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How Influential the Market Confidence in Determining the Global Stock Returns

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ABSTRACT

Market confidence and investment behavior and decision are closely related. This study conducts an empirical analysis to examine how influential the market confidence (consumer and business levels) in determining the performance of global stock returns. Specifically, the study seeks to reveal if market confidence has asymmetric influences on stock return and how the effect changes across sectors. For the purpose of analysis, we utilize the nonlinear autoregressive distributed lags (NARDL) model by examining the ten sectoral global Morgan Stanley Capital International (MSCI) monthly data ranging from the year 1995 to 2016. Our results showed that both consumer and business confidences have asymmetric effects and their impacts are captured in both short-term and long-term. In particular, the impact of consumer confidence is relatively larger than that of business confidence and varied across sectors. The increase of business confidence leads to higher stock returns in the sector of energy, financials, health care, and utilities while the increase in consumer confidence improves the return of health care and real estate. On the other hand, the decrease of consumer confidence imposes a negative impact on the return of energy, financials, industry, and utilities. In general, the energy and industry sectors are more affected by market confidence while no long-run impact is found in communication services and information technology sectors.

Keywords: asymmetric effects, global stock return, market confidence

1 INTRODUCTION

Stock market performance is one of the indicators that may reflect the economic situation and development of a country as high trading volume and return in the stock market may stimulate economic activities and transaction, hence promoting economic growth. Previous literature has evident the crucial role played by the stock market activities in stimulating economic development/ growth through financial liquidity enhancement, cost of mobilizing savings reduction, the strength of corporate governance, and international risk-sharing facilitation [1], [2]. Due to its crucial role in economic performance, there are increasing and continuing studies conducted to study what are the main factors that may determine the performances of stock markets, both theoretically and empirically. These factors or determinants can be categorized into tradable (non-fundamental) versus macroeconomic factors (fundamental factors). The tradable factors can be hedged against exposure to risk factors as they are trading-volume-related factors. On the other hand, the fundamental factors are aggregate indicators that may explain the economic performance, structure,

behaviour, and decision. Many studies found interactions/ linkages between macroeconomic factors and stock performances in which macroeconomic factors may influence and can predict the stock returns for instance, [3], [4], [5]. However, there are inconclusive and debatable views theoretically in explaining the macro-stock performance relationship. This happens also in the empirical findings as results are inconclusive and subject to further research if the relationship is uni-directional or bi-directional. On the other hand, [6] classified the factors into three strands which include micro-based or models of asset pricing, macro-economic factors, and institutional factors. Based on the literature of existing studies, there are still inconclusive findings either theoretically or empirically as the suggested factors may not able to well explain the stock market movement in all markets and all periods. There are studies that suggested random walk models might explain better the stock price movements, where stock prices are unpredictable but follow a random pattern for instance, [7], [8], [9].

This study seeks to contribute to the previous literature on stock returns and deviates from previous studies by testing the behavior and confidence of the market (the consumer confidence and business confidence). This study contributes to the financial and stock market research in three ways. First, previous studies mainly examined the explanatory of stock returns based on a long-run relationship alone. This study analyzes the same topic in both short-run and long-run counterparts. Second, the majority of studies used aggregated stock indices data while the studies that applied the sectoral price indices data are very limited. This study uses the disaggregated data covering ten sectors. The results may provide additional information across sectors rather than the aggregated stock return. Third, previous studies mainly applied the linear regression approaches which limit the estimates to a static and linear relationship. This study applies a nonlinear autoregressive distribute lags model (NARDL) which enables estimations on the asymmetric effects of market confidences (consumer and business confidence) on the sectoral stock returns. The results are more accurate and informative compared to the linear regression. The results showed that both consumer and business confidences have asymmetric effects on the stock returns across sectors especially the necessity goods sectors. The impacts vary across sectors due to the specific features and sensitivity and linkages of the productions to the market demand. The confidence factor is the main and crucial factor that determines the stock performances while other macroeconomic factors only show a relatively small influence.

2 LITERATURE REVIEW

Previous studies have examined and suggested many factors which may influence the stock market performances. In terms of theoretical studies, some of the famous models include arbitrage pricing theory (APT) and the model of capital asset pricing (CAPM) in which APT is an alternative forecast or additional macroeconomic factors added on the CAPM model. The CAPM model proposed market risk-free rate and risk-premium as the explanatory factors to the expected return of an asset or a portfolio. Apart from the theoretical explanation on the stock market movement, there are two groups of views to predict the stock market price, the chartist and the fundamentalist. The chartist believed that historical stock prices may repeat, so that same historical patterns of price behavior may explain the current or future stock price's path. This hinges on the view to support the random walk theory, as prices may move randomly without a predictable path. In contrast, fundamentalists believed that the stock market is dominated by fundamental factors [10].

[6] classified the theoretical views on the determinants of stock performances into three main groups, which are micro-based theories; macroeconomic factors and institutional factors. According to the theories of asset pricing which are micro-based, the factors that impact the fundamental value of a stock or an asset may affect its price. The two main factors are market-related factors (for instances market uncertainty, stock liquidity, economic growth and exchange rate) and portfolio-related factors (for instances stock return rate, dividends or earnings and company size). The second group proposed the macroeconomic factors such as banking sector and economic development, exchange rate, inflation rate, trade openness, and so on. There are debatable theoretical views on the nexus of banking sector versus stock market performance. However, empirical results found that both variables are complementary in nature [11], [12], [13]. Other macro factors, economic development has a positive influence on the development of stock market as reported by theoretical and empirical analyses [11], [14], [15]. In terms of inflation, the theory predicts a negative relationship where high inflation is associated with lower stock liquidity and hence lower stock market development. This is proven by [15] for the case in South Africa. There are studies reported that the relationship is nonlinear [16], [17], [18]. The other factor is the exchange rate, with appreciation leads to a positive impact while depreciation leads to a negative effect on stock prices [19]. However, [20] claimed that the impact of exchange rates on stock returns can be positive or negative depending on different conditions and its results are inconclusive, for instances [21], [22]. Other studies such as [23] suggested the macroeconomic factor like trade openness might lead to a positive impact on the stock market development. Trade openness increases the demand for financial products in terms of risk and income volatility. Also, trade openness may foster stock market development by boosting the supply in the stock market [24]. However, [15] found a contrasting result, which is trade openness hindered the stock market development. Other studies, revealed that other macroeconomic factors covering interest rate, money growth, industrial production, and reserves are significant in explaining the stock market movement [3], [25], [26].

Then, the third group institutional factors as the factors contributing to stock market development. These factors include legacy of origin, protection legacy on investors, market liberalization and integration, corporate governance, and etc. The well-institutional system development enhances higher security system, investors legality and protection, hence encourages higher investment and market integration, and supports stock market development [12], [13], [27].

Apart from the factors or determinants discussed above, the judgment of investors and their prediction on the future situation may also influence the behavior and decision of investors, hence affect the stock price movements. More recently, researches focusing to examine the degree of optimism and confidence of consumers and businesses (consumer confidence index (CCI) and business confidence index (BCI)) may influence the stock market performances. CCI is usually used to explain and predict economic activity by comparing the current information content with their judgement, by considering the current or expected economic uncertainty ([28], [29]). The empirical findings propose that CCI is influential in affecting economic activities but the effect is only significant on certain variables. These variables include housing market indicators, durable and nondurable goods, manufacturing-related indicators and services-related indicators, they are sensitive to CCI. CCI has been used in many studies to predict and analyze the behavior of market agents and movement of prices including consumer expenditure behavior, the movement of asset pricing, stock market returns, and oil price [28], [30], [31], [32]. A study by [33] established the positive and significant long-run connection between CCI and economic growth/ development for the three main countries in Europe, which are France, Germany, and the UK. In the other study, [34] conducted an assessment on the relationship between consumer sentiment and market consumption expenditures

using the sample data of U.S. and the euro area. It is reported that when there are large feature changes in the household surveys, the explanatory power of market confidences in explaining consumption expenditures increases. The study also revealed a "confidence channel" of shock transmission between the U.S. and the Euro area. The U.S. market confidence indices are found to be predictive on the consumer confidences in Euro. Apart from this, the market confidence indices could be used to predict on investment decision as they contain the survey information on consumer and business sentiments. Forecasting of GDP fluctuations can be improved by including both CCI and BCI in the model [35]. By including both consumer and business sentiments in as regressors in forecasting the consumption expenditure, [36] claimed that the forecast accuracy could be increased by 4% to 13%.

A study by [37] found a significant covariance between stock market price and BCI in the U.S. stock market, based on 125 industrial stocks quarterly data from 1935 to 1953. On the other hand, [38] found that both consumer and business confidence indicators could explain about 7.42% of the variation of the U.S. stock market risk premium. In addition, the influence of consumer confidence is larger than that of the business confidence. Studies from other countries also reported a very similar result. For instance, [39] used the data of Vietnam reported a similar result with the study by [38] using the same method. Other than that, [40] studied the relationship between investor sentiment–and JSE performance. There is evidence to suggest that this relationship does exist and that investor sentiment is often used as one of the variables that assist predictors in preventing predicting errors [41]. In the other study conducted by [42] focused in U.S. and EU stock markets, there is a mixed results obtained. Their results revealed a negative influence of global market sentiment on the American stock market returns, while no relationship is found between the global sentiment and stork returns in the European market.

3 DATA

The main purpose of our study is to identify the main factors that may affect the performance of international stock returns. The stock return is constructed as the deviation of the natural log of a stock index at lagged one from its current period. The stock price index is proxy by the Morgan Stanley Capital International index (MSCI) of the U.S. which is collected from the Thomson Reuters Datastream. There are ten major sectors of MSCI as listed in Table 1.

Table 1: Description of data

Variable	Description/ measurement	Variable	Description/ measurement
LBCI	log of business confidence index	*LENERGY*	Log of MSCI – energy sector
LCCI	log of consumer confidence index	*LFIN*	Log of MSCI – financial
LCPI	log of consumer price index	*LHC*	Log of MSCI – health care
LOIL	log of Brent crude oil price	*LIND*	Log of MSCI – industrial
LPPI	log of producer price index	*LIT*	Log of MSCI – information technology
LCD	log of MSCI – consumer discretionary sector	*LRE*	Log of MSCI – real estate
LCS	log of MSCI – communication services	*LUTI*	Log of MSCI - utilities
LCSTAPLE	log of MSCI – consumer staples		

The explanatory factors, namely business confidence index (BCI) of the U.S., as well as consumer confidence index (CCI) of the U.S., consumer price index (CPI) of the U.S., global price of Brent Crude (oil price in U.S. dollars per barrel) and producer price index (PPI) of the U.S. The data of BCI and CCI are collected from the Organisation for Economic Co-operation and Development (OECD) database, while the others are retrieved from the FRED, or the Federal Reserve Bank of St. Louis. The data are presented in a monthly format, cover the period from January 1995 to December 2016, which total up to 264 observations. All data were transformed into a natural log form.

4 METHODOLOGY

The extended nonlinear autoregressive distributed lags (NARDL) model is adopted in modelling the asymmetric effects of consumer and business sentiments (CCI and BCI) on stock returns. The NARDL has the advantages of analyzing the asymmetrical effects (increases versus decreases) of an asymmetric variable which is obtained through data decomposition. While in the linear model, the estimates are based on the net effect of a variable which limits the information on the relationship studied. The nonlinear model is more applicable to the real economic situation as the relationship among economic variables may vary, triggering by economic structural changes and shocks.

The overall analysis comprises three main stages: Preliminary test, model estimation, and diagnostic checking. In the preliminary stage, unit-root tests are conducted in checking the stationarity property of each variable and to examine if the requirements of NARDL model are fulfilled. NARDL model requires all variables are integrated with order 0 and 1 (written as $I(0)$ and $I(1)$) but no variable is integrated with an order exceed 1. The null hypothesis is the series are not stationary. The rejection of the null hypothesis implies the series/ variable is stationary. The variables that are stationary at the level are $I(0)$ while those that become stationary after the first differenced are $I(1)$. Another related test is the bound test which is used to detect the presence of the long-run/ cointegrating relationship. This test was developed by [43] by referring the standard *F*- and *t*-statistics to the table of bound critical values in determining the significance of the joint lagged levels of the variables. The null hypothesis is there is no cointegration relationship. The test is significant/ rejected when the *F*-test statistic value exceeds the upper bound critical value while the non-significance or non-rejection is resulted when the *F*-statistic is lying below the lower bound. If the F-statistic lies between the two bounds, the result is inconclusive. When the result is inconclusive, the speed of adjustment (ϕ) in the NARDL model will be taken into consideration. For detail, please refer [43]. In the second stage, the estimation is performed using the NARDL model (which is explained in the following section) and in the third stage, the diagnostic tests (autocorrelation and heteroscedasticity tests) are performed to examine the residuals of estimates to ensure the results of estimates are reliable.

4.1 NARDL model

The ARDL model, as applied in [44], is a conventional cointegration approach. According to [45], this approach is preferable when variables involved are integrated of a different order and not more than order 1 i.e. $I(0)$ or $I(1)$, stable when there exists a long-run relationship in small size samples. The model takes the following representation:

$$y_t = \sum_{i=1}^{p} \lambda_i y_{t-i} + \sum_{i=0}^{q} \delta_i^* x_{t-i} + \varepsilon_t \quad (1)$$

where y_t denotes the endogenous variable while x_t is a $k\times1$ vector consists of exogenous variables; λ_i denotes the vector of scalars; δ_i^* is a $k\times1$ vectors consists of coefficients for exogenous variables; and ε_t denotes a disturbance which is normal distributed with zero mean and a finite variance; p and q each individually represents the respective optimal lag length for explanatory and dependent variables. This model can be specified in an error correction form (ECM) in the following way:

$$\Delta y_t = \phi y_{t-1} + \beta_i^{'} x_t + \sum_{i=1}^{p-1} \lambda_i^* \Delta y_{t-i} + \sum_{i=0}^{q-1} \delta_i^{*'} \Delta x_{t-i} + \varepsilon_t \tag{2}$$

with $\phi = -1\left(1 - \sum_{j=1}^{p} \lambda_j\right)$; $\lambda_i^* = \sum_{m=i+1}^{p} \lambda_m$ where $i = 1,2,...,...,p-1$ while $\beta_i = \sum_{i=0}^{q} \delta_i$, and $\delta_i^* = \sum_{m=i+1}^{q} \delta_m$, $i = 1,2,...,...,q-1$. This equation can be summarized as below after regrouping:

$$\Delta y_t = \phi\left(y_{t-1} - \theta_i^{'} x_t\right) + \sum_{i=1}^{p-1} \lambda_i \Delta y_{t-i} + \sum_{i=0}^{q-1} \delta_i^{*'} \Delta x_{t-i} + \varepsilon_t \tag{3}$$

where $\theta = -\left(\frac{\beta}{\phi}\right)$ is the parameter explains the long-run equilibrium relationship in the model. The parameters λ_i^* and $\delta_i^{*'}$ denote the short-run estimates for the lagged changes in the endogenous and exogenous variables respectively. On the other hand, ϕ denotes the error-correction term which measures the speed of endogenous variable in adjusting or converging to the long-run equilibrium. The convergence explains the reason why this parameter is in negative value.

The NARDL model is the nonlinear or asymmetric form of ARDL model which is advanced by [46]. It is developed from the conventional linear ARDL model by including the nonlinear asymmetric effect. Following the approach used in [47], the nonlinear asymmetric cointegration regression takes the following form:

$y_t = \beta^+ x_t^+ + \beta^- x_t^- + u_t$ and $x_t = x_0 + x_t^+ + x_t^-$

β^+ and β^- denote the asymmetric long-run estimates of the increases and decreases series (x_t^+ and x_t^-) respectively. The regressor x_t is decomposed to obtain x_t^+ and x_t^- following the following defined formulas. In other words, both both asymmetric series are obtained as the partial sum of positive/ increase and negative/ decrease changes respectively in x_t.

$$x_t^+ = \sum_{j=1}^{t} \Delta x_j^+ = \sum_{j=1}^{t} \max\left(\Delta x_j, 0\right)$$

$$x_t^- = \sum_{j=1}^{t} \Delta x_j^- = \sum_{j=1}^{t} \min\left(\Delta x_j, 0\right)$$

It can also be written in asymmetric ECM form as follow:

$$\Delta y_t = \phi\left(y_{t-1} - \theta_i^{'} x_t^{*} - \theta_i^{+'} - x_t^{+} - \theta_i^{-'} x_t^{-} \right) + \sum_{i=1}^{p-1} \lambda_i \Delta y_{t-i} + \sum_{i=0}^{q-1} \delta_i^{*'} \Delta x_{t-i}^{*} + \sum_{i=0}^{q-1} \delta_{1i}^{*'} \Delta x_{t-i}^{+} + \sum_{i=0}^{q-1} \delta_{2i}^{*'} \Delta x_{t-i}^{-} + \varepsilon_t \qquad (4)$$

with the short-run positive and negative estimates of $\delta_{1i}^{*'}$ and $\delta_{2i}^{*'}$ respectively and the long-run positive and negative estimates of $\theta_i^{+'}$ and $\theta_i^{-'}$ respectively and other parameters are as explained in equation (3). In this study, y_t is represented by the sectoral stock return of *MSCI* (the sectors that listed in Table 1). In particular, we seek to examine the asymmetric effect of *LCCI* and *LBCI* so that x_t^{+} and x_t^{-} (asymmetric series) are proxy by the increases and decreases series of *LCCI* and *LBCI* which are constructed based on the explanation mentioned above. Then, x_t^{*} are other control or explanatory variables (*LOIL, LCPI, LPPI*). In general, the estimation takes the following specifications:

Model I: *LBCI* is treated as the only asymmetric variable ($x_t^{+} = LBCI+$ and $x_t^{-} = LBCI-$)
Model II: *LCCI* is treated as the only asymmetric variable ($x_t^{+} = LCCI+$ and $x_t^{-} = LCCI-$)

5 RESULTS

In this study, the main focus is to detect the asymmetric effects of CCI and BCI on the returns of ten stock sectors as listed in Table 1.

Table 2: Bound test and speed of adjustment

Sector	Model-I	Model-II	Sector	Model-I	Model-II
F-statistic					
CD	2.5890++	2.8251++	HC	3.3380++	3.4479*
CS	1.5886	1.5693	IND	2.6153+	2.6038+
CSTAPLE	3.0343++	3.1713++	IT	2.3033+	2.1630+
ENERGY	2.6638+	2.6388+	RE	2.7189+	2.6477++
FIN	1.9841	1.9691	UTI	2.0010+	2.3432+
Speed of adj ϕ					
CD	-0.0546***	-0.0587***	HC	-0.0406**	-0.0354**
CSTAPLE	-0.0913***	-0.0961***	IND	-0.1221***	-0.1078***
ENERGY	-0.1148***	-0.1351***	RE	-0.0714***	-0.0721***
FIN	-0.0627***	-0.0559**	UTI	-0.1128***	-0.1161***

Note: *, ** and *** indicate that the result is significant at the level of 10%, 5% and 1% respectively
+, ++ and +++ denote the non-significance (inconclusive decision) at 10%, 5% and 1% respectively.

Prior to the estimation, the unit-root tests of Phillips-Perron (PP) and augmented Dicky-Fuller (ADF) were performed on all variables. The results showed that all variables are non-stationary at level form. However, all variables become stationary or integrated of order 1 or *I*(1) after the first differenced transformation. The results also found no variable integrated higher than order 1.

Therefore, it is eligible to apply the NARDL model. Next, the model specification on the optimum number of lags (*p, q*) in equation (4) is determined using the Akaike Info criterion (AIC) searching up to max of 10 lags for Model I (*LBCI* as an asymmetric variable) and Model II (*LCCI* as an asymmetric variable). The bound test is conducted to detect the presence of the long-run/ cointegrating relationship in the model. The results are as summarized in Table 2.

As observed, bound tests reported inconclusive decisions as the F-statistics are lying between the lower and upper bounds while two sectors (*CS* and *IT*) were found to have no long-run relationship Therefore, these two sectors will be excluded from the analysis (not eligible to apply the NARDL model) while the other eight sectors will further be examined with the speed of adjustment to judge if the cointegrating relationship exists. In all these eight sectors, a cointegrating relationship exists as the speed of adjustment parameters are in negative value and significant, implying there are convergences towards long-run equilibrium. Hence, the results of the NARDL models are valid. Next, we will discuss the results on these eight sectors by focusing on the impacts of *LBCI* and *LCCI*.

5.1 NARDL Estimation

Constraint by the page limit, we only reported the accumulated short-run estimates for the asymmetric variables of *LBCI* and *LCCI*. The accumulated short-run effects are obtained by summing up the significant coefficients of lagged terms (ignore the nonsignificant coefficients), see the results summarized in Table 3. The sign ***, ** and * denote the significance level at 1%, 5% and 10% respectively, this applies to the results of all tables.

Table 3: Short-run asymmetric estimates of *LBCI* and *LCCI*

Variable	Model-I	Model-II	Model-I	Model-II
	CD		CSTAPLE	
LBCI+	-0.3985*		-	
LBCI-	-		-0.3878**	
LCCI+		-		0.9346**
LCCI-		16.7395***		7.3332***
	ENERGY		FIN	
LBCI+	-12.4059**		0.0507***	
LBCI-	-		-11.7221**	
LCCI+		-		-
LCCI-		13.7880**		20.9627***
	HC		IND	
LBCI+	-0.6620*		-8.9617**	
LBCI-	-0.3313*		3.1694**	
LCCI+		0.7197*		-
LCCI-		8.9001***		18.5461***
	RE		UTI	
LBCI+	-6.8267***		-6.3150***	
LBCI-	14.7557**		-	
LCCI+		-		-
LCCI-		10.6934***		5.2313**

The results showed that the magnitude of increases and decreases effects in *LBCI* and *LCCI* are different, and vary across sectors. In general, *LBCI+* leads to lower stock returns while *LBCI-* leads to higher stock returns in the short-run. The possible reasons are when the business market has a positive expectation, there is a tendency to increase the production and investment which may involve the increment of cost in the short-run, hence returns drop temporarily. The same situation might explain the opposite condition. *LBCI+* has a relatively large impact in energy and industrial sectors while *LBCI-* has larger impacts in financial and real estate. On the other hand, *LCCI* has relatively large impacts on stock returns compared to *LBCI*. The decline in *LCCI* (*LCCI+*) has a large influence on stock returns compared with its increases. *LCCI-* leads to higher stock returns in many sectors, especially in the finance and industrial sectors. When there is a bad expectation in the future market, consumers tend to save money (less invest, less consume) and sell out their holding of portfolio and assets. All these may lead to lower production (lower demand) and lower investment. The increase in returns is temporary with the cut-off in the cost of production and transaction/ operations.

Table 4 reported the results of long-run estimates in NARDL models. It is found that both *LBCI* and *LCCI* have much larger and more significant impacts on stock returns in the long-run as compared to the short-run counterpart. Both factors could influence the behavior and decision of investors and the influences are much larger if compared to the macroeconomic factors (*LOIL, LPPI, LCPI*). The increases in oil price, consumer price, and producer price inflations (*LOIL*, *LCPI*, and *LPPI*) have some influences on the stock returns. However, the impacts are relatively small and vary across sectors.

Table 4: Long-run estimates

Variable	**Model-I**	**Model-II**	**Model-I**	**Model-II**
	CD		CSTAPLE	
LBCI	-	-5.3239	-	-3.8875**
LBCI+	0.6593	-	-3.0328**	-
LBCI-	-7.3819	-	-4.1925**	-
LCCI	11.1575*	-	8.7691***	-
LCCI+	-	16.0414**	-	9.7288***
LCCI-	-	3.5162	-	6.8848**
LCPI	-3.0489	-3.2038	0.6028	0.2665
LOIL	-0.2473	-0.1542	-0.3255**	-0.2836**
LPPI	1.2724	1.3238	2.2674***	2.1458***
C	-39.9996	36.3527	-48.8576***	11.4476
	ENERGY		FIN	
LBCI	-	-2.5782	-	-2.4518
LBCI+	-7.8396***	-	-2.5181	-
LBCI-	-1.7843	-	-3.1291	-
LCCI	13.3847***	-	13.7341**	-
LCCI+	-	4.0790	-	14.3899
LCCI-	-	18.2379***	-	7.3669
LCPI	3.5334**	5.6714***	0.9478	-0.7524
LOIL	0.2700*	0.1170	0.2438	0.3935
LPPI	1.3646	1.2998	-1.5892	-2.3751
C	-79.3450***	-13.9371	-56.1081	29.1485
	HC		IND	

LBCI	-	-10.8704*	-	-2.0392
LBCI+	-16.2904*	-	-3.6714	-
LBCI-	-8.1538*	-	0.2812	-
LCCI	12.9175**	-	15.0008***	-
LCCI+	-	20.3485*	-	-0.2725
LCCI-	-	7.7865	-	19.7262***
LCPI	-21.1958	-5.5164	-9.9456*	-12.9718**
LOIL	0.5040	-0.1942	0.2878	0.2655
LPPI	2.8378	3.5319	1.8366*	2.3742**
C	17.4924	61.0920	-33.0645	55.5746*
TREND	0.0434*	-	0.0209*	0.0345*
	RE		UTI	
LBCI	-	7.4991*	-	1.8197
LBCI+	4.0313	-	-2.9794	-
LBCI-	8.4001*	-	2.3894	-
LCCI	7.3037	-	13.3174***	-
LCCI+	-	12.5711*	-	3.1293
LCCI-	-	-7.4046	-	16.4570***
LCPI	-29.5855**	-6.9774*	2.7853**	4.5616***
LOIL	1.2681*	0.3409	-0.0433	-0.2601**
LPPI	0.1201	0.0496	1.5303*	1.9884***
C	89.5705	-1.9295	-76.0703***	-31.9076***
TREND	0.0541*	-	-	-

For instance, increases in *LPPI* and *LCPI* lead to increases in stock return in utilities. However, increases in *LCPI* cause a drop in stock returns in the real estate and industrial sectors. These three factors have no significant effect in the returns of consumer discretionary, financial, and health care sectors. The deviation of results might be explained by the sensitivity and the features of the related sectors. Financial and health care are service origins and their prices are less sensitive to production/ cost price changes which are driven by *LCPI*, *LPPI*, and *LOIL*. Although these three factors may have influences on the stock returns, their impacts are relatively small because they might not affect directly the behaviour and decision of individual investors. On the other hand, both *LBCI* and *LCCI* are more influential as both variables measure the sentimental and confidence towards the future economic condition based on their current financial situation. As observed, *LCCI* has large impacts compared to *LBCI* as consumers are the larger group in the market. In general, both increases and decreases in *LCCI* tend to lead to higher stock returns. However, results might be explained by the sensitivity of the sectors and how necessary the products to consumers. The very important/ necessity like energy, consumer staples, and health care, the returns will increase sharply when *LCCI* increases. The returns from these sectors also show increases but with a lower volume when *LCCI* declines. This is because when there is a bad expectation on the future market, the consumers may increase the storing of the necessary goods more for future usage, which leads to higher demand and production during. For higher *LCCI*, consumers have high confidence in the future market, so they may invest and spend more, which leads to even higher demand and production, hence returns increase under both scenarios. While industrial products tend to experience a decline in return with the decline in *LCCI* in the long-run.

The effect of *LBCI* only covers few sectors in the long-run. Both asymmetries in *LBCI* cause the drop in returns in the necessity goods sector like health care, energy, and consumer staples (essential

goods) as producers are sensitive to market demand and may adjust production accordingly. As essential goods are always growing in demand, the production might increase, prices might be controlled by the government for the public needs, so the returns might hardly increase in either scenario.

Finally, the results are tested for serial correlation and heteroscedasticity by applying the Breusch-Godfrey LM test and ARCH-LM tests. The results are as summarized in Table 5. In all cases, the results show the non-rejection of the null hypotheses (no serial correlation and homoscedasticity). Therefore, the results of NARDL are reliable and have no serial correlation and heteroscedasticity problems.

Table 5: Results of diagnostic tests

Sector	**LM test statistics**		**ARCH test statistics**	
	Model-I	**Model-II**	**Model-I**	**Model-II**
CD	2.8559*	2.3765*	2.5243*	2.0957*
CSTABPLE	0.2643	0.1800	0.3022	0.2624
ENERGY	1.2791	1.2127	2.3863*	2.8318
FIN	0.9341	2.2465	2.4450*	2.9220*
HC	0.5535	1.0610	2.3677*	2.1787*
IND	0.9686	1.4238	0.9160	0.4324
RE	0.5807	0.5829	0.1430	0.2122
UTI	0.1048	0.4241	2.0635	2.5808*

6 CONCLUSION

In this study, the main focus is to examine how consumer and business confidence might affect the stock returns of the main sectors in the international market. This study fills the gaps of previous literature by applying the NARDL model which enables the estimation of the asymmetric effect, in topping to the short-run versus long-run estimates of stock return determinants. Besides, the main focus is on market confidence which governs the behavior and expectation of the investors. Comparisons of results using disaggregated or sectoral data might provide extra information on the linkages of sectoral behavior with the market confidence/ sentiment in explaining the stock returns. Our results revealed that both consumer and business sentiments are crucial in determining the stock returns and their influences are asymmetric, significant, and dominant compared with other macroeconomic factors. However, results might vary across sectors with the larger influences from the consumer confidence factor. The results are consistent with previous findings that detected significant impacts of consumer and business sentiments on stock returns but using linear models, for instance [48]. The impacts are relatively much larger in the long-run compared to that in the short-run. Besides, the essential goods (energy, health care, and consumer staples) are more sensitive to both factors which are shown in higher returns in response to consumer confidence changes (increases and decreases) but resulted in lower returns impulsed by business confidence changes. The results imply that the market confidence and the behavior of investors are two main factors to be concerned in predicting the stock price movements.

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