoo Finance

Based on the table above, cointegration intercept in developing countries is H1, namely r = 1-10 for trace statistics and r = 1-10 for max eigen statistics. Based on these results it can be stated that developing countries have integration in 1-10 countries for trace statistics and 1-10 countries for max eigen statistics so that diversification can be carried out in 12-13 countries For the stock market of developing countries a diversified combination chosen from 12-13 countries. Diversification starts in smaller countries, starting from 12-13 while in developed countries 13. The freedom to put funds in developing countries is an attractive factor compared to developed countries because in developing countries it can diversify in small amounts.

Interdependence and Contagion of the Stock Market in the Global Crisis

Interdependence and contagion in the Global crisis were tested using Fisher Z transformation, followed by T-Statistics. The following are the results of testing.

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Table 4 Interdependence and Contagion of Advanced and Developing Country Stock Markets

Category	Pre-Crisis		Crisis		T-Stat	I/C
	ρ	σ	ρ	σ		
Advanced Country						
Swiss	0.7176	1848.96	0.7137	1144.28	-0.034	I
Swedia	0.6815	1443.76	0.6080	2401.48	-0.525	I
Austria	0.7842	147634.8	0.4605	236172.09	-2.325	I
Norwegia	0.9322	3464.67	0.9484	5314.19	0.587	I
Kanada	0.8224	879547.2	0.7922	2130762.9	0.587	I
Belgia	0.7397	103478.8	0.6393	96074.57	-0.361	I
Denmark	0.9030	2149.87	0.8495	3093.42	-0.803	I
Finlandia	0.9481	1457165.9	0.5028	938640.74	-0.974	I
Perancis	0.7695	159478.95	0.5404	158481.79	-1.724	I
German	0.9651	688088.36	0.8954	847567.02	-2.362	I
Irlandia	0.3683	1164479.83	0.8660	266491.72	3.873	C
Spanyol	0.9231	1957904.56	0.0503	83975630	-6.492	I
Emerging Country						
Brazil	0.8299	131666388	0.5044	44018043.4	-2.634	I
Mexico	0.8025	23129961.5	0.5925	44018043.4	-1.765	I
Qatar	-0.0930	2430759.37	0.8578	1852258.84	5.738	C
Rusia	0.6864	83109.35	0.7454	157114.16	0.506	I
Afrika Selatan	0.7553	16419772.9	0.7459	25042921.6	-0.090	I
Turki	0.3761	37984124.3	0.3628	196513692	-0.064	I
Cina	0.9852	2599078.93	0.2561	215010.36	-9.108	I
India	0.8080	8841046.5	0.5651	9154813.73	-2.002	I
Indonesia	0.5591	261853.16	0.4453	926063.33	-0.636	I
Korea Selatan	0.7814	59046.49	0.7210	87379.19	0.579	I
Malaysia	0.8063	36372.48	0.6135	60646.53	-1.673	I
Filipina	0.7735	283517.61	0.3778	1289923.82	-2.629	I
Thailand	0.1404	5152.36	0.2734	73437.50	0.579	I

Source: Data processed from CEIC

When the crisis should be placed in the country affected by interdependence compared to the country affected by contagion because the risk in the country affected by interdependence is smaller than the country affected by contagion. Based on the table above, it can be seen that the correlation of countries affected by contagion is higher than that of interdependent countries. In addition, almost all types of data at the time of the crisis are smaller than when the stable conditions that produce variants according to forbes and rigobons have negative values in all countries which can be seen in the appendix.

Contagion occurs in Ireland for developed countries and Qatar for developing countries. As mentioned earlier that contagion is not caused by macroeconomic factors so that geographical

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influence is certainly not a fundamental cause of why contagion in Ireland and Qatar occurs. Both countries have increased correlation in times of crisis compared to countries that have only experienced interdependence.

Contagion can be likened to a virus that spreads. In terms of investment companies, this can be caused from shock caused by the funds being transferred in large quantities from one stock market to another. The transfer of funds is caused by changes in investor perceptions of a stock market that has the same economic conditions. Investment companies' perception in the form of investor behavior following other investment companies because of the panic in the stock market is something that should be noted especially why contagion occurs in Ireland and Qatar.

DISCUSSION

The results show that more and more countries are included in the combination of the stock market will be further reduced integration. The reason is that cooperation between countries in a small number will have higher integration than many countries in the country. Bilateral cooperation will have a higher integration than multilateral. For example cooperation between the United States and Canada will be more integrated than UN cooperation or EU cooperation.

Investment companies who are interested in emerging markets in the author's observation of the global crisis have caused investment companies to glance at emerging market stock markets Developing countries provide high returns a few years after the global crisis even though developing country returns are more volatile than developed countries. But that does not mean that developed countries are not attractive, except that in this condition the stock market returns of developing countries are more attractive than developed countries. Developing countries can be considered by investment companies if there are conditions that are not good in developed countries.

Table 5. Comparison of annual returns Developed and developing country stock markets 2006-2016

Year	Advanced Country	Developing Country
2012	16.54	18.63
2011	-5.02	-18.17
2010	12.34	19.20
2009	30.79	79.02
2008	-40.33	-53.18
2007	9.57	39.82
2006	20.65	32.55
2005	10.02	34.54
2004	15.25	25.95
2003	33.76	56.28
Rata-rata	10.36	23.46

Source: MSCI

In addition, there may also be an assumption that developing countries are still not integrated as is the case in developed countries so that many investment companies are interested in the stock markets of developing countries. Macroeconomic factors that also support investment

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companies to pay attention to developing country stock markets as seen in developing country GDP compared to developed countries below.

Although according to MSCI, developing countries still do not have sustainable economic development as happened in developed countries due to various factors. According to Iqbal (2011), one of the reasons for this is because state governance is not as good as democracy. But this can be caused by different forms of state. According to Acemoglu (2011), one of the causes of countries not developing and even being poor is that the country is not inclusive, which means that it does not include everyone in improving the country's economy. As a result, developing countries are more at risk than developed countries.

Volatile stock markets can be caused by too much ownership of shares by foreign investment companies so that the stock market moves foreign investment companies. Stock market of developing countries depends too much on foreign investment companies who can withdraw money from a stock market at any time. Therefore, if there is the world problems, it will affect the domestic stock market. The habit of investment companies who do herding can also cause the stock market to be unstable.

For companies that operate internationally cause one country to deal with another country , therefore GDP (gross domestic product) of a country is only one factor that influences the stock market because if a company operates globally then GDP in various countries is a factor not just one country but what needs to be considered is world GDP. Based on MSCI , GNI (gross nation income) is one of the factors that influence whether the country is a developed country or not. If the company is a blue chip that operates globally or has a market in another country so that it can move the stock market, according to the authors, sustainable economic development is not an important factor. In contrast to companies whose markets are in the country, the sustainable economic development in a country is one of the important factors.

Terms of liquidity and market access are things that are important to consider in determining the stock market in which conditions. Because if the stock market is illiquid then there is no transaction which results in not knowing whether the stock will go up or down or just be used as a game for traders who want to gain profit from the anomaly market. The existence of capital restriction in the stock market can affect the process of stock market integration longer because there are differences in the level of risk, expected return and distortion of domestic stock prices to international stock prices, thus providing opportunities for foreign investment companies to benefit from stock diversification (Howlett, 2012) Market access is important.

The results of this study indicate that the interdependence between the United States and 26 countries are divided into developed countries and developing countries with more interdependence than contagion during the United States crisis.

It appears that the crisis in the United States was not too large. The reason is that this research method has been refined to avoid bias so that contagion events do not occur much. When the crisis should put the funds in the countries affected by the interdependence than in countries hit by contagion because of the risk on the interdependence of countries affected is smaller than countries hit by contagion. Based on the table above, it can be seen that the correlation of countries affected by contagion is higher than that of interdependent countries. In addition, almost all types of data at the time of the crisis are smaller than when the stable conditions that produce variants according to forbes and rigobons have negative values in all countries which can be seen in the appendix .

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Interdependence is very much influenced by macroeconomic factors. Contagion is not caused by macroeconomic factors because it spreads out, especially in times of crisis. The impact of interdependence and contagion can be seen from GDP, FDI, the exchange of means of production factors (eg labor, technology, or capital), exports and imports which result in a decrease in certain company revenues and debt.

Contagion occurs in Ireland for developed countries and Qatar for developing countries. As mentioned earlier that contagion is not caused by macroeconomic factors so that geographical influence is certainly not a fundamental cause of why contagion in Ireland and Qatar occurs. Both countries have increased correlation in times of crisis compared to countries that have only experienced interdependence. Impact of contagion for investment companies can reflect from money that moves from stock market to another stock market. The transfer of funds is caused by changes in investment companies perceptions of a stock market that has the same economic conditions. Investment companies' perception in the form of investor behavior following other investment companies because of the panic in the stock market is something that should be noted especially why contagion occurs in Ireland and Qatar.

Managerial Implications

For investment companies who want to diversify their shares in the international stock market, they can place them in the stock market of developing countries if they want fewer countries. As is known from the results of the number of selected stock markets for developed countries are 12 stock markets and in developing countries 12 and 13. This international diversification can be useful to reduce risks that cannot be overcome if they are diversified in the country alone. Domestic risk is the risk of unsystematic risk reduction by diversifying its shares in different industries. If diversifying stocks abroad can reduce systematic risks such as macroeconomic problems.

Based on contagion research can occur in the country of Ireland and the State of Qatar. This shows that geographical factors are not the cause of contagion. The reason is the investor's perception of the behavior of investment companies following other investment companies because panic in the stock market is worth noting especially why contagion occurs in Ireland and Qatar. Fund placement should be in countries that experience interdependence.

CONCLUSION AND SUGGESTIONS CONCLUSION

Based on this study, it can be concluded that the total number of selected stock markets for developed countries is 13 and developing countries are 12 and 13. This shows that more and more countries are not integrated into the country. The reason is that the more cooperation between countries, the more intricate integration between countries. This disintegration can be used by investment companies to invest safely abroad because integrating abroad can reduce systematic risk if the company only invest locally.

Contagion in the United States crisis occurred in Irlandi and Qatar. shock caused by funds being transferred in large quantities from one stock market to another. The transfer of funds is caused by changes in investor perceptions of a stock market that has the same economic conditions. Investment companies' perception in the form of investor behavior following other investment companies because of the panic in the stock market is something that should be noted especially why contagion occurs in Ireland and Qatar.

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Suggestions

The integration of stock markets using johansen cointegration in this study has the disadvantage that this study cannot determine which portfolio is right. For example, there are integration in 4 countries, it is recommended to choose 3 countries. But if this johansen cointegration can determine which countries are included in the 4 countries. Therefore choosing 4 countries is not a problem if the selected country combination is another country where the johansen cointegration is rejected. For further research it is recommended to form a stock market portfolio in the selected country.

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