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Equity-based Financing, Deposit and Investment accounts: Evidence of Islamic banks in Malaysia

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1.0 Introduction

For the past few years many Islamic banking jurisdictions have registered double-digit growth rates surpassing their conventional counterparts. There is a great prospect for further growth given the fact that there are many potential markets with large Muslim population that remained untapped. At the same time, the overall market penetration is still low in existing markets or not yet achieved the banking penetration levels of advanced countries. However, a closer look suggests that the market dynamics are changing. There are two indicators that warrant Islamic banks to relook at their products; declining growth rates and eroding profitability. The Islamic Financial Services Board (IFSB) Islamic Financial Services Industry (IFSI) Stability Report dated May 2016 reported the Islamic funds' assets have contracted by 6.3% to USD71.3 billion from USD75.8 billion a year ago. The key important reason for the relatively modest performance was the exchange rate depreciation. It can be deduced therefore, there is an urgent need to revisit the Islamic financial products as an alternative banking platform given the declining growth rates and eroding profitability. In particular, the need to revisit equity-based financing as the equity-based financing is considered a core activity for Islamic banking. This is because in the intermediation of the equity-based financing, its principle of risk-sharing clearly fulfils one of core values in Islamic finance.

Generally, the operations of Islamic banks have given rise to not only credit risk but also equity investment risk which emanates from the profit-sharing investments which are unique to Islamic banking. However, in spite of the important of risk management pertaining to profit and loss sharing instruments, research to date has tended to focus more on risk management of debt-based financing instruments such as murabahah, salam and istisna. As such Orhan Astrom (2013) draw our attention the evaluation of equity-based financing PLS instruments is neglected. In this respect, the aim of this study is to find an association between the sources of funds and the financing and investment funds. In doing so, the following research questions will be delved into i.e. the association between deposits and investment accounts, and financing funds.

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From an inaugural study by the Bahrain-based General Council for Islamic Banks and Financial Institutions (CIBAFI), they discovered - while the bankers recognized the importance to the industry of equity-based financing, such as Profit Loss Sharing Investment Account (PSIA) - the bankers are concerned with capabilities of Islamic banks to manage and absorb risk associated with equity-based financing (Belatik, 2015). Because of this reason, the bankers surveyed who are mainly from - the Gulf Cooperation Council (GCC), the Middle-East, and Asia - conclude that equity-based financing, deposits and investment require a strong alignment with internal risk management policy, appetite and capacity (Belatik, 2015). Interestingly the bankers made it clear that this type of financing is difficult to execute, but they also indicated very much that they would like to offer it (the equity-based financing, deposits and investments). Thus this study is timely to uncover the association between the deposit and investment accounts on the liability side of Islamic banks' balance sheet, and the equity-based financing on the asset side. Also, this study contributes to existing body of knowledge on the association to give greater clarity on profitable exit routes for equity-based financing. This is for better alignment of return achieved on financing in order to satisfy the investment account holders' expectations. Furthermore, the recent funding shifts from Profit-sharing investment deposits to Shariah-compliant capital and profit-guaranteed term deposits has caused Islamic banks to face the same risks from maturity mismatch also warrants undertaking this study. Also, this study provides additional evidence linking the need to bridge the gap between theory and practice. As it has been conclusively shown by Sarea and Mohd Hanefah (2013) many remaining issues relating to shariah compliance are preventing Islamic banks from promoting their products globally.

The remainder of the paper is organized as follows: Section 2 is a review of literature and Section 3 is a discussion on data and research methodology. Section 4 displays graphs of the variables - financing, deposit and investment, while section 5 discusses the empirical regression, Unit root and Co-integration tests results. Section 6 concludes the paper.

2.0   Literature Review

In a study on principles of risk management of Islamic banks internationally, Romzie and Abdul Rahim (2015) reveal a profit-sharing mode of financial intermediation in funds management. In the intermediation, the profit-sharing mode is not only in sources of funds (customers' deposits, investment funds, and savings accounts) but also in financing and investment activities. It has been suggested further by the authors that risks in the profit-sharing financing and investment activities should be shared. The authors draw our attention to the highest variation in the risk management practice in equity financing investments among the unique risks in Islamic banks. The results obtained from the questionnaires showed the highest standard deviation was for the practice of equity financing investment risk management (0.793), but no further explanations were given as to the reasons. The findings might have been far more useful if the authors had developed an association between the sources of funds (deposits from customers, investment funds, and saving accounts) and the financing and investment contracts. Further investigation into the association would be of great help to determine the efficiency of the intermediation in steering from customers' deposits and investment funds on the liability side of the balance sheet, to equity financing investment contracts on the asset side. It will offer

some insight into the efficiency of the equity financing investment contracts towards growth-enhancing and productive social activities.

Jamalludin (2012) points out the intermediation of deposits accounts and investment funds from the liability side of the balance sheet to equity financing investment contracts on the asset side makes the Islamic bank balance sheet as a "pass through" arrangement. This is similar to funds management, with the difference there are multiple portfolios of investment contracts on the asset side of the balance sheet. In the intermediation, the return to accounts depositors and investment funds account holders is linked to the return of investment contracts from the asset side. This feature, as Jamalluddin (2012) describes removes the typical asset-liability mismatch exposures in the balance sheet.

In this study, the scope of analysis is limited only to equity-based participatory modes of investment contracts. They are mudharabah ("profit-sharing & loss-bearing") and musharakah ("profit & loss sharing") contracts, which are principally equity-based financing contracts. They were commonly practiced during the pre-Islamic Arab Peninsula, according to Orhan Astrom (2013). After the appearance of Islam, their practice continued with an emphasis on social justice and the non-existence of riba and gharar, the author adds. However, so far too little attention has been paid to the intermediation from customers' deposits and investment funds to equity financing investment contracts on the asset side of the balance sheet. Because of this, many Islamic banks are under pressure including from shariah boards to evolve towards more risk-sharing instruments such as mudharabah and musyarakah. In other words, to evolve away from heavy reliance on debt instruments such as murabahah. In his review of the literature on history of evolution of banking industry, Omar (2015) acknowledges Islamic banks restrict themselves to debt-based products while ignoring musyarakah and mudharabah as the existing structural framework is not designed to handle the risks and requirements to promote the equity-based products. As such, a new basis of structural evaluation for Islamic financial institutions is required to make the institutions more compatible to the ethos of Islamic economics, the author argues. The reports by Global Islamic Banker's Survey Risk Perception, Growth Drivers, and Beyond (November 2015) also provides additional evidence with respect to equity-based financing as a core activity that clearly fulfils the principle of risk-sharing and cost-bearing between a bank and its customer. It's one of the core values of Islamic finance. Turning back to Orhan Astrom (2013), central to his new approach to credit risk management process for profit & loss sharing instrument contracts is social justice and benefit for the depositors' deposits and investment fund holders. The author subscribed to the belief that the ultimate goal of all economic activities in Islam is to contribute to the society.

This study excludes its scope of analysis on debt-creating modes of financing contracts such as murabahah (sales contracts at a profit margin), ijarah (leasing), salam and istisna, and other non-mudharabah contracts. They are commercial instruments, and Islamic banks play a commercial role rather than a traditional role of intermediation in the intermediation of profit-loss sharing assets. Further, murabahah, ijarah, salam and istisna are not based on the principle of Profit and Loss Sharing (PLS). Instead they are based on a transfer of ownership of the underlying assets from the banks to the customers (Hamza and Saadaoui, 2013).

In a typical mudharabah contract, the depositor or "rabbul-mal" is the financier or provider of funds, while the other party, the "mudharib" provides the entrepreneurship and effort to run the business. Further, the provider of funds cannot interfere in the work of the mudharib as it is the exclusive right of the mudharib. Any profit derived from the business is shared by the two parties according to a predetermined profit-sharing ratio, while any loss is undertaken by the financier. This is the case if it is not due to negligence, misconduct by the mudharib or breach of contracted terms.

In a review of Profit-Sharing Investment Accounts (PSIA) from an accounting perspective, Al-Shattarat and Atmeh (2016) reveal that mudharabah contracts may be employed on both sides of Islamic banks balance sheet. On the liability side, the contracts may be employed in the Deposit accounts, and the Profit-Sharing Investment-fund Accounts (PSIA), and on the asset side, in the equity financing investment through Profit Loss-Sharing (PLS) contracts. The musharakah contracts ("profit and loss sharing") may also be on the asset side of the balance sheet.

Although mudharabah contracts may be employed on both sides of the balance sheet, Abdoulaye Mbow (2011) comparative study of returns on mudharabah deposits and equity showed the use of mudharabah financing on the asset side of the balance sheet of Islamic banks is minimal. Interestingly, in his exploratory study on determinants of profitability of Islamic banks, Haron (2004) discovered the more investment funds on the liability side of the balance sheet, the more return from equity investment contracts is received from the asset side. More recently, Grassa (2016) also documented positive association between investment funds and income derived from profit-loss sharing (PLS) on the asset side of the balance sheet. As such, it is becoming increasingly difficult to ignore what this study sets out to determine, the association between the sources of funds from the liability side of the balance sheet (deposit accounts and investment funds) and the uses of funds for investment contracts on the asset side of the balance sheet.

In a related study on deposits, and the effect of risk-taking behavior on capital structure, Hamza and Saadaoui (2013) discover that increasing deposits on the liability side is likely to influence more risk-taking behavior. This may result in a negative relationship between the deposits and bank capitalization. It may increase insolvency risk, the authors conclude on the basis of several empirical studies highlighting causality between excessive risk-taking behavior and bank capitalization. Such an exposition of negative association in risk-taking behavior with bank capitalization assumed the existence of asymmetric information and moral hazard problems in the intermediation.

In view of structural properties of mudharabah contracts, where investors are prohibited from participating in mudharabah contract while losses are borne totally by providers of funds, capital value and rate of returns are not guaranteed. Islamic banks may use two types of reserves to "smoothen" returns to investment account holders (IAH). Hamza and Saadaoui (2013) explain the reserves also serve to overcome Displaced Commercial Risk (DCR) in the intermediation of Islamic banking due to pressure to maintain competitive returns to the investment account holders (IAH). The first type of the reserves is the Profit Equalization Reserve (PER), an amount appropriated out of mudharabah income before allocating share for mudharib. It serves to maintain a specific level of returns to depositors. The second type of the reserves is the Investment Risk Reserve (IRR) an amount appropriated out of income of IAH

after allocating share for mudharib to guarantee the deposits principal to the depositors. It caters against future losses for the depositors. The reserves are effectively smoothing mechanisms to mitigate the variability of returns. The issue that the reserves can be used for income smoothing purposes has been raised by Al-Shattarat and Atmeh (2016) in their study on applicability of mudharabah. Difficulties arise, however, when the reserves can be used for income smoothing. It undermines the notion of Profit-Loss Sharing (PLS), the authors argue. According to the authors, Islamic jurists permitted this by relying on a "tabarru" - donation, charity or gift which cannot be taken back.

Turning now to a study by Al-Kayed, Syed Mohd Zain and Duasa (2014) on the relationship between capital structure and performance of Islamic banks, the authors subscribed to the belief that Islamic banks are considered as an-all-equity-based institutions. This is due to their unique nature of deposits. On the asset-side, from the Profit-Loss sharing (PLS) contracts-based financing, Daher, Masih and Ibrahim (2015) warn of exposures to equity investment risks to the banks' capital buffers. It becomes increasingly important therefore to assess the association between sources of funds, and financing and investment activities pose to the equity investment risks.

In a related study, Orhan Astrom (2013) draws our attention on the asset side of the balance sheet of Islamic banks there are also credit and capital impairment risks in addition to equity investment risks. The credit risk according to the author is the risk that the mudharib may not fulfill the obligations under the mudharabah contracts. The author has gone some way towards enhancing our understanding that there is a connection between the equity investment risks, the credit and the capital impairment risks. The use of the Profit-Loss Sharing (PLS) equity instruments may pose capital impairment risk, but that can only be treated as credit risk if the capital impairment arises due to misconduct and negligence, the author concludes. On the other hand, the credit risk is different in musharakah contracts from the mudharabah contracts because each partner in the musharakah contracts has control over management of the musharakah contracts.

If we now return to Daher, Masih and Ibrahim (2015), they describe the activities in Profit Loss-Sharing (PLS) principally as participatory forms of financing. In this respect, according to Al-Kayed, Syed Mohd Zain and Duasa (2014), because the capital value and rate of returns are not guaranteed, it creates incentives for risk-taking in investment contracts. As such, the authors conclude based on the study of the relationship between capital structure and performance of Islamic banks, tackling the unique risks of Islamic banking will requires adequate capital and reserves. However, such an exposition by the authors is inadequate because it does not acknowledge the significance of the association between the sources of funds in the liability side, and the equity financing investment contracts on the asset side. This study sets out to uncover that association between the sources of funds on the liability side of the balance sheet, and the equity financing investment contracts on the asset side.

While there is an abundance of study on profitability of Islamic banks, they make no attempt to devise a time-series model linking the sources of funds on the liability side of the balance sheet with the equity financing investment contracts on the asset side. Also, many of the studies tend to overlook the fact that Profit and Loss Sharing Accounts (PSIA) mudharabah contracts may be employed on both sides of the balance sheet. However, due to its bias in favor of the mudharib (agent manager) exposing the investors

or providers of funds to bear all losses (unless there is a negligence or misconduct by the mudharib), it is less adopted as a financing contract by Islamic banks.

Turning now to a current study analyzing an accounting perspective of Profit Sharing Investment Accounts (PSIA) by Al-Shattarat and A Atmeh (2016), they identify serious flaws in the use of mudharabah as a mechanism for mobilizing funds. One of which is when mudharabah contracts are not liquidated to distribute profit. Traditionally, mudharabah contracts were used for a one-limited-time-contract, and they ended by liquidation of the contracts. On the other hand non-PLS contracts are non-participatory activities (Hachicha and Amar, 2015) whose impact is short term. The authors concluded because Islamic banks in Malaysia engage much more in non-participatory activities they have not performed effectively their main role as financial intermediaries for economic growth. As a result, the impact of the Islamic finance on the economic growth remains ambiguous, according to them.

In an effort to encourage Islamic banks to diversify their product offerings, beginning from 25 May 2015 customers in Malaysia are given the options to choose either investment fund or deposit accounts. Those who choose the investment fund accounts can invest in portfolio of assets that can potentially give them higher returns than the deposit accounts.

3.0 Data and Research methodology

In this study on the association between the sources of funds, and the equity-based financing investment contracts, the study uses data taken from all full-fledged Islamic banks under the Association of Islamic Banking Institutions Malaysia (AIBIM). There are 10 domestic banks, 9 locally incorporated foreign banks, 4 development financial institutions, and 2 international financial institutions in the association. Because all the banks in the study are from Malaysia, there is no possibility of heterogeneity problems due to differences in accounting treatments across countries and banking regulations. The data cover financial reporting periods from 2005 to 2016 Quarter 1 (Q1) - where they are available, totaling 12 years of observations.

The data are extracted from published annual reports and interim financial statements of the banks, unless otherwise specified from other sources, and they are reported in thousands of Ringgit Malaysia (RM'000). The list of Islamic banks included in the study, and the corresponding periods of observation are tabulated in Table 3.0.1 below.

Table 3.0.1: Islamic banks

No.	Domestic Banks	Years of observation
1.	Affin Islamic Bank (Malaysia) Berhad	31/12/2010 - 31/12/2015[A]
2.	Alliance Islamic Bank (Malaysia) Berhad	31/3/2009 - 31/3/2016
3.	AmIslamic Bank (Malaysia) Berhad	31/3/2005 - 31/3/2016[B]
4.	Bank Islam (Malaysia) Berhad	30/06/2005 - 31/3/2016[C]
5.	Bank Muamalat (Malaysia) Berhad	31/12/2005 - 31/3/2016
6.	CIMB Islamic Bank (Malaysia) Berhad	31/5/2009 - 31/3/2016[D]
7.	Hong Leong Islamic Bank (Malaysia) Berhad	30/6/2006 - 31/3/2016[E]
8.	Maybank Islamic Bank (Malaysia) Berhad	30/6/2006 - 31/03/2016[F]
9.	Public Islamic Bank (Malaysia) Berhad	31/12/2008 - 30/06/2016[T]
10.	RHB Islamic Bank (Malaysia) Berhad	31/12/2005 - 31/12/2015[G]
Domestic Development Financial Institutions		**Years**
1.	Bank Kerjasama Rakyat (Malaysia) Berhad	31/12/2007 - 31/12/2015[H]
2.	Bank Simpanan Nasional (BSN)	Excluded due to no equity-based financing [I]
3.	MBSB (Malaysia) Berhad	31/12/2006 - 31/06/2016[J]
4.	Agrobank (Malaysia) Berhad	Excluded due to no equity-based financing [S]
Locally Incorporated Foreign banks		
1.	Al-Rajhi Banking & Investment Corporation (Malaysia) Berhad	31/12/2006 - 31/3/2016[K]
2.	Asian Finance Bank Berhad	31/12/2007 - 31/12/2015[L]
3.	BNP Paribas (Malaysia) Berhad (Islamic Banking Business)	Excluded due to no equity-based financing and no mudharabah fund deposit and investment
4.	Bank of Tokyo-Mitsubishi UFJ (M) Bhd	Excluded due to no equity-based financing and no mudharabah fund deposit and investment
5.	Citibank (M) Berhad	31/12/2007 – 31/3/2016[N]
6.	HSBC Amanah (M) Berhad	31/12/2009 – 31/3/2016[O]
7.	Kuwait Finance House (Malaysia) Berhad	31/12/2005 – 31/3/2016[P]
8.	OCBC Al-Amin Bank Berhad	31/12/2011 – 31/3/2016[Q]
9.	Standard Chartered Saadiq Berhad	31/12/2008 – 31/3/2016[R]
International Financial Institutions		
1.	Alkhair International Islamic Bank Berhad	Excluded due unavailable data
2.	PT bank Muamalat Indonesia Tbk	Excluded due to unavailable data

Source: [A] Annual Report 31/12/2015
[B] AMMB Holdings Bhd. Islamic banking business 31/3/2016
[C] 9 months Unaudited Interim Financial Statements ended 31/3/2016
[D] CIMB Islamic Interim Financial Statements 31/3/2016
[E] Unaudited Statement of Financial Position as at 31/3/2016
[F] Unaudited Income Statement Maybank Group, the Operations of Islamic Banking 31/3/2016
[G] Financial Year Ended 31/12/2015
[H] Annual report 31/129/2015
[I] Annual Report 31/12/2014Operations of Islamic Banking
[J] Unaudited Consolidated Statements of Financial Position Islamic Business 31/06/2016
[K] Interim Financial Statements ended 31/3/2016
[L] Financial Year Ended 31/12/2015
[M] 31/12/2015 Operations of Islamic Banking
[N] Unaudited Islamic Banking Operations 31/03/2016

3.0.2   Model and variables specifications

To determine the association between the sources of funds, and the equity-based financing investment contracts, the model and variables specifications are as follows:

Log FINANCING $_t$ = B$_0$ + B$_1$ Log DEPOSIT $_t$ + B$_2$ Log INVESTMENT $_t$ + ε_t

The variables are constructed such that where Log FINANCING is the natural logarithm of FINANCING. The category includes equity-based financing only such as Mudharabah and Musharakah contracts. This category excludes other non-equity based contracts such as Murabahah, Ijarah, Bai Bithaman Ajil, Qard and Istisna.

While, Log DEPOSIT is the natural logarithm of DEPOSIT accounts and Log INVESTMENT is the natural logarithm of INVESTMENT accounts, both of which are principally, mudharabah funds. The category excludes non-mudharabah funds.

4.0   Line Graphs of FINANCING, DEPOSIT and INVESTMENT

For each individual variable of financing, deposit and investment, a line graph is plotted. So, there is one graph each for financing, deposit and investment as in Figure 4.0.1 below.

Figure 4.0.1: Individual line graphs of financing, deposit and investment for years 2005 - 2016

FINANCING

DEPOSIT

Years 2005 - 2016

INVESTMENT

Years 2005 - 2016
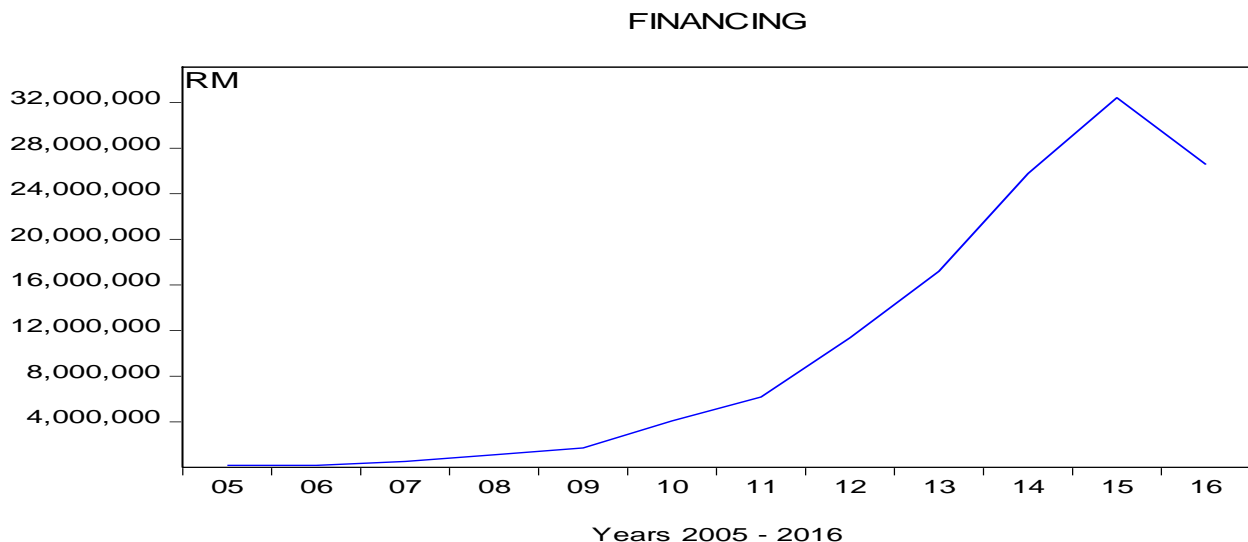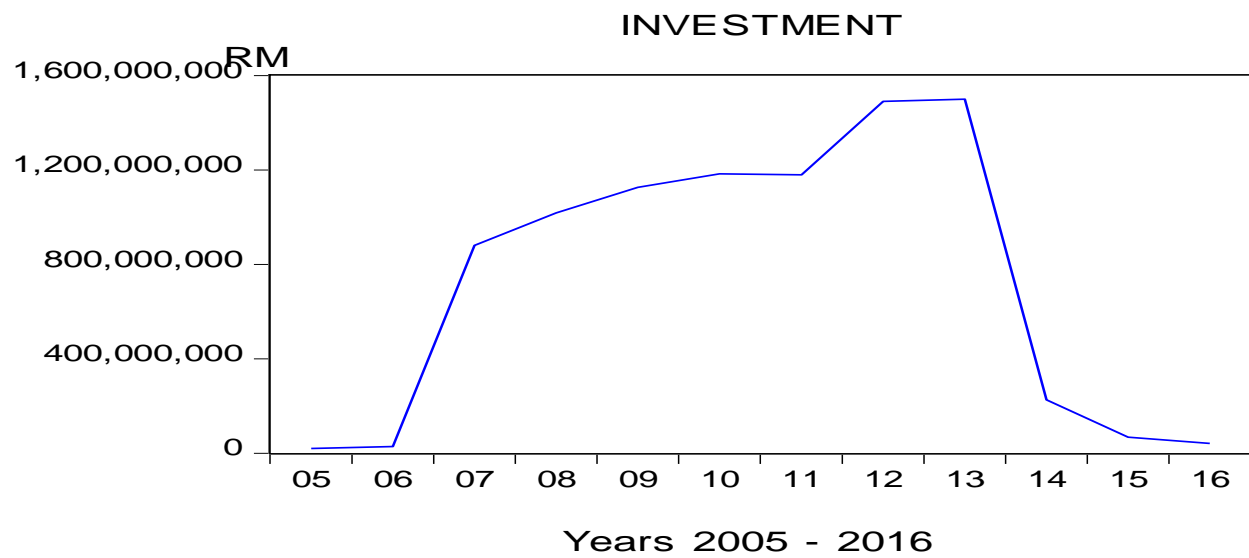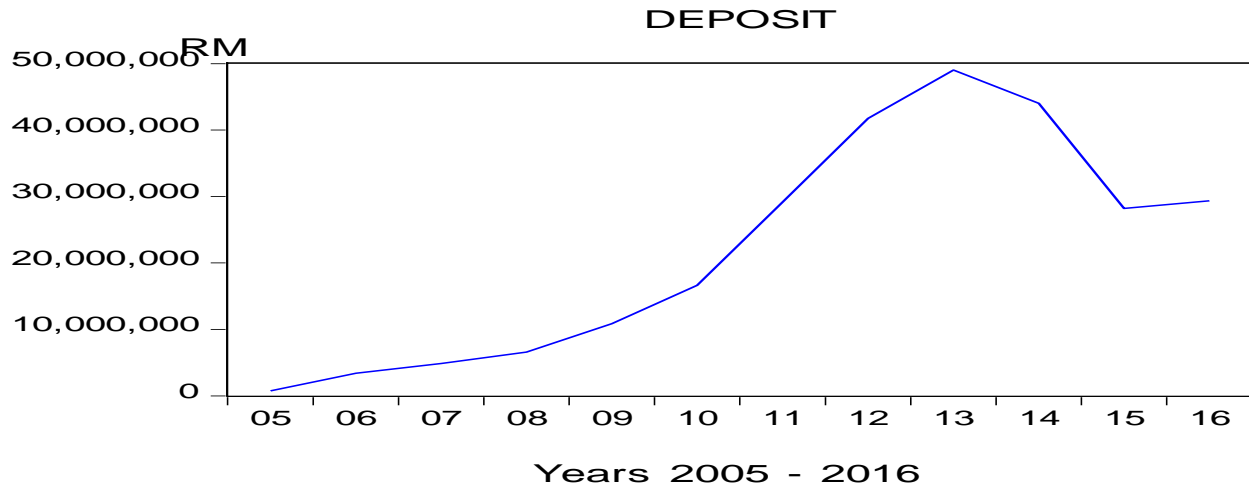
All the individual line graphs above show the pattern of Time Series data. In each of the line graphs, the characteristic of trend is persistent in long term movement of the variables, FINANCING, DEPOSIT and INVESTMENT over time from 2005 to 2016.
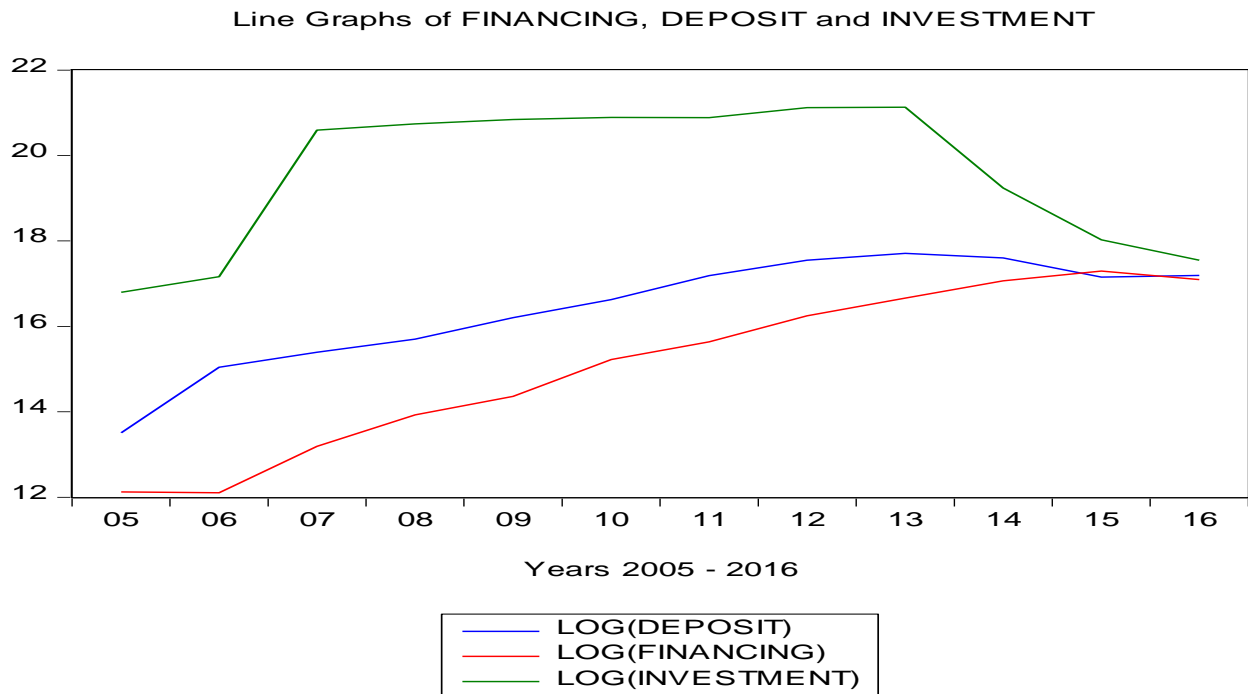
Meanwhile, figure 4.0.2 below displays the line graphs of financing, deposit and investment side by side for comparison.

Figure 4.0.2: Line graphs of financing, deposit and investment for years 2005 - 2016 side by side

In particular for INVESTMENT, an informal inspection of the graphs suggest that the INVESTMENT of Islamic banks in Malaysia from 2005 to 2016, the series evolve around trends more complicated than a simple linear one, with the possibility of more than one slope shifts or breaks in the trend function. The INVESTMENT line graph shows a trend break in 2013.

5.0   Regression results and Discussions

Using the logarithmic values for financing, deposit and investment, different methodologies are employed in Time Series analysis so that the robustness of co-integration result is guaranteed.

The regression model in the study is:

Log FINANCING $_t$ = B_0 + B_1 Log DEPOSIT $_t$ + B_2 Log INVESTMENT $_t$ + ε_t.

As in the classical linear regression model (CLRM) in the context of Time Series analysis, the following assumptions, among others are;

- ✓   the regression model is linear in coefficients,
- ✓   is correctly specified,
- ✓   has an error term (disturbance)
- ✓   explanatory variables - deposit and investment - are uncorrelated with the error term
- ✓   no multi-collinearity, and
- ✓   "n" (sample size = 12 years from 2005 to 2016) is > "k" (number of parameters =3).

The Ordinary Least Square (OLS) has the desirable property of a Best Linear Unbiased Estimator (BLUE). The results of the Ordinary Least Square (OLS) are as tabulated in table 5.0.1 below.

Table 5.0.1 Ordinary Least Square (OLS)

Dependent variable	FINANCING			
Method	Ordinary Least Squares (OLS)			
Sample	2005 - 2016			
Included observation	12			
Independent variables	Coefficient	Std. Error	t-Statistic	Prob.
DEPOSIT	0.617440	0.099936	6.178373	0.0002
INVESTMENT	-0.011454	0.002840	-4.032917	0.0030
Constant	5357439	2992662	1.790192	0.1070
R-squared	0.828986		Mean dependent var	10613629
Adjusted R-squared	0.790983		S.D. dependent var	11888618
S.E. of regression	5435286		Akaike info criterion	34.06704
Sum squared resid	2.66E+14		Schwarz criterion	34.18827
Log likelihood	-201.4022		Hannan-Quinn criter	34.02216
F-statistic	21.81363		Durbin-Watson stat	1.481974
Prob (F-statistic)	0.000354			

Note: FINANCING is equity-based financing, DEPOSIT is deposit, and INVESTMENT is investment

In the above results, the predicted equation is FINANCING=0.617440(DEPOSIT)-0.011454(INVESTMENT) + 5,357,439(CONSTANT) indicating that Financing is predicted to increase by RM0.617440 when deposit variable increase by RM1,000 and decrease by RM0.011454 when investment variable increase by RM1,000.

Furthermore, the Deposit is positively related to Financing; and is statistically significant with a Prob. (0.0002). Investment is negatively related to Financing and is statistically significant with a Prob. (0.0030). The t-statistic of above 2 or below -2 is considered significant at 95% confidence level to reject the null hypothesis with 95% confidence, and can be concluded the variables (Deposit (with t-statistic of 6.178373 and Investment with t-statistic of (-4.032917) have a statistically significant effect on the Financing at 95% confidence level. In addition, the regression coefficient of R^2 value of 0.828986 and the adjusted R^2 value of 0.790983 show a fit of the regression model to the data indicating 82.8986% of the variance of Financing is explained by Deposit and Investment.

5.1   Unit root and Co-integration tests

In Time Series data, the stationary test is important to be conducted before regression to determine if shocks have permanent or transitory effects. In the case of Unit root test, it is because many asymptotic distributions change. So, Unit root test is conducted before regression otherwise a spurious regression will result with a model that is not acceptable, and the coefficients are not Best-Linear-Unbiased-Estimators (BLUE). Also, co-integration tests are conducted to determine the association among the variables, FINANCING, DEPOSIT and INVESTMENT.

(a)   Unit root test

(i)   FINANCING

In the case for FINANCING, a Unit root test is computed to find out whether or not FINANCING has a Unit root. The null hypothesis is that FINANCING has a Unit root. Intuitively, the null hypothesis is that FINANCING is non-stationary. And, the alternate hypothesis is that the FINANCING is stationary. The most widely-used method for Unit root test is the Augmented Dickey-Fuller (ADF) test.

In Table 5.1.1 below is the output of the Unit root test for FINANCING where the dependent variable is "Difference of LOG FINANCING" which is regressed on; (1) LOG FINANCING (-1) the first lag, (2) CONSTANT; and (3) TREND.

Table 5.1.1 Unit root test output (ADF) on FINANCING _(test at level data; no difference in the variable; and includes Trend and intercept)_

Null Hypothesis: LOG(FINANCING) has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 0 (Automatic - based on SIC, max lag=0)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-0.195881	0.9808
Test critical value	1% level		-5.124875	
	5% level		-3.933364	
	10% level		-3.420030	
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LOG(FINANCING)) Sample (adjusted): 2005 2016 Included observations: 11 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(FINANCING(-1))	-0.086642	0.442323	-0.195881	0.8496
CONSTANT	1.755530	5.097086	0.344418	0.7394
@TREND ("2005")	-0.002192	0.251863	-0.008703	0.9933
R-squared	0.211930	Mean dependent variable		0.451930
Adjusted R-squared	0.014912	S.D. dependent var		0.371075
S.E. of regression	0.368298	Akaike info criterion		1.067153
Sum squared resid	1.085149	Schwarz criterion		1.175670
Log likelihood	-2.869344	Hannan-Quinn criter		0.998749
F-statistic	1.075691	Durbin-Watson stat		1.808336
Prob (F-statistic)	0.385709			

Because the Prob. values of the coefficients for the variables LOG (FINANCING (-1)) is 0.8496, CONSTANT is 0.7394 and TREND is 0.9933, where by all the values are > 0.05, they are all not statistically significant.

Also because the t-statistics of 0.195881 (in absolute value) is less than 5.124875 (in absolute value) critical value at 1% level; we can accept the null hypothesis that FINANCING has a Unit root (i.e. FINANCING is non-stationary) ("_non-stationary means the data series does not evolve around a constant_

mean"). Therefore, we cannot use the FINANCING data in its present form. We have to modify the FINANCING equation before we use it in a regression.

So, proceeding to modify the FINANCING equation with first difference, the output is as in Table 5.1.2.

In the test for unit root in the first difference, the "Difference of LOG FINANCING" is regressed on; (1) DIFFERENCE IN LOG FINANCING (-1) the first lag, (2) CONSTANT; and (3) TREND.

Table 5.1.2 Unit root test results (ADF) on FINANCING *(first difference in the variable and includes Trend and Intercept)*

Null Hypothesis: D(LOG(FINANCING)) has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 0 (Automatic - based on SIC, max lag=0)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-6.180979	0.0038
Test critical value	1% level		-5.295384	
	5% level		-4.008157	
	10% level		-3.460791	
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LOG(FINANCING),2)				
Sample (adjusted): 2007 2016				
Included observations: 10 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(FINANCING(-1)))	-1.273143	0.205978	-6.180979	0.0005
CONSTANT	1.329787	0.204450	6.504229	0.0003
@TREND ("2005")	-0.106101	0.021637	-4.903675	0.0017
R-squared	0.878951	Mean dependent variable		-0.018164
Adjusted R-squared	0.844366	S.D. dependent var		0.484267
S.E. of regression	0.191046	Akaike info criterion		-0.229282
Sum squared resid	0.255489	Schwarz criterion		-0.138507
Log likelihood	4.146410	Hannan-Quinn criter		-0.328863
F-statistic	25.41400	Durbin-Watson stat		2.074734
Prob (F-statistic)	0.000617			

In the above table because the Prob. values of the coefficients for the variables D(LOG(FINANCING (-1))) is 0.0005, CONSTANT is 0.0003 and TREND is 0.0017, where by all are < 0.05, they are all statistically significant.

Also, as the t-statistics of 6.180979 (in absolute value) is higher than 5.295384 (in absolute value) critical value at 1% level; higher than 4.008157 (in absolute value) critical value at 5% level and/or higher than 3.460791 (in absolute value) critical value 10% level; we can reject the null hypothesis that first-difference FINANCING has a Unit root. In other words we accept the alternate hypothesis that the first-difference FINANCING is stationary.

In addition, the Prob. value is 0.0038 indicates there is 0.38% chance of making an error. Intuitively, the first difference FINANCING data is stationary. In summary, from the two tables above, for FINANCING it can be concluded the data is non-stationary in the level, but stationary in the first difference.

For the FINANCING equation, as the Constant and Trend Prob. values are 0.0003 and 0.0017 respectively - less than 0.005 - they all are statistically significant, and to be included in the FINANCING equation.

Therefore, the modified first-difference FINANCING equation is D(LOG(FINANCING),2) = -1.273143 D(LOG(FINANCING(-1)))+ 1.329787 CONSTANT -0.106101TREND. And a line graph of a stationary first-difference FINANCING is as below in Figure 5.1.1

Figure 5.1.1 Line graph of a stationary first-difference FINANCING

FINANCING (Stationary)
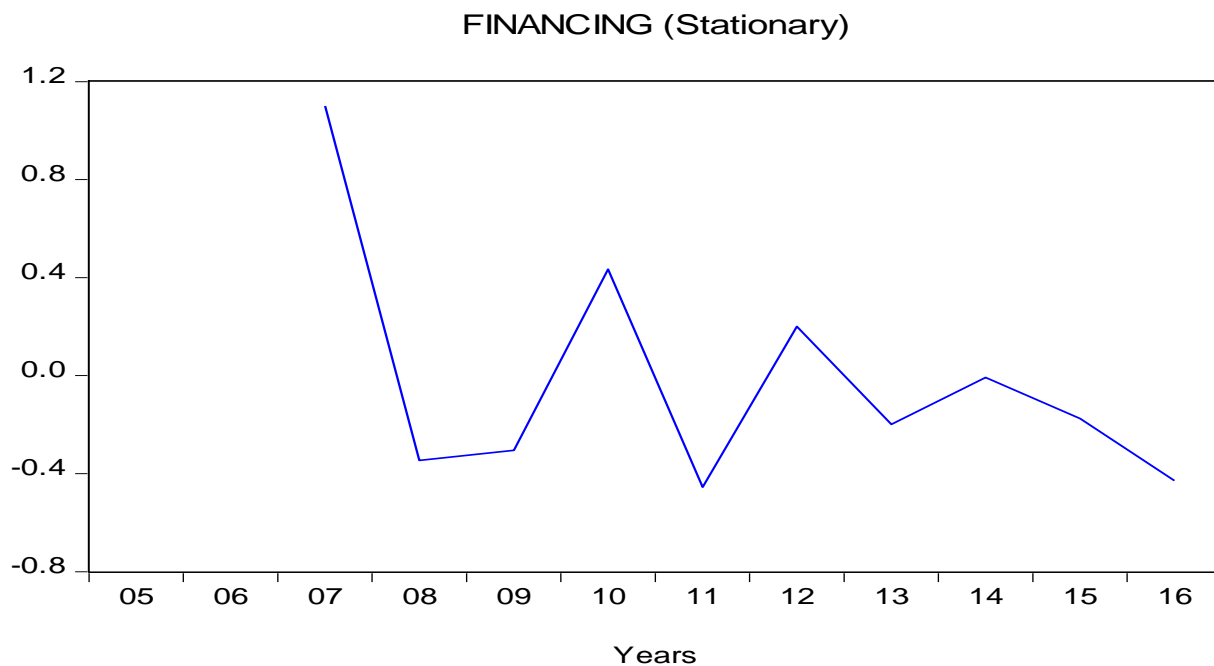
In the line graph above, the FINANCING's level variable in first-difference becomes stationary. If we place a line across a zero value along the y-axis, the values of FINANCING go up and down but they quickly return back to a zero-mean.

(ii)   DEPOSIT

For DEPOSIT the results of the Unit root tests is in table 5.1.3 as follows:

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Table 5.1.3 Unit root test results (ADF) on DEPOSIT *(2nd difference in the variable and excludes Trend and Intercept)*

| Null Hypothesis: D(LOG(DEPOSIT),2) has a unit root				
Exogenous: None				
Lag Length: 0 (Automatic - based on SIC, max lag=2)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.884772	0.0003
Test critical value	1% level		-2.847250	
	5% level		-1.988198	
	10% level		-1.600140	
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LOG(DEPOSIT),3)				
Sample (adjusted): 2008 2016				
Included observations: 9 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(DEPOSIT(-1))2)	-0.992016	0.203083	-4.884772	0.0012
R-squared	0.709309	Mean dependent variable		0.184787
Adjusted R-squared	0.709309	S.D. dependent var		0.493531
S.E. of regression	0.266091	Akaike info criterion		0.294483
Sum squared resid	0.566436	Schwarz criterion		0.316397
Log likelihood	-0.325174	Hannan-Quinn criter		0.247193
Durbin-Watson stat	1.726235			

As the t-statistics of 4.884772 (in absolute value) is higher than 2.847250 (in absolute value) critical value at 1% level; higher than 1.988198 (in absolute value) critical value at 5% level; and higher than 1.600140 (in absolute value) critical value at 10% level, we can reject the null hypothesis that 2nd-difference DEPOSIT has a Unit root. In addition, the Prob. value is 0.0003 indicates there is 0.03% chance of making an error. Intuitively, the second-difference DEPOSIT data is stationary.

For the DEPOSIT equation, it was determined the Constant and Trend are not significant, so they are omitted from the equation for the DEPOSIT.

The modified second-difference equation for DEPOSIT is D(LOG(DEPOSIT),3)= -0.992016 D(LOG(DEPOSIT(-1))2). For DEPOSIT, it is determined the data is non-stationary in the level and first-difference. It is stationary in the second-difference. And a line graph of a stationary second-difference DEPOSIT is as below in Figure 5.1.2

Figure 5.1.2 Line graph of a stationary second-difference DEPOSIT

DEPOSIT (Stationary)
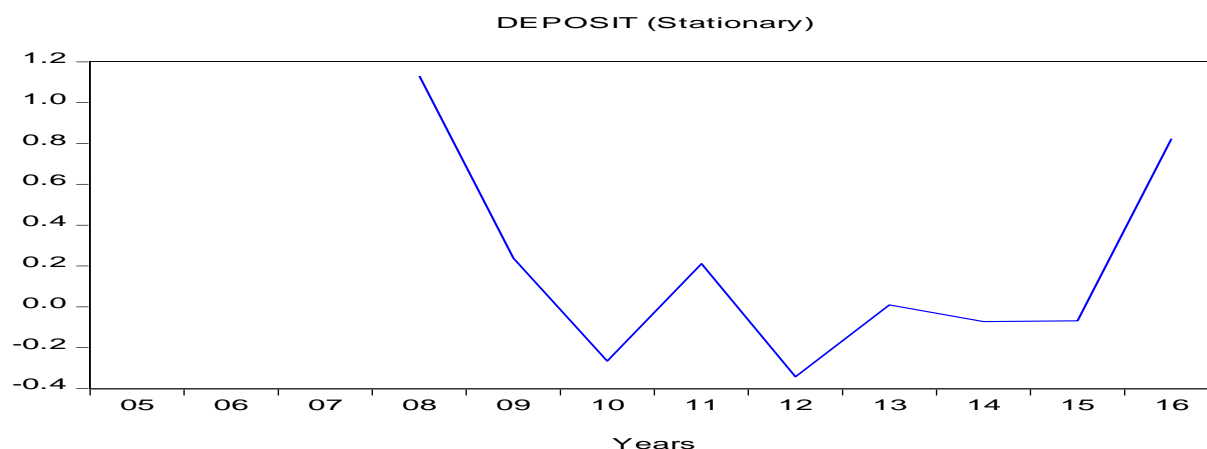
In the line graph above, the DEPOSIT's level variable in second-difference becomes stationary. The data generating process is equal to 0 and if we place a line across a zero value along the y-axis, the values of DEPOSIT go up and down but they quickly return back to a zero-mean. It is a characteristic of a stationary DEPOSIT data.

(iii)   INVESTMENT

For INVESTMENT, the results of the Unit root tests for INVESTMENT is in table 5.1.4 as follows:

Table 5.1.4 Unit root test results (ADF) on INVESTMENT _(2nd difference in the variable and excludes Trend and Intercept)_

Null Hypothesis: D(LOG(INVESTMENT),2) has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 0 (Automatic - based on SIC, max lag=2)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-5.969967	0.0001
Test critical value	1% level		-2.847250	
	5% level		-1.988198	
	10% level		-1.600140	
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LOG(INVESTMENT),3)				
Sample (adjusted): 2008 2016				
Included observations: 9 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(INVESTMENT(-1))2)	-1.424786	0.238659	-5.969967	0.0003
R-squared	0.814833	Mean dependent variable		-0.259687
Adjusted R-squared	0.814833	S.D. dependent var		2.741195
S.E. of regression	1.179564	Akaike info criterion		3.272606
Sum squared resid	11.13097	Schwarz criterion		3.294520
Log likelihood	-13.72673	Hannan-Quinn criter		3.225316
Durbin-Watson stat	0.959070			

As the t-statistics 5.969967 (in absolute value) is higher than all the critical values 2.847250, 1.988198 and 1.600140 (in absolute terms) at 1%, 5% and 10% levels respectively, we can reject the null hypothesis that 2nd-difference INVESTMENT has a Unit root. In addition, the Prob. value is 0.0001 indicating there is 0.01% chance of making an error. Intuitively, the level and first-difference INVESTMENT data is non-stationary, but the second-difference INVESTMENT data is stationary.

In other words, for INVESTMENT, it can be concluded the data is non-stationary in the level and first-difference, but stationary in the second-difference.

Like for the DEPOSIT equation, for the INVESTMENT equation it was determined that the Constant and Trend are not significant, so the Constant and Trend terms are omitted from the regression for the INVESTMENT. And a line graph of a stationary second-difference INVESTMENT is as below in Figure 5.1.3

Figure 5.1.3 Line graph of a stationary second-difference INVESTMENT

INVESTMENT (Stationary)
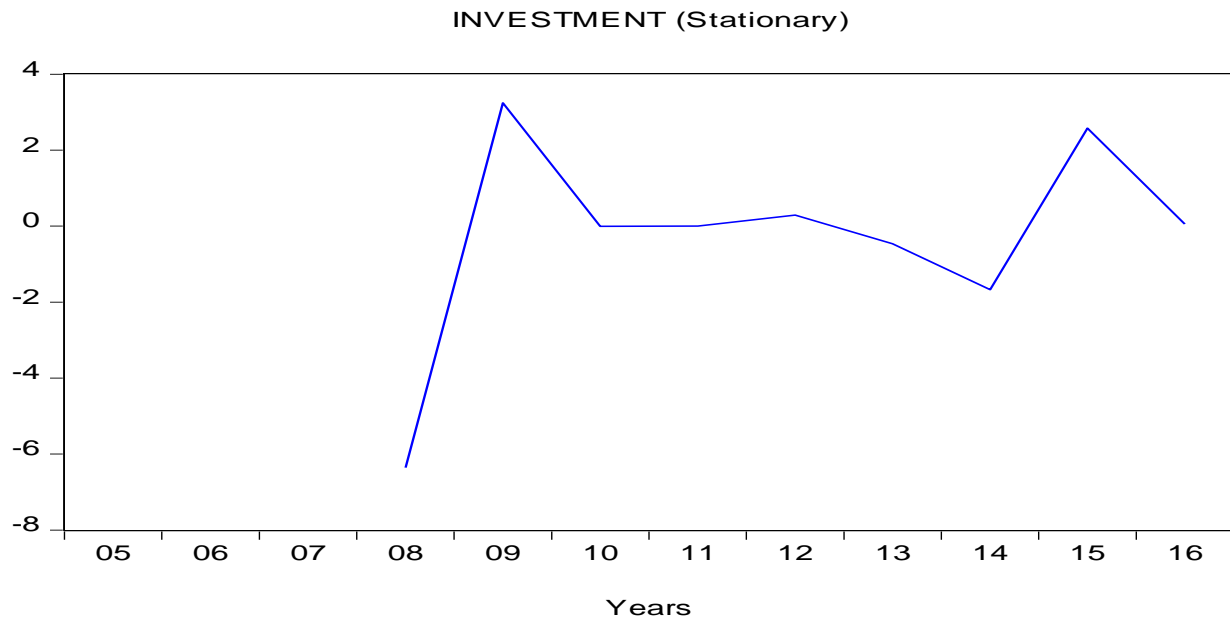
In the line graph above, the INVESTMENT's level variable in second-difference becomes stationary. The values of INVESTMENT go up and down but they quickly return back to a zero-mean. In addition, the results of the Unit root with Break Test and the corresponding line graph test statistics for INVESTMENT are in table 5.1.5 and figure 5.1.4 respectively as follow:

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Table 5.1.5 Unit root with Break Test for FINANCING

Unit Root with Break Test on D(LOG(INVESTMENT),2)			
Null Hypothesis: D(LOG(INVESTMENT),2) has a unit root			
Trend Specification: Intercept only			
Break specification: Intercept only			
Break Type: Innovative outlier*			
Break Date: 2013			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.452354	< 0.01
Test critical value	1% level	-4.734858	
	5% level	-4.193627	
	10% level	-3.863839	

Note: Innovative Outlier model assumes that the break occurs gradually as in this case of FINANCING. On the other hand, an Additive Outlier model assumes the break occurs immediately, and the tests considered evaluation the null hypothesis that the data follow a unit root process with a trend break.

Figure 5.1.4 Line graph of a Unit Root with Break Test for INVESTMENT

INVESTMENT (Unit Root with Break Test. A vertical line is located at an estimated trend break 2013)
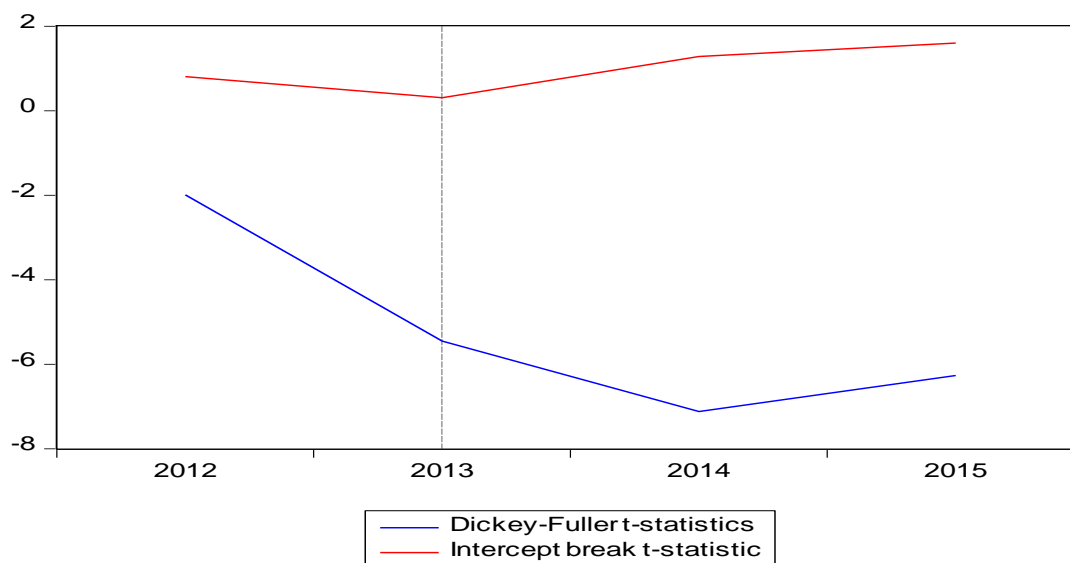
The line graph above shows a trend break in 2013. The trend break coincides when Islamic banks in Malaysia begun segregating investment accounts from deposit accounts in 2013 as per the requirement of the Islamic Financial Service Act 2013 (IFSA). Under the Act from 30 June 2015 deadline mudharabah-type of accounts were converted into investment accounts. The implication of the requirement is that investment account is risk-absorbing. Investment accounts are not guaranteed for principal and profit by Islamic banks, and Islamic banks are not required under the Act to hold regulatory capital against asset funded by accounts.

(b)   Co-integration test

The results of Co-integration test are as table 5.1.6 below.

Table 5.1.6 Co-integration test results

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None*	0.994323	72.03427	29.79707	0.0000
At most 1*	0.750977	20.32072	15.49471	0.0086
At most 2*	0.473688	6.418614	3.841466	0.0113
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None*	0.994323	51.71355	21.14162	0.0000
At most 1*	0.750977	14.90210	14.26460	0.0570
At most 2*	0.473688	6.418614	3.841466	0.0113
Max-eigenvalue test indicates 1 countegrating eqn(s) at the 0.05 level				

There are two tests where the first is the Trace test and the second is the Eigenvalue test. In the first test, the Trace test, since the Prob. for the first null hypothesis "None" ("there is no cointegrated equation; or all the variables FINANCING, DEPOSIT and INVESTMENT are not cointegrated") is 0.0000 is less than 0.005, we can reject the null hypothesis of no-cointegration. In other words, FINANCING, DEPOSIT and INVESTMENT are co-integrated or FINANCING, DEPOSIT and INVESTMENT have a long run association. This is further supported by the Trace statistic of 72.03427 that is higher than the 0.05 Critical value of 29.79707.

Similarly in the second test, the Eigenvalue, the null hypothesis "None" (there is no cointegrated equation) since the Prob. for the null hypothesis is 0.0000 which is less than 0.005 we can reject the null hypothesis that there is no cointegrated equation in the model. In the second null hypothesis "At most 1" (at most there is one cointegrated equation) since the Prob. for the null hypothesis is 0.0570 which is more than 0.005 we cannot the null hypothesis that at most there is one coinegrated equation the model.

6.0   Conclusion

This paper examines the empirical behavior of Islamic banks' financing, deposit and investment accounts. The paper uses yearly data from 2005 to 2016 of Islamic banks in Malaysia. The empirical analysis shows that financing, deposit and investment accounts exhibit co-integration over the long run. These findings have policy implications in terms of fulfilling risk-return preferences of a wider range of investment account holders and also in terms of operationalizing deposit and investment accounts by Islamic banks. In addition, for the banks, investment accounts provide new sources of funding available for use in productive activities through the broader application of Shariah contracts beyond debt-based

to include equity-based financing. Towards this end, the findings provide to the existing body of knowledge to propel Islamic finance to support real economic activity. It would certainly be more useful to extend the paper to a larger sample of banks from different countries. More so as Islamic banking is becoming a substantial part of the financial system in these countries like the Middle Eastern countries.

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Appendix 1: Fully Modified Ordinary Least Squares (FMOLS), Dependent variable: FINANCING, Independent variable: DEPOSIT, and Line graphs

Dependent variable	FINANCING			
Method	Fully Modified Ordinary Least Squares (FMOLS)			
Sample	2009 - 2016			
Included observation	8 after adjustments			
No cointegrating equation deterministics				
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth = 3.0000				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEPOSIT	-0.610120	0.186767	-3.266745	0.0137
R-squared	0.556573		Mean dependent var	-0.117046
Adjusted R-squared	0.556573		S.D. dependent var	0.309977
S.E. of regression	0.206414		Sum squared resid	0.298249
Long-run variance	0.034117			

Graphs of DEPOSIT and INVESTMENT

Years 2005 - 2016

LOG(DEPOSIT) —— LOG(FINANCING)

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