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Rahman, Nadiah Abd and Masih, Mansur

INCEIF, Malaysia, Business School, Universiti Kuala Lumpur, Kuala Lumpur, Malaysia

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Does the islamic bank deposit have an effect on equity market ? Malaysian case

Nadiah Rahman[1] and Mansur Masih[2]

Abstract

The issue as to whether economic growth is largely influenced by the development of banking sector or by the financial markets still remains debatable. Both the financial institutions and financial market play a vital role in contributing to the development of the economy but, do they impact each other? This study attempts to answer one critical question: Does deposit on Islamic bank have an impact on the equity market in Malaysia? Although many literature exist on the linkages between the bank and the equity market, there is unavailability of literature relating to the impact of Islamic bank deposit on the investment in the stock market. Using standard time series techniques, it is found that the amount of total deposit in Islamic Bank would Granger-cause the Kuala Lumpur Composite Index. This shows that the deposit on Islamic Banking has influenced equity market in Malaysia. Thus, it is essential for coordination and cooperation among the regulatory bodies such as Bank Negara Malaysia, Bursa Malaysia and Securities Commission to strike a balance for both the capital market and the banking sector growth simultaneously to achieve the best outcome.

Keywords : Islamic bank deposit, equity market, VECM, VDC, Malaysia

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[1] INCEIF, Lorong Universiti A, 59100 Kuala Lumpur, Malaysia.

2 **Corresponding author**, Senior Professor, UniKL Business School, 50300, Kuala Lumpur, Malaysia.

Email: mansurmasih@unikl.edu.my

1.0 INTRODUCTION

1.1 THE THEORETICAL CONTROVERSY

A theory of classical economist suggests a notion that deposit in banking can be associated to saving behaviour of depositors, which is influenced by the rate of return on deposit i.e. deposit rate. As deposit rate is commonly reflecting the interest rate, theory posits that higher interest rate would encourage more savings since the return on deposit is higher. On the contrary, high interest rate would also mean higher cost of borrowing and higher cost of spending. Thus, bank's lending is expected to slow down in a high interest rate environment and vice versa.

Consequentially on the investment side, high interest rate would make equity investment less interesting since investor now has an option to reduce their risk intake by opting out from equity investment and send their money to a safer deposit instrument while still able to gain a relatively high return. Of course, the behaviours of depositors and investors depend on many factors such as their risk tolerance, the current economic condition, and investment horizon. Hence, it would be the interest of the authors to find the relation between deposit in the banking system, as opposed to investment in the equity market.

1.2 THE EMPIRICAL CONTROVERSY

To the author's best knowledge, there are not many researches that have empirically proven that deposits would have a Granger-causality towards the equity market. One of the closest one would be the journal by Odhiambo (2010) where he used the newly introduced ARDL-Bounds testing approach as proposed by Pesaran et al. (2001) to examine the linkage between banks and stock market development in South Africa. It was proven empirically that there is a significant positive relationship between banks and stock markets in South Africa, irrespective whether the model is estimated in the short run or in the long run. Odhiambo also suggested that in the short run, the stock market development in South Africa is positively determined by the level of savings, but is negatively affected by the rate of inflation and the lagged values of the stock market developments. Whereas the stock market in the long run is positively determined by real income

and the inflation rate. As Islamic bank grows in South Africa, the literature could then be extended to see the impact Islamic deposit would have on its equity market.

Most other literatures revolved around the discussion on how the banks (in general) and stock markets would impact the growth of the economy. Some authors, like Levine and Zervos (1998) and Beck and Levine (2004), have empirically proven that both banks and stock markets have positively influenced economic growth. While other authors debate which of the two markets would provide better boost to the economy. Literatures by Demirguc-Kunt and Levine (1999) and Yartey (2008) suggested that countries at the early stage of development tend to have larger bank-based economy, whereas more developed countries would rely more on the market-based economy (equity market, etc.). A more detailed Literature Review will be explained in Section 2.

1.3 THE RESEARCH QUESTION AND GAPS TO BE ADDRESSED

This study has one main research question, which is to prove theoretically and empirically on the following question: Does deposit on Islamic Bank has an impact on the equity market in Malaysia?

Although there are many literatures illustrating the linkages between the bank and the equity market, there is a clear gap that needs to be addressed on the unavailability of literatures connecting the deposit on bank and the investment on the stock market, as mentioned earlier. As Islamic bank is a relatively new industry and new data can now be collected, author would like to see the impact an Islamic deposit would have on the equity market, and in turn, towards the growth of economy. Being one of the pioneer and established Islamic Finance industry, author believes studying the sample of Malaysia is practical and a novel one.

It is also worth noting that an investor can freely change its investment on equity to become a saving in deposit or vice versa for depositor. Hence, since author is interested to study the behavioural finance perspective of an investor / depositor, author may want to make a humble attempt to empirically test the causal relationship linking deposit on Islamic banking and the stock market in Malaysia.

1.4 SUMMARY OF THE FINDINGS

Based on our empirical study, it was found that the amount of Total Deposit (TD) in Islamic Bank would Granger-cause the Kuala Lumpur Composite Index (KLCI). In short, the deposit on Islamic Banking would have a significant and inverse relationship with equity market in Malaysia since TD is the most exogenous variable while KLCI is the most endogenous variable as per VDC test.

While KLCI is supervised by Securities Commission of Malaysia (SC) and Bursa Malaysia (Bursa), all the other leaders variable such as TD, CPI, and BLR, are variables controllable by the Central Bank of Malaysia, BNM. Hence, cross-organisation coordination and cooperation is crucial in ensuring Malaysia's economy could grow in a stable manner, where both the capital market and the banking sector is desired to grow hand-in hand, to achieve the best financial outcome. As such, perhaps it is ultimately the role of Ministry of Finance (MoF) which has oversight over these financial organisations to ensure that unintended consequence of mishaps in policy-making could be avoided.

1.5 STRUCTURE OF THE PAPER

The rest of this paper is organized as follows. Section 1 starts with the introduction part, where several points have been highlighted such as the issues motivating this study, objectives of the study, and the theory underpinning the discussion. Section 2 reviews the empirical literature to find the relationship between deposit in Islamic bank and stock market. Data sources and the methodology applied in this study are documented in Section 3. Section 4 presents the results and the interpretations of the empirical work using the 8-step time-series approach. Section 5 concludes the study while Section 6 explains the limitations of the study followed by the potential research area going forward. Bibliographies are listed down in Section 7, while Section 8 exhibits the appendices.

2.0 LITERATURE REVIEW

Due to the inadequate time allocated to conduct the analysis and find relevant literatures on this topic, only a limited amount of literature reviews could be performed. To the author's best knowledge, there are not many researches on finding the empirical Granger causality between deposits on Islamic bank towards the equity market, especially on the case of Malaysia's stock market. Hence this is the gap that the author would like to address.

Classical economist notions that deposit in banking can be related to saving behaviour, which is a function of deposit rate. As deposit rate is commonly reflected by the interest rate, the theory posits that the higher the interest rate is, the more money will be saved since return is higher. On the contrary, the cost of borrowing and cost of spending tends to be higher and thus, bank's lending will slow down. Whereas on the investment side, high interest rate would make equity investment less interesting since investor can deposit their money at a safer deposit instrument while still able to gain relatively high return.

One of the closest literature connecting bank's deposit and equity market is the journal by Odhiambo (2010) where he used the newly introduced ARDL-Bounds testing approach as proposed by Pesaran et al. (2001) to examine the linkage between banks and stock market development in South Africa. It was proven empirically that there is a significant positive relationship between banks and stock markets in South Africa, irrespective whether the model is estimated in the short run or in the long run. Odhiambo also suggested that in the short run, the stock market development in South Africa is positively determined by the level of savings, but is negatively affected by the rate of inflation and the lagged values of the stock market developments. Whereas the stock market in the long run is positively determined by real income and the inflation rate. As Islamic bank grows in South Africa, the literature could then be extended to see the impact Islamic deposit would have on its equity / futures market.

Similarly, Uddin and Alam (2009) have found that interest rate has significant negative relationship with share price in all of his 15 samples of developing and developed countries. Additionally, for six countries it was found that changes of interest rate has significant negative

relationship with changes of share price. So, if the interest rate could be controlled for these countries, it will be the great benefit of these countries' stock exchange through demand pull way of more investors in share market, and supply push way of more extensional investment of companies. However, the gap of this literature and the author's intention is Uddin and Alam did not tie back the interest rate to the deposit rate and / or amount of total deposit.

Compared to the scarcity of literatures portraying Bank's deposit causality towards stock market, author has noted there are abundances of discussions on how the banks and stock markets impact the growth of the economy. Levine and Zervos (1998) have empirically shown in their paper that increasing liquidity in the stock market liquidity and development of banking system both positively predict growth, capital accumulation, and productivity improvements, even after controlling for economic and political factors. These results are consistent with the views that financial markets provide important services for growth, and that stock markets provide different services from banks.

Similarly, Beck and Levine (2004), in their paper, used a panel data set for the period of 1976 – 1998 and applying recent generalized-method-of moments techniques developed for dynamic panels, to investigate the impact of stock markets and banks on economic growth. They also found that stock markets and banks positively influence economic growth and these findings are not due to potential biases induced by simultaneity, omitted variables or unobserved country-specific effects.

There are also debates centring on the complementarity versus the substitutability between the two financial systems – bank-based economy or market-based economy. Since both banks and stock markets intermediate savings towards investment, some authors view them as either substitutes or as complements, as mentioned by Naceur et al. (2007) in the case of Middle East and North Africa (MENA), rather than competitive systems (Ndikumane, 2005). In other words, what is important is not whether a financial system is bank-based or stock market-based, but rather how well-developed and efficient the financial systems are. Demirguc-Kunt and Levine (1998) too supported this argument by stating that banks, stock markets and other financial intermediaries all grow and become more active and efficient as countries become richer.

Some researchers have extended their studies to show that the role of the stock market in economic growth is dependent on a country's development stage. In the early stages of development or in a boom, banks play a predominant role in stimulating economic growth. However, as a country reaches higher levels of income, stock markets tend to play an increasing role (Demirguc-Kunt and Levine, 1999). This means that more-developed countries are expected to have relatively larger and more liquid stock markets, while less-developed countries are expected to be largely bank-based. Yartey (2008) also posited the same as the author claims that at the early stages of a country's development, banking sector development serves as a complement to the stock market development in financing investment. However, as the two systems develop, they begin to compete with each other as vehicles for financing investment (although Yartey did not mention which system would outweigh the other in terms of its importance towards economic growth).

In examining the macroeconomic determinants of stock market development, Garcia and Liu (1999) linked financial intermediary development to have a positive impact on stock market development in a sample of Latin America (LATAM) and Asian countries. Whereas the empirical work done by Demirguc-Kunt and Levine (1996) also shows that the degree of stock market development is positively related to that of bank development. Contrary to the studies above, Garcia (1986) argued that central banks, depending on its macroeconomic policies, may create a negative correlation between bank growth and stock market development.

Although there are many literatures illustrating the linkages between the bank and the equity market, the hole to be filled up is the unavailability of literatures connecting the deposit of the bank and the investment on the stock market, as mentioned earlier. It is worth noting that an investor / depositor can freely change its investment on equity to become a saving in deposit or vice versa. Hence, since author is interested to study the behavioural finance perspective of an investor / depositor, author may want to make a humble attempt to empirically test the causal relationship linking deposit on Islamic banking and the stock market in Malaysia.

3.0 DATA AND METHODOLOGY

This study uses monthly statistical bulletin of Bank Negara Malaysia (BNM), spanning over fourteen years starting from January 2001. Based on the literature discussed above, the variables selected for this study are Total Islamic Banks' Deposit (TD), Kuala Lumpur Composite Index (KLCI), Islamic Savings Profit Rate (IS), Base Lending Rate (BLR), Consumer Price Index (CPI) and Money Supply (M3).

Since the variables mentioned above are in the form of I(1), time series technique is used in this study. The author tries to find out whether deposit on Islamic bank moves together with the stock market in Malaysia through the Engle-Granger (EG) and Johansen-Juselius (JJ) cointegration tests after examining the unit root tests and lag order of Vector Auto Regression (VAR). The cointegrating estimated vectors will then be subjected to Exact- and Over-identification restrictions based on prior information of the economy. The test of the Vector Error Correction Model (VECM) will then indicate the causal relationship between the Islamic bank's deposit and stock market. Moreover, the Variance Decomposition (VDC) would determine the relative exogeneity and endogeneity of each variable. Next, the Impulse Response Function (IRF) will then map out the dynamic response path of a variable to a one period Standard Deviation (SD) shock to another variable. Finally the Persistence Profile (PP) step would estimate the speed of which the stock market gets back to equilibrium when there is a system-wide shock.

Time series is superior compared to traditional regression technique due to some reasons. First, the data decide which variable should be dependent and independent, while in regression, researcher predetermined the variables beforehand. Second, most of finance and economics variables are non-stationary in their level form. The non-stationarity of variables will result in conventional statistical test such as R^2 and t-statistic invalid because the variances are changing and the estimated relationship is 'spurious'. However, if the variables are non-stationary and not cointegrated, conclusion on differenced form of variables' is only valid for short run instead of long run. Lastly, the regression makes assumption about the long run theoretical relationship among the variables, whereas the time series test the Granger-causality between the variables.

4.0 RESULTS AND INTERPRETATION

Under this section of this paper, the 8-step of the time series techniques will be carried out and the empirical results obtained will be explained in further detail.

4.1 UNIT ROOT TESTS

For the unit root tests, three types of tests will be carried out which are the Augmented Dickey Fuller (ADF), the Phillips Perron (PP) and Kwiatkowski-Phillips Schmidt-Shin (KPSS) tests as described below.

4.1.1 AUGMENTED DICKEY FULLER (ADF) TEST

The empirical testing is started with ADF test to determine the stationarity of the variables in order to avoid spurious regression (Karim and Karim, 2008). All the variables should be in their level form or their natural logarithm form when carrying out the ADF test. After the ADF test is carried out in their level form, results reveal that all the variables used in the study contain a unit root which implies that the null hypothesis of the presence of a unit root at the level form cannot be rejected since the test statistic is lesser than the 95% critical value. Since all variables are found to be non-stationary at level form, these variables are then transformed into their first differenced form. The results of the ADF test shows that all variables became stationary after first differencing since they are able to reject the null hypothesis of non-stationarity when the test statistics of the differenced variables are more than the 95% critical value. Table 1 below summarizes the results.

Augmented Dickey-Fuller						
Variable	**ADF**		**Value**	**t-stat**	**C.V**	**Result**
Level Form of Variables						
LKLCI	ADF(1)	SBC	283.5854	-2.7764	-3.4374	Non-Stationary
LCPI	ADF(1)	SBC	669.0027	-3.3055	-3.4374	Non-Stationary

LBLR	ADF(2)	SBC	466.1933	-2.7743	-3.4105	Non-Stationary
LIS	ADF(1)	SBC	190.9361	-2.9047	-3.4374	Non-Stationary
LM3	ADF(1)	SBC	544.8462	-2.6357	-3.4374	Non-Stationary
LTD	ADF(1)	SBC	374.5069	-1.4643	-3.4374	Non-Stationary
First Difference Form of Variables						
DKLCI	ADF(1)	AIC	287.4582	-8.1981	-2.9090	Stationary
DCPI	ADF(4)	AIC	667.7856	-6.6782	-2.9139	Stationary
DBLR	ADF(1)	AIC	468.2517	-6.0465	-2.8356	Stationary
DIS	ADF(1)	AIC	195.1449	-13.1119	-2.8356	Stationary
DM3	ADF(1)	AIC	545.0104	-7.9441	-2.8356	Stationary
DTD	ADF(1)	AIC	378.6663	-8.1142	-2.8356	Stationary

Table 1: ADF Test

By relying primarily on AIC and SBC criteria, the conclusion that can be made from the results above is that all variables that are used in this analysis are I(1) and therefore, we can proceed with testing for cointegration. We have selected ADF regression order based on the highest computed value for AIC and SBC when determining which test statistic to compare with 95% critical value for ADF test statistics. In this study, SBC is chosen for variables in level form, while AIC is used for variables in difference form. Taking different orders of AIC and SBC is not an issue as in all cases, the implications are consistent.

4.1.2 PHILLIPS PERRON (PP) TEST

Alternative to ADF test, PP test was used as non-parametric model to control for serial correlation. PP test ensures the higher order serial correlations in the ADF equation were handled properly (Valadkhani and Chancharat 2007). The null hypothesis for the PP test is that the variable is non-stationarity. Table 2 below shows the results of the PP test

Phillips-Perron			
Variable	**t-stat**	**C.V**	**Result**
Level Form of Variables			
LKLCI	-2.5729	-3.4980	Non-Stationary
LCPI	-2.4232	-3.4980	Non-Stationary
LBLR	-2.2066	-3.4980	Non-Stationary
LIS	-6.1776	-3.498	Stationary
LM3	-3.6865	-3.4980	Stationary
First Difference Form of Variables			
DKLCI	-10.7999	-2.9101	Stationary
DCPI	-8.5252	-2.9101	Stationary
DBLR	-9.9837	-2.9101	Stationary
DIS	-34.5645	-3.5429	Stationary
DM3	-11.5573	-2.9101	Stationary
DTD	-12.4730	-2.9101	Stationary

Table 2: PP test

4.1.3 KWIATKOWSKI-PHILLIPS SCHMIDT-SHIN (KPSS) TEST

KPSS has been developed to complement unit root tests as the last have low power with respect to near unit root and long run trend processes. The null hypothesis for the PP test is that the variable is stationary. Table 3 below shows the results of the KPSS test.

KPSS Stationarity			
Variable	**t-stat**	**C.V**	**Result**
Level Form of Variables			
LKLCI	0.06512	0.13668	Stationary
LCPI	0.84830	0.13668	Non-Stationary
LBLR	0.68592	0.13668	Non-Stationary
LIS	0.17262	0.13668	Non-Stationary

LM3	0.83825	0.13668	Non-Stationary
LTD	0.09559	0.13668	Stationary
First Difference Form of Variables			
DKLCI	0.086252	0.39145	Stationary
DCPI	0.15939	0.39145	Stationary
DBLR	0.13022	0.39145	Stationary
DIS	0.22185	0.39145	Stationary
DM3	0.15147	0.39145	Stationary
DTD	0.1009	0.39145	Stationary

Table 3: KPSS test

Since PP test and KPSS test have found that there is a combination of stationary and non-stationary in level form of variables, we have selected the results from ADF test to proceed to the next level as all three tests are equally reliable.

4.2 DETERMINATION OF THE ORDER OF LAGS OF THE VECTOR AUTO REGRESSION (VAR)

The next step is to determine the lag order of VAR which is the number of lags that needs to be used in this study. The VAR computation is identified based on adjusted LR test more than 5% and highest AIC and SBC. Table 4 below shows the highest selected AIC and SBC. AIC gives higher order of 2 than SBC for 0.

Order	AIC	SBC	Adjusted LR (p-value)	C.V
2	2555.3	-	[0.029]	1%
0	-	2.513.3	[0.000]	1%

Table 4: Order of VAR

Additionally, problem of serial correlation for each variable is checked and the results are shown in the table 5 below. According to the table below, serial correlation exists. Therefore if we adopted a lower order of lags, the effects of serial correlations may be reduced. On the other hand,

if a higher order of lag is taken, it leads to the disadvantage of risking over-parameterisation. Since we have a relatively long time series (168 observations), the risk of over-parameterisation is not material. Taking into consideration about the trade-off between lower and higher orders, the higher VAR order of 2 is chosen for the purpose of this study

Variable	Chi-Square (p-value)	Implication (at 10%)
DKLCI	0.018	There is serial correlation
DCPI	0.068	There is no serial correlation
DBLR	0.015	There is serial correlation
DIS	0.721	There is no serial correlation
DM3	0.004	There is serial correlation
DTD	0.008	There is serial correlation

Table 5: Tests for serial correlation of the variables

4.3 COINTEGRATION TESTS

After establishing that all the variables are I(1) and determining that the optimal order of VAR is 2, we proceed to test for cointegration. The test of cointegration is to ensure that the variables are moving together in one or two directions. If they are cointegrated, it is said that they are theoretically related. There are two type of tests for cointegration namely EG test and JJ test.

4.3.1 ENGLE GRANGER (EG) TEST

EG test uses the residual based approach where it can only determine whether there is cointegration or not. As for the EG test, many various linear equations were constructed but unfortunately only one equation resulted in cointegration by referring to the Table 6 below. See

Equation	t-stat	C.V	Result
LKLCI INPT LCPI LBLR LM3 LTD LIS	-4.9004	-4.8109	Cointegration
LCPI INPT LKLCI LBLR LM3 LTD LIS	-3.8490	-4.8109	No cointegration
LBLR INPT LCPI LKLCI LM3 LTD LIS	-3.7490	-4.8109	No cointegration

LM3 INPT LCPI LBLR LKLCI LTD LIS	-3.6226	-4.8109	No cointegration
LTD INPT LCPI LBLR LM3 LKLCI LIS	-2.2461	-4.8109	No cointegration
LIS INPT LCPI LBLR LM3 LTD LKLCI	-3.5557	-4.8109	No cointegration

Table 6: Engle Granger Test

An evidence of cointegration implies that the relationship among stock market with the deposit in Islamic bank is not spurious; meaning that there is a theoretical relationship among the variables and that they are equilibrium in the long run. It implies that each variable contains information for the prediction of other variables (Meera et. al 2009).

4.3.2 JOHANSEN-JUSELIUS (JJ) TEST

The other alternative of testing cointegration is JJ method which uses maximum likelihood where it can identify how many cointegration exist. It was found that Trace statistic indicates that there is two cointegrating vector while the Maximal Eigen value shows one cointegrating vectors.

Null, Ho	**Alternative, Ha**	**Statistic**	**95% CV**	**90% CV**	**Result**
Maximal Eigenvalue Statistics					
r = 0	r = 1	65.1956	43.6100	40.7600	1 cointegration
r ≤ 1	r = 2	32.0426	37.8600	35.0400	
Trace Statistics					
r = 0	r ≥ 1	150.2647	115.8500	110.6000	2 cointegration
r ≤ 1	r ≥ 2	85.0692	87.1700	82.8800	
r ≤ 2	r ≥ 3	53.0265	63.0000	59.1600	

Table 7: Johansen Test

The null hypothesis for Maximal Eigenvalue is r=0, where the statistic is higher for both 95% and 90% critical value, causing us failing to reject the null of no-cointegration. Otherwise, for Trace statistics, the statistic is higher than the 90% critical value when r ≤ 1, enabling the null of one cointegration to be rejected which resulted in 2 cointegration. From the results obtained, it can be seen that the number of cointegration for Maximum Eigenvalue is conflicting with the Trace statistic. However, the cointegration found in the EG test tied back to the result in JJ test. This

indicates that there is a theoretical relationship among all the variables and they move together in the long-term. This notion is supported by Odhiambo (2010) in his attempt to examine the linkage between banks and stock market development in South Africa. In the context of long-run relationship, it was proven empirically that there is a significant positive relationship between banks and stock markets in South Africa.

In order to make the coefficients of the cointegrating vector consistent with the theoretical information, we applied the LRSM procedure which is the next step after this (Masih and Algahtani 2008).

4.4 LONG RUN STRUCTURAL MODELLING

The LRSM tests the long-run coefficients of the variables, to see whether it ties back to the theoretically expected values. It also tests whether the variables are significant or not by employing both exact-identifying and over-identifying restrictions based on theories and prior information of economies (Masih et. al 2010)

Variable	**Panel A** A1=1	**Panel B** A1=1; A5=0
LKLCI	1.0000 (*NONE*)	1.0000 (*NONE*)
LCPI	10.1549* (1.5410)	10.0804* (1.5115)
LBLR	-1.1054* (0.2454)	-1.0889* (0.2374)
LIS	0.4072* (0.1402)	0.3962* (0.1343)
LM3	0.2443 (0.7060)	0.0000 (*NONE*)
LTD	-0.5421* (0.1379)	-0.5214* (0.1215)

Trend	0.0326 (0.0106)	0.0159 (0.0024)
Chi-Square	NONE	0.12368 [.725]

Table 8: Long Run Structural Modelling

Note 1: The output above shows the maximum likelihood estimates subject to exact-identifying (Panel A) and over-identifying (Panel B) restrictions. The Panel A estimates show that all variables are significant except LM3. The over-identifying restrictions on LM3 in Panel B results in all variables are significant. The restriction is correct because the Chi-Square p-value is more than 5%.

*Note 2: * indicates significance at 5% level.*

Variable	Coefficient	Standard Error	t-ratio	Implication
LKLCI	-	-	-	-
LCPI	10.1549	1.5541	6.5343	Variable is significant
LBLR	-1.1054	0.2454	-4.5045	Variable is significant
LIS	0.4072	0.1402	2.9042	Variable is significant
LM3	0.2443	0.7060	0.3460	Variable is insignificant
LTD	-0.5421	0.1379	-3.9311	Variable is significant

Table 9: Significance of variable at exact identification (Panel A)

Since the cointegrating relationship is one, we imposed an exact identifying restriction of one towards the coefficient of KLCI (A1=1) since it is our interested variable. By exactly identifying the coefficient of KLCI, we initially obtained results shown under Panel A in the Table 9 above (See Appendix G) and it turns out that LM3 are statistically insignificant by observing their t-ratios that are lower than 2. So we carry out over identification tests for LM3 where we made it equal to zero and the results are shown in Panel B in the Table 10 below. It was found that LM3 is significant after over identification since p-value of the chi square for this is lower than 5%. This indicates that the null hypothesis which states that each variable is equal to zero is not able to be rejected at 95% confidence level.

Variable	Coefficient	Standard Error	t-ratio	Implication
LKLCI	-	-	-	-
LCPI	10.0804	1.5116	6.6687	Variable is significant
LBLR	-1.0889	0.2374	-4.5868	Variable is significant
LIS	0.3962	0.1343	2.9498	Variable is significant
LM3	-	-	-	-
LTD	-0.5214	0.1216	-4.2892	Variable is significant

Table 10: Significance of variables after over-identification of LM3 (Panel B)

From the above analysis, we arrive at the following cointegrating equation (numbers in parentheses are Standard Errors).

$$\mathbf{KLCI + 10.155\ CPI - 1.1054\ BLR + 0.407\ IS + 1.8446\ M3 - 0.5421\ TD \longrightarrow I(0)}$$
$$\mathbf{(1.541)\quad (0.2442)\quad (0.1402)\quad (0.7060)\quad (0.1379)}$$

It is crucial to note that TD is found to be negatively significant i.e. Islamic Bank's deposit has an inverse relationship with the equity market, represented by KLCI.

4.5 VECTOR ERROR CORRECTION MODEL

The previous step managed to show us that these variables are cointegrated to a significant degree, but it does not indicate the causality between the variables. Constructing the VECM would enable us to identify the leaders and followers of the variables' relationship. The leader is the exogenous variable and is also known as independent variable. The exogenous have strong influence towards endogenous variable (i.e. the follower / lagging / dependent variable), yet the endogenous variable have little to no influence to the exogenous variable. The VECM is able to differentiate between short run and long run causality. It uses Granger causality to examine whether the past changes in one variable contribute to the current changes in another variable (Gupta n.d.). Additionally, the coefficient of the Error Correction Term (ECT) tells us how long it will take for the disequilibrium in the dependent variable to get corrected to equilibrium.

From Table 12 below, we found that there are three exogenous variables which are KLCI, CPI and BLR and three endogenous variables which are IS, M3 and TD. The null hypothesis is the variable is endogenous. Since the p-value is below 5% significance level, KLCI, CPI and BLR are endogenous. On the other hand, IS, M3 and TD are exogenous since their p-value are above 5% significance level. This tends to indicate that KLCI, CPI and BLR respond to IS, M3 and TD given that the ECT in KLCI, CPI and BLR are significant. This implies that the deviation of the exogenous variables IS, M3 and TD have a significant feedback effect on the KLCI, CPI and BLR that bear the burden of adjusting themselves in the short run to bring about the long-term equilibrium. These indicate that exogenous variables would transmit the effects of the shock to other endogenous variables when they experience shocks from the market (Masih et. al 2010). The diagnostics of all equations of the VECM tends to show positive results except for normality, as shown in Table 11 below. Therefore, we must keep in mind that the equations of the VECM are experiencing problems of non-normality which may affect the reliability of the results obtained under the VECM technique. This aspect would be used later for comparison, if the results between the VECM and the VDC are to be conflicting with each other

Variable	dLKLCI	dLCPI	dLBLR	dLIS	dLM3	dLTD
dLKLCI	0.1651*	0.0087	0.0031	-0.2356	0.0374*	-0.0426
	(0.0721)	(0.0071)	(0.0249)	(0.1317)	(0.0154)	(0.0438)
dLCPI	1.8587*	0.3945*	0.0873	4.3616*	0.0855	-0.3625
	(0.8032)	(0.0071)	(0.2773)	(1.4669)	(0.1716)	(0.4876)
dLBLR	0.0940	0.3992*	0.2289*	-0.6044	-0.0257	0.0231
	(0.2231)	(0.0220)	(0.0770)	(0.4074)	(0.0477)	(0.1354)
dLIS	0.0892*	-1.9179*	0.0088	-0.4753*	0.0046	0.0054
	(0.0384)	(0.0038)	(0.0133)	(0.0702)	(0.0082)	(0.0233)
dLM3	0.1128	0.0393	-0.1048	0.6978	0.0164	-0.0280
	(0.3702)	(0.3647)	(0.1278)	(0.6762)	(0.0791)	(0.2248)
dLTD	0.0456	-0.0049	0.0358	-0.1260	0.0767*	0.0486
	(0.1372)	(0.0135)	(0.0474)	(0.2506)	(0.0293)	(0.0833)
ecm1(-1)	-0.2182*	-0.0071*	0.0255*	-0.0264	-0.006	0.01159
	(0.0351)	(0.0035)	(0.0121)	(0.0641)	(0.0075)	(0.0213)

Chi-Square SC(1)	17.8775 [.119]	13.7937 [.314]	9.5851 [.652]	19.9688 [.068]	26.4818 [.009]	19.0558 [.087]
Chi-Square FF(1)	1.9826 [.159]	4.2045 [.040]	11.6015 [.001]	36.1315 [.000]	0.05990 [.807]	0.13389 [.714]
Chi-Square N(2)	5.7915 [.055]	16236 [.000]	956.1058 [.000]	5688.9 [.000]	12.7725 [.002]	981.495 [.000]
Chi-Square Het(1)	1.1609 [.281]	1.1716 [.279]	10.2274 [.001]	15.8863 [.000]	2.2563 [.133]	1.4325 [.231]

Table 11: Vector Error Correction Model

Note 1*: The diagnostics are chi-squared statistics for serial correlation (SC), functional form (FF), normality (N) and Heteroskedasticity (Het) and indicate that the equations suffer from the problem of non-normality.*

Note 2*: Standard Errors are given in parenthesis. *Indicates significance at 5% level.*

ecm1(-1)	Coefficient	Standard Error	t-ratio [prob]	Result
LKLCI	-0.21821	0.35090	-6.2185[.000]	Endogenous
LCPI	-0.0071	0.0035	-2.0443[.043]	Endogenous
LBLR	0.0255	0.1212	2.1061[.037]	Endogenous
LIS	-0.0264	0.0641	-0.41123[.681]	Exogenous
LM3	-0.0060	0.0075	-0.80218[.424]	Exogenous
LTD	0.0116	0.0213	0.54408[.587]	Exogenous

Table 12: Exogeneity and Endogeneity of Variables

Besides determining the absolute exogeneity and endogeneity of variables, the VECM technique is able to tell how long does it take for the variable to go back to long term equilibrium if the variable experiences a shock (Masih 2013). In the case of KLCI, the coefficient is 0.2182 which implies that when a shock is applied to KLCI, it would take an average of about 5 weeks (1/0.2182) to get back into equilibrium with the other variables.

4.6 VARIANCE DECOMPOSITION ANALYSIS

Although the VECM tends to indicate the exogeneity and endogeneity of the variable, it cannot tell which variable is the strongest leader and which variable is the weakest follower. The VDC technique will determine the relative exogeneity or endogeneity of the variables by recognizing the proportion of the variance explained by its own past. The most exogenous variable is the variable that is explained mostly by its own shocks (and not others). The VDC technique is further broken down into the orthogonalized and generalized type.

HORIZON		LKLCI	LCPI	LBLR	LIS	LM3	LTD	RANK
LKLCI	12	47%	46%	1%	3%	0%	3%	6
LCPI	12	7%	87%	4%	2%	0%	0%	2
LBLR	12	5%	15%	78%	1%	0%	0%	5
LIS	12	4%	6%	10%	79%	1%	0%	4
LM3	12	3%	2%	0%	1%	88%	5%	1
LTD	12	8%	1%	2%	1%	6%	83%	3
LKLCI	24	40%	53%	0%	3%	0%	3%	6
LCPI	24	8%	85%	5%	2%	0%	1%	2
LBLR	24	5%	17%	77%	1%	0%	0%	5
LIS	24	4%	7%	11%	78%	1%	0%	4
LM3	24	3%	3%	0%	1%	88%	6%	1
LTD	24	8%	1%	2%	1%	6%	83%	3
LKLCI	36	38%	55%	0%	3%	0%	3%	6
LCPI	36	8%	84%	5%	2%	0%	1%	2
LBLR	36	5%	17%	76%	1%	0%	0%	5
LIS	36	4%	7%	11%	77%	1%	0%	4
LM3	36	3%	3%	0%	1%	87%	6%	1
LTD	36	8%	1%	2%	1%	6%	83%	3

Table 13: Orthogonalized Variance Decomposition

***Note**: The output of the Orthogonalized VDC indicates that M3 is the most exogenous variable for all horizons since it has the highest ranking of 1.*

Table 13 above shows the results obtained from the Orthogonalized VDC for 3 time horizons (12, 24 and 36 weeks). The rows show the percentage of the variance of forecast error of each variable into proportions attributed to shocks from other variables, coming from the columns, including its own. While the columns are read as the percentage in which that variable contributes to other variables in explaining the observed changes. From the table above, the ranking remain constant for all the three horizons.

However, the result obtained conflicting with the previous VECM analysis, since previously TD was found to be the most exogenous variable, but here in VDC, M3 is the most exogenous. The shortcomings of Orthogonalized VDC are it is not unique and it depends on the particular ordering of the variables in the VAR. The first variable in the order would report the highest percentage and would likely be the most exogenous variable – which in this case is the M3 variable. Another weakness of the Orthogonalized VDC is that it assumes all other variables are "switched off" when one particular variable is shocked.

Due to such weaknesses of the Orthogonalised VDC, the Generalized VDC is relied upon since it is indifferent to the ordering of the variables and when a particular variable is shocked, the other variables in the system are not assumed to be switched off (Masih 2013). However, the numbers in generalized VDC do not add up to 1.0 (100%). Thus, for a given variable, at the specified horizon, we totalled up the number for that variable by the computed totals. Then, the numbers will add to 1.0 or 100%. The results of the Generalized VDC are shown in Table 14 below.

HORIZON		LKLCI	LCPI	LBLR	LIS	LM3	LTD	RANK
LKLCI	12	40%	52%	1%	2%	0%	4%	6
LCPI	12	6%	85%	7%	1%	0%	1%	2
LBLR	12	5%	10%	81%	4%	0%	0%	3
LIS	12	4%	8%	9%	80%	0%	0%	4

LM3	12	3%	3%	0%	1%	77%	17%	5
LTD	12	7%	0%	1%	0%	5%	87%	1
LKLCI	24	35%	59%	1%	3%	0%	3%	6
LCPI	24	7%	84%	7%	1%	0%	1%	2
LBLR	24	5%	11%	80%	4%	0%	0%	3
LIS	24	4%	8%	9%	78%	0%	0%	4
LM3	24	2%	4%	0%	1%	76%	17%	5
LTD	24	7%	0%	1%	0%	5%	87%	1
LKLCI	36	33%	61%	0%	3%	0%	3%	6
LCPI	36	7%	83%	7%	2%	0%	1%	2
LBLR	36	5%	12%	80%	4%	0%	0%	3
LIS	36	4%	8%	10%	78%	0%	0%	4
LM3	36	2%	4%	0%	1%	76%	17%	5
LTD	36	7%	0%	1%	0%	5%	87%	1

Table 14: Generalized Variance Decomposition

Note: *The output of the Generalized VDC indicates that TD is the most exogenous variable for all horizons since it has the highest ranking of 1.*

The results obtained from the Generalized VDC in Table 14 above finally conformed to the results shown by the VECM (see Appendix H1-H6). TD was found to be the most exogenous since it has the highest percentage of variance that is explained by its own past shocks; whereas KLCI was found to be the most endogenous variable since it has the lowest percentage explained by its own past. The rankings for relative exogeneity also did not change indicating stability of the rankings.

However, when the difference in relative exogeneity between the most exogenous and most endogenous variables is very substantial, such as in horizon 36 where it was 54%, this implies that these variables have low cointegration – the variables tend to less affect each other. Even though the earlier EG and JJ tests found that there is cointegration between the variables, yet relative cointegration is small; meaning one unit change in TD will have relatively small change in KLCI.

Finding out that TD is exogenous towards KLCI is very favourable to our case as it ties back to the theory we mentioned earlier – Bank's deposit, which is a function of interest rate, is significant (and has a negative relationship) with the stock market. Hence, our result could benefit the policymakers who are interested in influencing the equity market, at least in the case of Malaysia. If the authority wants to grow the investment on stock market, they should pay attention to the depositors' behaviour and try to tone down the deposit on Islamic banking. This is because TD is the most exogenous variable and thus would have the most impact on KLCI. Since depositors' behaviour is likely determined by the deposit rate, which in turn is a function of interest rate, the authority could also control the interest rate (or BLR in our case) to achieve a similar result, albeit at a more moderate manner. It is then not surprising that our result shows that BLR is the 3rd rank in VDC, and could also influence KLCI. Moreover, Generalized VDC result also suggests that Malaysia's inflation rate, CPI, which is ranked 2nd, would have some bearing on the stock market.

It may be significant to note that the leaders variable, (TD, CPI, and BLR), are all variables controllable by the Central Bank of Malaysia, BNM. Meanwhile KLCI is an indicator that is more relevant for the Securities Commission of Malaysia (SC) and Bursa Malaysia (Bursa). Hence, cross-organisation coordination and cooperation is vital in ensuring Malaysia's economy could grow in a stable manner, where both the capital market and the banking sector could grow hand-in hand, to achieve the desired financial outcome. As such, perhaps it is ultimately the role of Ministry of Finance (MoF) which has oversight over these organisations to ensure that unintended consequence of mishaps in policy-making could be avoided.

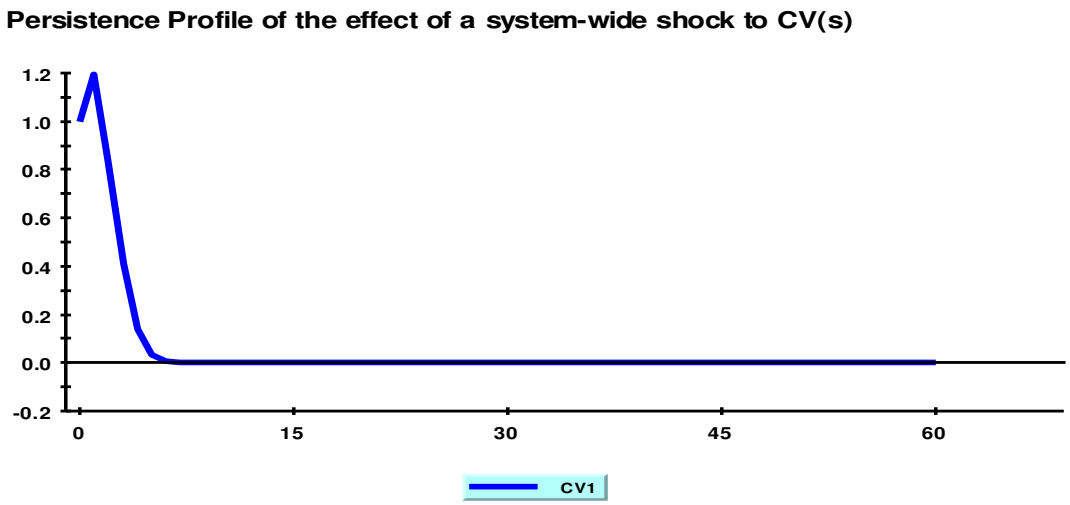
4.7 IMPULSE RESPONSE FUNCTIONS

In order to provide the dynamic response of the stock market to Islamic Bank deposit, the IRFs developed by Pesaran and Shin (1998) have been adopted. IRF produces the same information as VDC, except they are presented in graph.It shows that when the most exogenous variable, TD, is shocked, the other variables response fairly large. While for the most endogenous

variable, KLCI, is shocked, other markets do not react that much. We interpret this by observing the scale and the magnitude of the shocks in each variable.

4.8 PERSISTENCE PROFILE

The PP step is able to estimate the speed of which the economy or the markets return to equilibrium after experiencing a system-wide shock on the cointegrating relations. The difference with the IRF is IRF is tested with a variable specific shock whereas in PP, a system wide shock on the long run relationship is tested (Masih 2013). The chart below shows the PP for the cointegrating equation of this study. The chart indicates that it would take approximately 5 weeks for the cointegrating relationship to return to equilibrium following a system wide shock.



5.0 CONCLUSION

This study made an attempt to examine the impact of Islamic Bank's deposit on the equity market in Malaysia. Author extracted monthly data from BNM's Monthly Statistical Bulletin, spanning from January 2000 until January 2014. Using time series analysis, the 8-step was used for the forecast since all the variables are in I(1) form.

Author first employs the two cointegration test, Engle Granger and Johansen-Juselius to find the existence of any theoretical relationship(s) among the variables under study. The EG test found one cointegration when LKLCI is made the dependent variable, while the JJ test found one cointegration under Max Eigen Value and two cointegrations under Trace statistic. This suggested that Total Deposit on Islamic Banks and the Profit Rate of Islamic Savings have significant long-term equilibrium relationship with Malaysia equity market, KLCI, after taking into account other variables too such as lending rate, inflation and money supply.

Next, author conducted LRSM test and found that in the exact-identifying restriction, the money supply is not significant in the long-run with other variables. Thus, in the over-identifying restriction, author removed that variable in order for the model to be accepted. Moreover, the established equation illustrated that BLR and TD would have negative or inverse relationships towards KLCI, while the remaining variables, IS, M3 and CPI would have a positive relationship with KLCI.

While in the VECM test, results suggested TD, M3 and IS to be exogenous, while CPI, BLR and KLCI to be endogenous. Author then proceed with the Generalized VDC test to find the ranking of each variable, where TD was portrayed to be relatively most exogenous and KLCI was suggested to be relatively most endogenous. Referring back to the result from LRSM, TD also shows an inverse relationship with KLCI.

As for the Generalized VDC, TD was found to be the most exogenous variable since it has the highest percentage of variance that is explained by its own past shock. Whereas KLCI was found to be the most endogenous variable since it has the lowest percentage of variance that is explained by its own past shock. Author performed the Orthogonalized VDC but due to some inherent weaknesses, the result is then ignored.

The IRF, an extension of VDC, is then conducted and it produces the same information, except they are presented in a graph form. The final step, PP, shows how long it would take to stabilise and return to equilibrium if all the variables (system-wide) are shocked by some external

factor. It would take approximately 5 weeks for the cointegrating relationship to return from disequilibrium.

As such, it is safe to say that the overall results of this study, shown through its empirical statistic, supported the author's previous literatures. When depositors deposit their money in banks, particularly Islamic bank in Malaysia, it would have a bearing negative impact towards the (growth) of Malaysia's stock market. The total deposit place on Islamic bank can be relatable to the deposit rate on savings, which is also exogenous as shown from VECM. Meaning the increase in deposit rate which is linked to the total deposit, would mean that deposit instrument is more attractive than investment instrument since depositors can still obtain relatively acceptable high return on the account of relatively lower risk. Hence the previous theory mentioned above can be considered valid. So it is expected that laymen will increase savings and reduces investment.

In conclusion, author would revisit the main research question posed at the beginning of this study, whether or not Islamic deposit would have an impact on the stock market in Malaysia. Based on our qualitative and quantitative analysis, author found the answers to be:

I. It was found that the amount of Total Deposit (TD) in Islamic Bank would Granger-cause the Kuala Lumpur Composite Index (KLCI). In short, the deposit on Islamic Banking would have a significant and negative impact on the equity market, in the case of Malaysia.

Author also discussed on the fact that all the leaders variable, (TD, CPI, and BLR), are variables controllable by the Central Bank of Malaysia, BNM. Meanwhile KLCI is an indicator that is more relevant for the Securities Commission of Malaysia (SC) and Bursa Malaysia (Bursa). Hence, cross-organisation coordination and cooperation is crucial in ensuring Malaysia's economy could grow in a stable manner, where both the capital market and the banking sector is desired to grow hand-in hand, to achieve the best financial outcome. As such, perhaps it is ultimately the role of Ministry of Finance (MoF) which has oversight over these financial organisations to ensure that unintended consequence of mishaps in policy-making could be avoided.

6.0 LIMITATIONS OF THE STUDY AND SUGGESTIONS FOR FUTURE RESEARCH

The author acknowledged that her humble attempt on this study may have many caveats. One of the critical limitations is the lack of sufficient time to examine the relationship between different variable combinations. The choices of variables for this study were eventually based on author's judgement call and her research on different literatures on finding the determinants of deposit and stock markets. Since there is no hard and fast rule on the theory, this leaves the room for other researchers to employ their own expert judgement in variable selection.

In addition, although the number of observations used for this study is considered to be sufficient as it utilised monthly data for a period of 14 years, the study only takes into account one economic cycle, which has experienced only one financial crisis i.e. the Global Financial Crisis, in the case of Malaysia. In exploring new areas of potential research, it is then advisable for future researchers, who are interested to improve this study, to use a longer period data to yield a more refined and stable result which has come across few economic cycles. The study can also be extended further by expanding into a panel data set by including samples from other Muslim countries such as those in Middle East North Africa (MENA), Indonesia, or Brunei, given the availability of data.

Another aspect of this study that was not addressed is author used FTSE Bursa Malaysia (FBM) KLCI which represents the 30 largest companies in FBM EMAS index by full market capitalisation. This effectively means the proxy takes into account equity counters of both conventional and Shariah-compliant stocks. On the other hand, our Total Islamic Deposit and Islamic Savings Profit Rate focused on the Shariah-compliant deposit only. Therefore, this present opportunity for future researchers to narrow down the study by looking at Shariah-compliant indices such as FBM Hijrah Shariah Index – the 30 largest Shariah-compliant companies in FBM EMAS, or the FBM EMAS Shariah Index – all the Shariah-compliant constituents of the FBM EMAS that meet the screening requirements of the Securities Commission's (SC) Shariah Advisory Council (SAC).

Furthermore, the focus study on Shariah-compliant indices can be expanded regionally and internationally, due to the availability of international index providers that benchmark Shariah-compliant equity investment including but not limited to Dow Jones, FTSE, S&P and MSCI. These Shariah indices providers may have some variant forms of stock screening norms and methodologies.

Nevertheless, the author acknowledges that as of the time this paper is written, availability of Islamic finance related data may be challenging as the industry is still at its nascent stages of development. However, as time passes by and more data can be gathered, this opens the door for future research areas.

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