

## The Effect of Economic Crisis Indicators on The Performance of Conventional and Islamic Capital Markets in Indonesia; A Comparative Analysis

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### Abstract

*The objective of this research is to analyze the different effects of economic crisis indicators on the performance of conventional and Islamic capital markets in Indonesia and the stability of both capital markets during shocks using Vector Error Correction Model (VECM). Monthly time-series data from 2015 to 2019 were used, the variables are inflation, interest rate, SIBOR, developed countries' economic growth, foreign exchange reserves, and world oil prices. This study finds that, in the long run, inflation affects the performance of the capital markets and that the economic growth of developed countries influences conventional capital markets. In the short run, foreign exchange reserves influence both capital markets, and the economic growth of developed countries affects Islamic capital market. Significant differences in stability due to shocks were not found in both markets if observed using IRF test and variance decomposition. If later on shocks in economic crisis indicators that can refer to the occurrence of crises were to be found, the stability of both capital markets would be affected.*

**Keywords:** Crisis Indicators, VECM, IHSG, ISSI

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### 1. INTRODUCTION

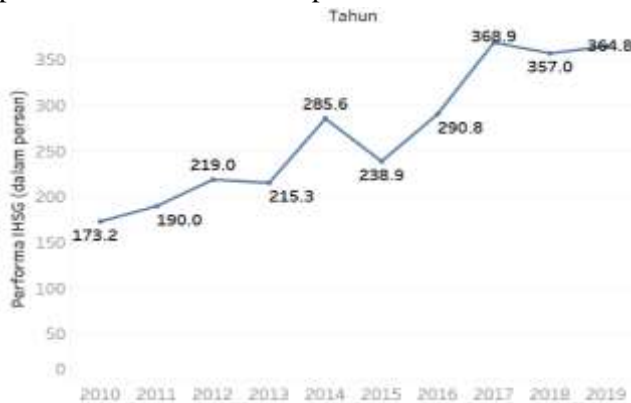
In the era that supports globalization, countries have become more dependent to each other, urging the world's economy to unite (Aditya et al., 2018), as borders between them gradually disappear. Globalization also enhances the development of the financial sector. In this case, the world's economy is limitless, and financial system development causes international contagious effects. The positive impact of globalization, on the one hand, is a global trade market, in which every country can participate in international trade such as export and import. On the other hand, globalization causes, of which, global crises, such as the 1997 monetary crisis and the 2008 global crisis due to non-performing credits in the US, due to dependency on intercountry economic activities. The soundness of the economy is linked with stability in the financial system (Crockett, 2020; Nezky, 2013) because the financial sector is still used as the benchmark of a country's economic growth. According to the Indonesia Stock Exchange, the capital market is crucial for the economy as it has two

functions: the infrastructure for the company's business funding and the place for public investment. Capital markets are media for investment, one of the pillars of national development. The price of the products in capital market is the consideration of investors. The dynamic of its indices serves as the indicators for market trend as it describes market situation during the highs and the lows. Stock indices are influenced by crises. One of the examples is the 2008 crisis, when IHSG (IDX composite) was greatly corrected to 1,335 from the 2007's 2,746 as seen in Figure 1.



**Figure 1. IHSG from 2007 to 2019 (Indonesia Stock Exchange; Yahoo Finance, 2020)**

Capital market in Indonesia is developing rapidly as the market is used as one of the alternative mediums for investment aside from saving money in banks, buying houses, investing in gold, etc. Nowadays, investing in capital market is favorable, particularly after seeing the high increase of IHSG from 2010 until 2019 where the accumulation of gains from the stock market performance doubled in 2019. Figure 2 depicts the performance of Indonesian capital market, represented by IHSG performance, which was 173.2 percent in 2009 and 364.8 percent in 2019.



**Figure 2. Performance of the Indonesian Capital Market in the Period of 2009-2019 (Indonesia Stock Exchange, 2020)**

The development of a capital market encourages investment, which later increases capital accumulation in the country and finally improves national economy (Afrizal & Farlian, 2017). The capital market is divided into two: conventional and Islamic, both are included as affected indicators during crises. This is related to the fact that the capital market in a country is difficult to avoid international influence which leads to cointegrations and interdependencies between markets (Setyastuti, 2007). An economic crisis in a country may be caused by either internal or external factors (Fischer, 1997, in Oktavilia, 2008). The internal factors are caused by the macro condition of the country, while the external factors are caused by

globalization, the catalyst of crisis contagion in current era. The description above has attracted the researcher to compare the effect of economic crisis indicators in both capital markets and to determine which market is more stable under disturbance.

## 2. RESEARCH METHOD

This study uses a quantitative approach with secondary data in the forms time-series data obtained from the website of Bank Indonesia, Financial Services Authority, and Indonesia Stock Exchange and several foreign sources such as Bureau of Economic Analysis (BEA), DBS Bank, investing.com, and sibor.sg. The data are monthly from 2015 to 2019. The focus of this research is identifying the relationship between economic crisis indicators and the performance of the Indonesian capital market, both conventional and Islamic, and comparing the effect of the indicators on both markets. VAR/VECM was used to predict related data and to observe whether or not long and short-run relationships are present.

Data collected by the literature study method and then analyzed with estimates. The analysis starts with stationarity test, followed by cointegration test, optimal lag test, VECM test, IRF test, and variance decomposition test. The comparison focuses on the results of Impulse Response Function and variance decomposition tests.

## 3. RESULT AND DISCUSSION

### 3.1. Result

#### Stationarity Test

In this research, the stationarity test uses Augmented Dicky Fuller (ADF) test. The hypotheses of the test are  $H_0: p = 1$  (non-stationary unit) and  $H_1: p < 1$  (stationary). If the ADF probability is higher than 0,05 or 5%, the variable is said to be stationary, and vice versa.

**Table 1. Stationary Test on Conventional and Islamic Capital Markets**

Conventional Capital Market			Islamic Capital Market		
Variable	Prob. ADF		Variable	Prob. ADF	
	Level	1 <sup>st</sup> diff.		Level	1 <sup>st</sup> diff.
IHSG	0,7942	0,0000	ISSI	0,6624	0,0000
Foreign Exchange	0,8077	0,0000	Foreign Exchange	0,8077	0,0000
Reserves			Reserves		
World Oil Price	0,2712	0,0000	World Oil Price	0,2712	0,0000
SIBOR	0,7172	0,0000	SIBOR	0,7172	0,0000
Interest Rate	0,4163	0,0000	Interest Rate	0,4163	0,0000

Conventional Capital Market			Islamic Capital Market		
US' Economic Growth	0,0386	0,0000	US' Economic Growth	0,0386	0,0000
Inflation	0,0000	0,0000	Inflation	0,0000	0,0000

Source: EViews 9 Estimation Result (processed data)

The stationarity test results indicate that US' economic growth and inflation are stationary at level. Assessment on 1<sup>st</sup> difference followed, resulting in that all indicators are stationary at that level.

#### Optimal Lag Test

In this research, the optimal lag test uses the criteria from the model with the smallest values of Schwarz Information Criterion and Hannan Quinn Criterion. The results of the analysis suggest lag 1 for both capital markets.

**Table 2. Optimal Lag Length for Conventional Capital Market**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1983.363	NA	1.75e+22	71.08441	71.33758	71.18256
1	-1668.850	539.1662	1.36e+18*	61.60178	63.62713*	62.38701*
2	-1633.704	51.46303	2.41e+18	62.09658	65.89412	63.56888
3	-1575.537	70.63222*	2.16e+18	61.76917	67.33888	63.92853
4	-1519.482	54.05263	2.67e+18	61.51722*	68.85912	64.36366

Source: EViews 9 Estimation Result (processed data)

**Table 3. Optimal Lag Length for Islamic Capital Market**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1749.299	NA	1.29e+19	63.86543	64.12091	63.96422
1	-1449.605	512.2048	1.43e+15*	54.74927	56.79310*	55.53964*
2	-1405.607	63.99706	1.87e+15	54.93116	58.76335	56.41310
3	-1348.145	68.95490*	1.73e+15	54.62344	60.24397	56.79695
4	1289.871	55.09479	2.03e+15	54.28623*	61.69511	57.15130

Source: EViews 9 Estimation Result (processed data)

#### Cointegration Test

The cointegration test of this research uses the Johansen System Cointegration Test. The cointegration in the model will be indicated by the trace statistic values, whether or not they exceed their

critical value. The test conducted on both markets indicates that there are at least two cointegrated equations, in which the trace statistic value at most 1\* is higher than its critical value, as shown in table 4 and 5.

**Table 4. Cointegration Test on Conventional Capital Market**

Hypothesized No. Of CE(s)	Probability	Trace Statistic	0.05 critical values
None *	0.566918	147.4661	125.6154
At most 1 *	0.456363	98.93006	95.75366
At most 2	0.360760	63.58061	69.81889
At most 3	0.320583	37.62702	47.85613
At most 4	0.128338	15.20883	29.79707
At most 5	0.085630	7.242312	15.49471
At most 6	0.034730	2.050161	3.841466

Source: EViews 9 Estimation Result (processed data)

**Table 5. Cointegration Test on Islamic Capital Market**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.587128	154.6083	125.6154	0.0003
At most 1 *	0.520825	103.3004	95.75366	0.0137
At most 2	0.336535	60.63047	69.81889	0.2165
At most 3	0.313596	36.83428	47.85613	0.3554
At most 4	0.135258	15.00955	29.79707	0.7795
At most 5	0.082913	6.580731	15.49471	0.6268
At most 6	0.026549	1.560660	3.841466	0.2116

Source: EViews 9 Estimation Result (processed data)

### VECM Test

VECM test is used to indicate whether or not short-run and long-run relationships are present

between independent and dependent variables. This research hypothesizes that a significant effect is present if the t-statistic is higher than the t-table.

**Table 6. Long-Run VECM Test for Conventional Capital Market**

Conventional Capital Market Model (Long Run)			
Variable	T-statistic	T-Table	Remark
Foreign Exchange Reserves	[-0.94494]	2.00758	Insignificant
World Oil Price	[ 0.11860]		Insignificant
Inflation	[-6.86438]		Significant
United States Economic Growth	[ 2.26570]		Significant
SIBOR	[-0.80221]		Insignificant
Interest Rate	[ 0.49379]		Insignificant

Source: EViews 9 Estimation Result (processed data)

**Table 7. Long-Run VECM Test for Islamic Capital Market**

Islamic Capital Market Model (Long Run)			
Variable	T-Statistic	T-Table	Remark
ISSI	-	2.00758	-
Foreign Exchange Reserves	[-1.07989]		Insignificant
World Oil Price	[0.99872]		Insignificant
Inflation	[-7.26719]		Significant
Interest Rate	[0.69038]		Insignificant
SIBOR	[-0.90248]		Insignificant
US' Economic Growth	[1.88938]		Insignificant

Source: EViews 9 Estimation Result (processed data)

The long-run test results indicate that, in conventional capital market, inflation and world oil price are the only variables having significant effect on Indonesian conventional capital market and that, in

the Islamic capital market, inflation is the only variable significantly affecting the Indonesian Islamic capital market.

**Table 8. Short-Run VECM Test for Islamic Capital Market**

Islamic Capital Market Model (Short Run)			
Variable	T-Statistic	T-Table	Remark
D (ISSI(-1))	[-1.54082]	2.00758	Insignificant
D (Foreign Exchange Reserves(-1))	[2.68316]		Significant
D (World Oil Price (-1))	[-0.46232]		Insignificant
D (Inflation(-1))	[-0.47460]		Insignificant
D (Interest Rate (-1))	[0.32412]		Insignificant
D (SIBOR(-1))	[0.45244]		Insignificant
D (US' Economic Growth(-1))	[2.21288]		Significant
Cointq	[-1.03984]		Insignificant

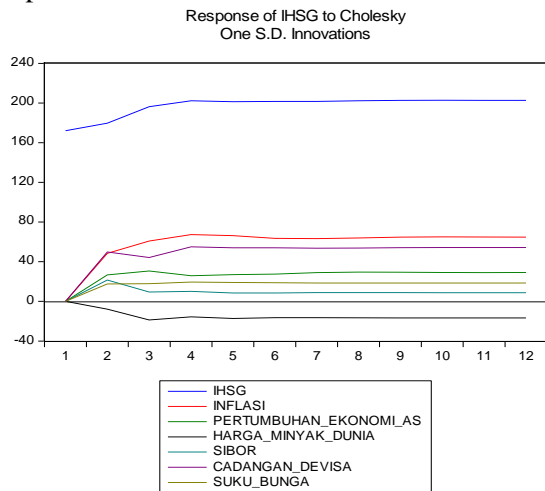
Source: EViews 9 Estimation Result (processed data)

**Table 9. Short-Run VECM Test for Conventional Capital Market**

Conventional Capital Market Model (Short Run)			
Variable	T-statistic	T-Table	Remark
D(IHSG(-1))	-1.28085	2.00758	Insignificant
D(Foreign Exchange Reserves(-1))	2.23454		Significant
D(World Oil Price (-1))	-0.65809		Insignificant
D(Inflation(-1))	0.73212		Insignificant
D(Interest Rate (-1))	0.77249		Insignificant
D(SIBOR(-1))	0.83883		Insignificant
D(US' Economic Growth(-1))	1.79052		Insignificant
CointEq1	-0.023816		Insignificant

Source: EViews 9 Estimation Result (processed data)

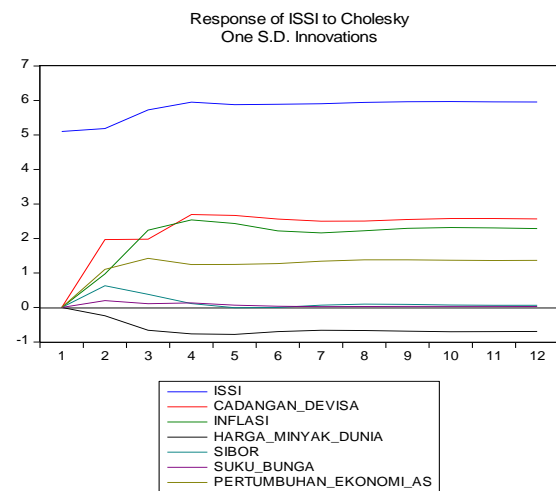
In the short run, foreign exchange reserves significantly affect the performance of both Islamic and conventional capital markets. In the Islamic capital market, the economic growth of a developed country (the US), significantly affects its performance. Other indicators do not significantly influence the performance of both markets. In addition, in the short run, there is no adjustment from the short to long run, as seen from the error correction term parameters in both capital markets.



**Figure 3. IRF Test on Conventional Model**  
(processed secondary data, 2021)

### Impulse Reaction Function Test

The results of the IRF test conducted on both capital markets, as seen in Figures 3 and 4, indicate that any shock in inflation, interest rate, SIBOR, foreign exchange reserves, and US economic growth will be followed by positive responses in IHS and ISSI. Nevertheless, any shock in world oil price will be followed by negative responses in IHS and ISSI before moving towards stability.



**Figure 4. IRF test on Islamic Model**  
(processed secondary data, 2021)

### Variance Decomposition

Variance Decomposition test was used to describe the composition of how big the influence of a certain variable is as compared to other variables. In the case of conventional capital market, it is explained that in the first period IHS is only affected by IHS, i.e. 100%. In the second period, the most influential factors are IHS (90.66982), world oil price (3.869139%), and US' economic growth (2.193344%). Finally, in the twelfth period, the contribution of IHS decreases to 83.63453%, entailed by the increasing contributions of other variables such as the world oil price (5.990055%), US' economic growth (5.113147%), followed by SIBOR, foreign exchange reserves, and interest rate.

In the case of Islamic capital market, ISSI in the first period is only affected by ISSI (100%). The following periods witness the increasing influence of the economic crisis indicators, along with the gradually visible composition. The dominant indicators are foreign exchange reserves (6.5%), US' economic growth (2.5%), and inflation (1.4%). The changes of percentage of distribution continue until the twelfth period, where the contribution of foreign exchange reserves reached 12.40% and inflation reached 8.69%. At that period, the composition of ISSI decreases to 73% from its initial 100% in the first period.

**Table 10. Variance Decomposition Result for Conventional Model**

Period	S.E.	IHS	FOREIGN EXCHANGE RESERVES	WORLD OIL PRICE	INFLATION	US' ECONOMIC GROWTH	SIBOR	INTERES T RATE
1	172.1065	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
4	405.0605	86.17537	1.072142	4.962626	0.617732	4.232904	2.663095	2.663095
8	600.8518	84.24979	1.305671	5.757634	0.669858	4.897026	0.161743	2.958277
12	748.4396	83.63453	1.370091	5.990055	0.678156	5.113147	0.127998	3.086022

Source: EViews 9 Estimation Result (processed data)

Period	S.E.	ISSI	FOREIGN EXCHANGE RESERVES	WORLD OIL PRICE	INFLATION	US' ECONOMIC GROWTH	SIBOR	INTEREST RATE
1	5.103962	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
4	12.45783	78.02688	9.749631	1.652008	7.067837	3.375311	0.084577	0.043761
8	18.71329	74.28569	11.86083	2.029121	8.293849	3.373747	0.135472	0.021285
12	23.43507	73.16238	12.40069	2.119507	8.694465	3.466389	0.142303	0.014266

**Table 11. Variance Decomposition Result for Islamic Model**

*Source: EViews 9 Estimation Result (processed data)*

### 3.2. Discussion

#### **The Effect of Economic Crisis Indicators on Conventional Capital Market**

In the long run, inflation significantly affects IHSG, but other crisis indicators do not. This finding related to inflation is relevant with the finding of Pahlevi (2019) that inflation is sensitive to IHSG and is supported by the relationship explained by Tandelilin (2017) that changes in inflation can redirect investor's intention from investment due to changes in money's purchasing power and real income received by the public, particularly investor, should changes take place in the long run.

United States' economic growth significantly influences capital market. The good economic growth in the US influences the stock markets in the country, which will also affect stock or capital market in Indonesia due to integrity in world's markets and due to the tendency that the markets of developed countries influence those of developing ones (Mansur, 2015, in Aditya et al., 2018). In the short run, foreign exchange reserves significantly affect capital markets. The reserves signal investors that the country's financial condition is stable. This finding is relevant with the finding of Zakaria et al. (2018) that foreign exchange reserves affect capital market, in this case IHSG, as it has been previously explained that foreign exchange reserves are related with balance of payments. Any surplus in balance of payments will attract investments, which finally increase stock price and trade volume in domestic capital markets (Zakaria et al., 2018).

Other indicators, i.e. interest rate, SIBOR, US' economic growth, and world oil price, do not significantly affect IHSG in both short and long run, this contradicts the finding of Aditya et al. (2018) that BI Rate has a significant and negative effect on IHSG because, if interest rate – in this case BI Rate – increases, investors tend to move or transfer their fund to savings or deposits. This study finds that changes in interest rate do not cause any significant changes in

capital market, particularly IHSG. This signifies that any increase in interest rate does not influence the increase of production cost that eventually affects company's profitability, stock price, and the performance of capital, particularly stock, market. This finding is relevant with the finding of Ningsih & Waspada (2018) that interest rate does not influence IHSG. The finding about world oil price is relevant with the finding of Raraga et al. (2012) that world oil price does not significantly influence IHSG in both long and short run.

#### **The Effect of Economic Crisis Indicators on Islamic Capital Market**

In the long run, only does influence significantly influence ISSI, which is similar to the finding of Firdausi et al. (2016) that inflation significantly affects ISSI. According to Islamic economics, inflation has an adverse effect on economy as it disturbs the function of money as value keepers, increases consumptive nature, and makes individuals invest in non-productive matters such as land (Al-Masri, 2008, in Antonio et al., 2013). In the short run, foreign exchange reserves and US' economic growth are quite influential for Islamic capital market, which is represented by ISSI. As in conventional capital market, investors are interested more to invest in countries with sound and stable economy. this is because foreign exchange reserves are one of the pillars for external sector security, not to mention that they protect the macroeconomic stability of a country and its monetary system.

The increasing growth of US' economy also influences the performance of Indonesian Islamic capital market. According to Hsing (2011), US' GDP positively influences the country's capital markets, which influence Indonesian capital market. This is relevant with the finding of Mansur (2005) that integrity in the world's market and the tendency of developed countries' markets influences the markets of developing countries (Aditya et al., 2018). This is supported by Wibowo (2019) with the finding that

Dow Jones Index positively influences Islamic capital market, which is represented by ISSI.

Other variables, i.e. interest rate (BI Rate), SIBOR, and world oil price, do not affect Islamic capital market in both short and long run. This is relevant with the finding of Suciningtias & Khoiroh (2015)) that world oil price does not influence ISSI, in which changes in world oil price do not make investors change their mind in terms of investment. Regarding interest rate, this study finds different result from Firdausi et al. (2016) and Widyasa & Worokinasih (2018). As two other studies mention that ISSI or Islamic capital market is affected in that the performance of Islamic capital market decreases as investors tend to transfer their fund to deposits and saving, this research finds that investors tend to be irresponsive with changes in interest rate. ISSI is a sharia-compliant stock market, whereas interest rate is an economic crisis indicator that is not based on sharia principles.

#### **Analyses on the Responses of Conventional and Islamic Capital Markets and Comparisons of Their Stability**

Observing only on the responses of both capital markets to any shocks in economic crisis indicators, both IHSG and ISSI reacted from the first to the third or the fourth month or period after the shock. When inflation was shocked, IHSG and ISSI responded to it positively before going toward stability. This means that, should inflation increase, conventional and Islamic capital markets will increase. This response might be caused by the fact that inflation in Indonesia is well controlled, so investors are not very much concerned. In addition, it may also be caused by the government's capability to anticipate price increase due to better economy following the crisis (Masyami et al., 2014, in Antonio et al., 2013).

Both conventional and Islamic capital markets negatively responded to the shock in world oil price. This means that any increase in world oil price will be responded negatively by the markets; both markets will experience a decline due to the shock. For oil-importing countries, the increase of oil price will increase their domestic oil price due to higher import cost, as happened in Indonesia. Any shock in interest rate will be positively responded by conventional capital market. The finding of this research varies from the finding of Tandelilin (2017) that a decrease in interest rate, in fact, increases public interest in

capital market instruments as they expect more return from capital market. People will finally change from savings, particularly deposits, during the decline in interest rate. In addition, it may also be caused by any addition of production cost in certain companies can be absorbed by selling price to consumers so that there are no significant changes in company's profit and dividend payment as well as stock price. This also applies to Islamic capital market, which in certain point gives a positive response, although insignificant, and tends to be stable despite shocks or changes in interest rate. Islamic capital market also positively responds to shocks in interest rate; an increase in interest rate is followed by an increase in ISSI.

This finding contradicts the finding of Firdausi et al. (2016) that Islamic capital markets negatively responds to shocks in interest rate. Similar to interest rate, when SIBOR is shocked, both IHSG and ISSI will respond positively only at the initial stage and will be stable in the next stage. The positive response after a shock in interest rate in the capital markets occurs when both investors and companies have anticipated the signals for interest rate increase. This means that, if SIBOR interest rate increases, both conventional and Islamic capital markets will experience an increase. This signifies that, despite the increase in international interest rate, capital flow into the country will also increase, which means that investors do not relocate their fund to foreign investment or foreign securities. This finding is different from the finding of Syafrudin (1994) that the parity of interest rate also influences the capital flow of a country, in which when the foreign interest rate is higher than the domestic one, it is likely that more of the capitals will flow to foreign countries.

Any shocks in US' economic growth and foreign exchange reserves are responded positively by both IHSG and ISSI at the beginning of the period, but the responses slightly decrease afterwards, and stability will commence in the eight month or period. Foreign exchange reserves are positively responded by both IHSG and ISSI, similar to the findings of Zakaria et al. (2018) and Oktarina (2016). This shows that the changes, e.g. an increase in foreign exchange reserves, will be responded positively by the capital markets. The reserves are the illustration of the economic strength of a country, especially its stability, and stability attracts more investors. In terms of US' economic growth, the improving economy of the country is observable from its economic growth,



which influences Indonesia's economic growth due to capital flow from the US to Indonesia either directly or through capital market. The incoming flow of fund through capital markets improves the performance of Indonesian capital markets from the addition of volume of trade that influences stock price.

The contribution of world oil price to conventional capital market, particularly IHSG, is negative at 1.37% in the twelfth period, and the contribution of other variables is 14.99%. World oil price has a negative effect on Islamic capital market at 2.11%, and the other economic crisis indicators contributes 24.71%. Based on the comparison between both Indonesian capital markets' reaction, we can see that IHSG has a more stable responses to shocks in the indicators, although the difference is not considerable. When ISSI is still fluctuating during the middle periods, IHSG tends to be more stable. However, observed from each of the crisis indicator, Islamic capital market is not very much affected by shocks in interest rate and SIBOR. This may occur because in conventional capital market there are stocks from conventional banking sector that contributes much to the stability of conventional capital market in Indonesia.

#### 4. CONCLUSION

Observing the comparison between the effect of economic crisis indicators on conventional capital market and those on Islamic capital market in the long run, inflation has similar effect on both markets. Changes in inflation can replace investors' willingness to invest due to changes in moneys; purchasing power and real income to be gained by the public as investors. However, there are differences between the two markets. The performance of conventional capital market is affected by US' economic growth. Variations in the country's economic growth give different effect on the country's stock market, and, in fact, the country's stock market influences other countries' stock markets, especially those of developing countries. Other indicators, i.e. SIBOR, interest rate, world oil price, and foreign exchange reserves, do not have any significant effect in the long run.

In the short run, foreign exchange reserves significantly affect both capital markets. Strong balance of payments attracts more investors to invest in Indonesia, which eventually can influence Indonesian capital markets. In Islamic capital market,

US' economic growth is influential. As it is in the long run, US stock markets affect the stock markets of other countries, particularly those of developing countries. Meanwhile, other economic crisis indicators do not significantly influence both capital markets in the short run.

Indonesian conventional capital market has a more stable response than Indonesian Islamic capital market in reacting to shocks, but the difference is insignificant. The economic crisis indicators contribute 17% to conventional capital market and 27% to Islamic capital market, which means that Islamic capital market will be affected more by shocks, particularly in its performance stability. In terms of the effect of the shock, both conventional and Islamic capital markets only respond negatively to shocks in world oil price.

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