Are profit rates of the islamic investment deposit accounts independent of the interest rates of conventional banks ?

Zain, Syahirah and Masih, Mansur

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

18 December 2018

Are profit rates of the islamic investment deposit accounts independent of the interest rates of conventional banks ?

Syahirah Zain[1] and Mansur Masih[2]

Abstract: In theory, Islamic banking is different from conventional banking, since the former is supposedly based on a risk-sharing or profit-and-loss sharing paradigm, while the latter is based on interest rate and maximisation of wealth. However, many studies have claimed that in real practice, Islamic banking performance tends to imitate that of conventional banks. Through the standard time series techniques, this paper aims to study the impact of conventional fixed rates (CFR) and overnight policy rate (OPR) on the Islamic investment deposit profit rates (PR) of banks in Malaysia. This paper is also different from previous studies due to the inclusion of less tested variables such as, the ratio of Islamic deposits to total deposits (IDTD) as a proxy for the impact of market share on the determination of investment account rates, and the consumer price index (CPI) as a proxy of real economy on PR. Unexpectedly, it is found that PR is not strongly cointegrated with both CFR and OPR. It is still too soon to say that the prohibition of benchmarking and profit smoothing by Islamic Financial Services Act (IFSA) effective July 2015 might have had something to do with this. On the other hand, based on the VECM and VDC tests, PR is highly affected by the Islamic interbank rates. Based on this, policy makers could explore further on probable benchmarking between the banking sector and interbank money market within the Islamic financial segment.

Keywords*:* Islamic profit rates, interest rates, OPR, Islamic interbank rates, CPI, Malaysia

---

[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. Introduction

1.1 Motivation of the Paper

Islamic banks were built on the foundation of various Shariah contracts and interest-free to structure their financial products and services. The involvement of Islamic banks in interest-free banking supposedly leads to a positive contribution to financial stability. However, despite the claim of Islamic banks being interest-free, the issue with Islamic banking currently is that most of its products seem to be imitations of conventional finance products. For example, the profit rates of its investment accounts are claimed to be based on the interest rates of conventional deposit accounts, and therefore are deemed similar to each other. However, the foundations of a true Islamic finance are different from conventional. While conventional finance is both profit driven and interest-based, Islamic finance focuses on an equitable distribution of profits and losses.

The "Kuala Lumpur Declaration" statement in 2012 argued that risk sharing is the essence of Islamic finance. For this very reason, some of its recommendations were for governments to enhance risk-sharing systems by levelling the playing field between equity and debt and design fiscal and monetary policies based on risk sharing (Ng et al., 2015). According to Kassim et al (2009), the primary reason that Islamic banking may become more stable compared to conventional banks is that they are not affected by the fluctuations of interest rates. On top of that, Zuberi (1992) went as far as likening Islamic banks' profit and loss sharing (PLS) to the capital venture due to sharing the risk and profit. Because they are able to reflect the losses to their customers, Islamic banks are less likely to go bankrupt in times of crisis compared to the conventional banks.

In 2013, Islamic Financial Services Act (IFSA) was introduced by Bank Negara Malaysia (BNM). Its objectives include customer protection and financial stability, and therefore prohibits profit smoothing by banks. On top of that, in regards to Shariah-compliance of Islamic banks, IFSA requires Islamic banks to reclassify their deposits into principal-guaranteed Wadiah or Qard accounts with no returns paid, restricted and unrestricted investment accounts based on Wakalah (agency), Mudarabah (partnership of capital and labour) or Musharakah (joint-venture). The objective is to encourage and push the industry back to its initial foundations of Islamic finance by enforcing the practice of more genuine PLS contracts. Its success will hopefully have positive implications for many other regulators around the world,

who are either waiting to take advantage of the fast growth in Islamic finance or those, which like BNM, who are merely trying to improve the industry towards a meaningful version of Islamic finance.

In order for an Islamic bank to be sustainable in the long run, its business model must be able to continuously fulfil various demands and expectations of its stakeholders without compromising its Shariah value propositions. Funds are essential for all types of business entities including Islamic banks. They are directly related to the amount of investments and financing facilities an Islamic bank could undertake and thus influencing the level of its profitability and performance. Through PLS contracts, the investment account holders (IAHs) are expected to bear the risk of investment and because of that, warrant their entitlement to the profits made from the investments, thus making them shariah-complaint. Afterall, in theory, profit rates should be independent from the effects of any pre-determined interest rate schemes.

Being one of the world's leading players of Islamic finance, we believe it is not an easy task for the Malaysian Islamic banks to disassociate themselves completely from the effects of interest rate movements or the policy intervention especially by their regulator, BNM, who also governs the country's money policy and conventional banking system. There must be some level of interventions by BNM to preserve an orderly financial system, as Islamic finance is increasingly becoming a significant segment of the country's financial system.

This paper will be divided into 5 main sections. After the objectives in the next sub-section, section 2.0 will the review of past literatures which investigated the determinants of Islamic investment account rates as well as the theoretical underpinnings. The data and methodology will be discussed in Section 3 while the empirical results and discussions are dealt with in Section 4. Finally, this article ends with the major conclusions and policy implications of the study in Section 5.

1.2 Objectives of the Study

It is the aim of this paper to study the impact of BNM's monetary policies especially the conventional fixed rates (CFR) and overnight policy rate (OPR), on the Islamic investment deposit profit rates (PR). The cointegration technique will be used to test whether conventional interest rates are cointegrated with the PR. Ideally, CFR and OPR should have no significant influence on the PR, given the fact that they are supposedly interest free. Additionally, this research leverages on Variance Decomposition (VDC) to rank the exogeneity of the factors

that affect Islamic banks' profit rates. As a matter of further enhancement of the study, the paper included less tested variables such as the ratio of Islamic deposits to total deposits (IDTD) as proxy for the impact of market share on the determination of investment account rates, and the consumer price index (CPI) to check the significance of real economy on PR. The relationship between interest rates and inflation is one of the most studied topics in economics where inflation is the first differenced form of CPI. However, this paper is more interested to test the CPI which is the proxy to the price of the goods and services. This is because we believe the Islamic investment deposits are used to finance real sector activities. This paper would explore whether CPI can be a more significant influencing factor behind the performance of the Islamic investment deposits, in line with the theoretical foundations.

2.0 Literature Review

Several studies relating to the relationship between the conventional interest rates and Islamic investment deposit rates in Malaysia were found. Quite apparently, the researchers had a similar motive as ours although the methods employed by them and the data range investigated were not the same. Their findings, too, were different between one another.

One of the earliest studies that provides the theoretical explanation of the impact of interest rate changes on Islamic banks is that by Rosly (1999). The study highlights how the over-dependency on fixed-rate financing has meant that Islamic banks have always been sensitive to interest rate changes on the liabilities side of their balance sheets. If interest rates rise, there is a possibility of a shift of deposits from Islamic banks with non-fixed rate returns to conventional banks with higher returns. Although this may not be the case for all Muslims, many of the non-Muslim clients of Islamic banks may react this way to changes in interest rates. Hakan and Gulumser (2011) concluded that although the religious factor is a crucial element for Muslims to refrain from any form of interest in their financial dealings by prioritising Islamic banking products over conventional ones, the public at large is still likely to expect Islamic banks to perform either equally or better than conventional banks in terms of risk and return value, in order for them to continue using Islamic banking products. This, in return, causes a displaced commercial risk as well as negative funds gap, while also affecting the profitability of Islamic banks in general.

On top of that, Chong and Liu (2009) found a relationship between Islamic deposit and investment account rates with conventional deposit rates. Contrary to popular belief, Islamic

investment rates were significantly lower and less volatile than conventional deposit rates. Additionally, they found that only a small portion of Islamic bank financing is strictly based on PLS and that Islamic deposits are not exactly interest-free, but rather are closely related to conventional deposits. They used monthly data on Islamic investment rates and conventional deposit rates from BNM's Monthly Statistical Bulletin between April 1995 and April 2004.

A related study done by Farook, Hassan and Clinch (2012) found that customers' religiosity, the market's financial development, the banks' asset composition and the existence of discretionary reserves are the factors for most Islamic banks manage their profit distributions towards market-based interest rates and away from asset returns.. On the other hand, the proportion is negatively related to the market's familiarity with Islamic banking, market concentration, reliance on depositor funding and how long the Islamic bank has been in operation. Data spanning from 1993 to 2005 from 50 Islamic banks were used. They used the multiple Ordinary Least Square (OLS) regression to determine the factors that affect banks' profit distribution management. The authors also ran a descriptive analysis involving four variables; asset spread, deposit spread, equity spread and a combined spread (asset spread and the inverse of the deposit spread) was done to establish the manifestation of banks managing their profit distributions.

Abedifar et. al (2016) note that Islamic banks are more inclined to invest in the real economy while concurrently being more risk-averse. They also found that medium sized Islamic banks tend to help advance credit provision and are negatively linked to income inequality. This was the case for predominantly Muslim countries with dual-banking economies, that Islamic banks tend to mirror the performance of conventional banks, especially in helping to increase access to finance and financial deepening. The study was done on both Islamic and conventional banks between the years 1999 and 2011.

Besides that, a study done by Cevik and Charap (2011) from the International Monetary Fund (IMF) examined the behaviour of conventional bank deposit rates and the rates of return on retail Islamic PLS investment accounts in Malaysia and Turkey. They used monthly data from January 1997 to August 2010 and four econometric tools namely the cointegration test, bivariate test, vector error correction model (VECM) and an investigation of the correlation of volatility between them. They found the conventional interest rates to affect Islamic investment accounts and a long-run cointegration between the PLS returns and the conventional bank deposit rates.

Majority of the above researches have commonly focused on a one-to-one comparison between corresponding conventional and Islamic deposit rates in the banking sector while in studies like Gulzar and Masih (2015) have included some other variables such like overnight policy rates (OPR), Islamic money market rates, ratios of Islamic deposits to total assets and to total deposits. The paper attempted to test whether conventional rates is still cointegrated with Islamic banks' profit rates in Malaysia and a ranking of the exogeneity of the factors that affect the profit rates. It uses a range of multivariate time series techniques namely the cointegration test, VECM, cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests, variance decomposition (VDC), impulse response and persistence profiles. The paper found that Islamic profit rates are cointegrated with the conventional rates such as OPR and conventional fixed rates. Additionally, it is also led by Islamic banks' dependency on deposits for funding and their market shares.

This research is an extension of the paper with a bit of a tweak. We had removed one of its variables which is the ratio of Islamic deposits to total assets as a proxy of Islamic banks' dependency on deposits for funding. We have instead, included CPI which we believed to have some influences on the Islamic investment deposit rates. Ideally the performance of Islamic investment deposits should not be correlated with any other pool of deposits or interest rates as the results should be directly associated with their underlying assets.

3.0 Data and Methodology

This paper uses the following variables:

1. 6-month Islamic investment account profit rates (PR)
2. 6-month conventional fixed deposit rates (CFR)
3. Overnight policy rates (OPR)
4. Islamic Interbank rates (IIR)
5. Ratio of Islamic deposits to total deposits (IDTD) as a proxy for the impact of market share on the determination of investment account rates
6. Consumer Price Index (CPI) as the proxy to the goods and services price, being a key indicator of economic performance

The first five variables were obtained through the BNM's Monthly Statistical Bulletin while CPI was taken from the Data stream. The data are monthly for nine years starting from January 2007 with a total of 108 observations.

This study tests the relationship between Islamic and conventional rates, specifically whether the latter are still cointegrated with Islamic investment account profit rates. Besides the 6-month profit rates and the conventional fixed deposit rates, it uses the ratio of Islamic deposits to total deposits as a proxy for market share. Additionally, the OPR and Islamic interbank rates are studied since they are the benchmarks for conventional and Islamic rates respectively. On top of that, CPI was also introduced the proxy to the goods and services price, being a key indicator of economic performance we would be able to verify the real sector impact on the Islamic investment account profit rates, if any.

The relationships between the six variables are analysed using various econometric tools namely the unit root tests (Augmented Dickey-Fuller and Phillip Perron); Vector Autoregressive (VAR) test; cointegration tests (Engle-Granger and Johansen); the Long-run Structural Model (LRSM); Vector Error Correction Model (VECM) to test the absolute exogeneity of the variables; VDC ranking of the leading variables or the most independent; a test of their inter-temporal linkages through the impulse response function (IRF) and lastly, an investigation of the impact of a system-wide shock on the variables through the persistence profiling (PP) function. Both IRF and PP functions provide further information regarding the sign and timing of the variables' adjustments to shocks.

4.0 Empirical Results and Interpretation

4.1 Unit Root Test

	VARIABLE	ADF	VALUE	T-STAT.	C.V.	RESULT
ADF: LOG FORM	LCFR	ADF(2)=AIC	203.1226	-2.424	-3.454	Non-Stationary
		ADF(1)=SBC	197.5809	-2.184	-3.454	Non-Stationary
	LCPI	ADF(1)=AIC	409.7511	-3.989	-3.454	Stationary
		ADF(1)=SBC	404.5011	-3.989	-3.454	Stationary
	LIDTD	ADF(1)=AIC	279.2158	-2.103	-3.454	Non-Stationary
		ADF(1)=SBC	273.9658	-2.103	-3.454	Non-Stationary
	LIIR	ADF(1)=AIC	205.5819	-2.363	-3.454	Non-Stationary
		ADF(1)=SBC	200.3320	-2.363	-3.454	Non-Stationary
	LOPR	ADF(2)=AIC	154.4478	-2.248	-3.454	Non-Stationary
		ADF(2)=SBC	147.8853	-2.248	-3.454	Non-Stationary
	LPR	ADF(5)=AIC	192.3249	-2.748	-3.454	Non-Stationary
		ADF(1)=SBC	183.7810	-1.850	-3.454	Non-Stationary

Table 1: ADF Level and Log Form

	VARIABLE	ADF	VALUE	T-STAT.	C.V.	RESULT
1ST DIFF. FORM	DCFR	ADF(1)=AIC	199.4300	- 4.853	- 2.890	Stationary
		ADF(1)=SBC	195.5073	- 4.853	- 2.890	Stationary
	DCPI	ADF(4)=AIC	401.2030	- 5.608	- 2.890	Stationary
		ADF(1)=SBC	396.8286	- 6.496	- 2.890	Stationary
	DIDTD	ADF(1)=AIC	272.9786	- 7.321	- 2.890	Stationary
		ADF(1)=SBC	269.0559	- 7.321	- 2.890	Stationary
	DIIR	ADF(1)=AIC	201.0576	- 4.898	- 2.890	Stationary
		ADF(1)=SBC	197.1349	- 4.898	- 2.890	Stationary
	DOPR	ADF(1)=AIC	151.5055	- 5.705	- 2.890	Stationary
		ADF(1)=SBC	147.5828	- 5.705	- 2.890	Stationary
	DPR	ADF(4)=AIC	187.4621	- 3.215	- 2.890	Stationary
		ADF(1)=SBC	181.4811	- 6.810	- 2.890	Stationary

Table 2: ADF at Level and Log Form

Cointegration requires the variables to be I(1), which means that they are non-stationary in their level forms and stationary in the differenced forms. In order to ascertain the stationarity status, two unit root tests were run, namely the Augmented Dickey-Fuller (ADF) and Phillips-Peron (PP). The ADF, as per Table 1, suggests that all variables are I(1) except for one variable (CPI) which is stationary at level form. On the other hand, the PP results in Table 2 below, confirm that all variables are I(1). Therefore, we took comfort at the PP test results to proceed as the test solves both the issues of autocorrelation and heteroscedasticity, while ADF only solves the first problem.

	VARIABLE	T-STAT	C.V.	RESULT
PP: LOG FORM	LCFR	-1.867	-3.456	Non-Stationary
	LCPI	-1.973	-3.456	Non-Stationary
	LIDTD	-1.874	-3.456	Non-Stationary
	LIIR	-1.742	-3.456	Non-Stationary
	LOPR	-1.872	-3.456	Non-Stationary
	LPR	-1.936	-3.456	Non-Stationary

	VARIABLE	T-STAT.	C.V.	RESULT
PP: 1ST DIFF. FORM	LCFR	-6.725	-2.781	Stationary
	LCPI	-5.782	-2.781	Stationary
	LIDTD	-9.763	-2.781	Stationary
	LIIR	-5.123	-2.781	Stationary
	LOPR	-10.260	-2.781	Stationary
	LPR	-11.581	-2.781	Stationary

Table 3: PP at Level and Log Form

4.2 Order of the VAR

Table 4 below provides the second requirement for the cointegration test, which is the number of lag order based on three different tests. Based on both the Akaike Information Criterion (AIC) and Adjusted LR tests, the order of the VAR model is found to be four, while the Schwarz Bayesian Criterion (SBC) gives one the number of lag order. AIC tends to indicate the higher number of lags at the expense of the degrees of freedom. It is also less concerned with the problem of over parameterization. SBC on the other hand, tends to give the lower number of lags with a possible problem of autocorrelation of the error correction term. In this case, we chose the lag order of four (4).

Order	AIC	P-value	C.V.
4	1660.4	[0.000]	5%
Order	**SBC**	**P-value**	**C.V.**
1	1521.0	[0.000]	5%
Order	**Adj. LR**	**P-value**	**C.V.**
4	86.283	[0.120]	5%

Table 4: Order of VAR Model

4.3 Cointegration

We then proceed with the cointegration tests, having determined the variables' I (1) status and a lag order of four. The main objective of this research is to explore on the existence of cointegration between the profit rates (PR) of Islamic investment deposit accounts and the other five variables that were selected. Existence of cointegration implies that the relationship among these variables is not spurious and they tend to move together in the long run and therefore they are theoretically related.

ADF	VALUE	T-STAT.	C.V.	RESULT
ADF(6)	194.8068	-2.8953	-4.875	No cointegration
ADF(1)	190.1249	-3.4121	-4.875	No cointegration

Table 5: Engle Granger

Firstly, we performed Engle-Granger (E&G) test. The test gave negative results suggesting the variables are not cointegrated at 5% significance level. From the table, we can see that the absolute values of t-statistics for both highest AIC and SBC are both lesser than the critical

value of 4.875. This means that the null hypothesis of non-stationarity of the error correction term cannot be rejected. This indicates no cointegration among the variables.

Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix

Null	Alternative	Statistic	95% Critical Value	90% Critical Value	Result
r = 0	r = 1	96.269	43.610	40.760	
r<= 1	r = 2	36.297	37.860	35.040	*1 cointegration*

Cointegration LR Test Based on Trace of the Stochastic Matrix

Null	Alternative	Statistic	95% Critical Value	90% Critical Value	Result
r = 0	r>= 1	188.353	115.850	110.600	
r<= 1	r>= 2	92.084	87.170	82.880	*2 cointegration*
r<= 2	r>= 3	55.7865	63.000	59.160	

Table 6: Johansen Test

We then proceed with the second test, which is the Johansen cointegration test. The results above show strong evidence that there is a theoretical, long-term relationship among the six variables and that each variable contains information for the prediction of other variables. The Maximal Eigenvalue table shows a cointegration of one, while the Trace statistics suggests a cointegration vector of two at 5% significance level. In this case, the Johansen test results are preferred as the test creates a stationary error term by assigning hypothetical values to the coefficients of the variables and therefore does not have a restrictive assumption. E&G on the other hand, tests for cointegration by checking whether the error term is stationary through unit root tests such as ADF. A stationary error term suggests the existence of cointegration as the variables are adjusting to each other to bring about long-term equilibrium. For the purpose of this study, we proceed to the next step with 1 cointegration.

4.4 Long-run Structural Modelling (LRSM)

Next, a long-run structural modeling (LRSM) test was conducted to estimate a theoretically meaningful long- run relationship between the variables by imposing some restrictions on the relationships and then testing them. We used exact identification to normalise the coefficient of our variable of interest, PR by equating it to one. The test results suggest that somehow all variables are not significant. Based on theory, we are unable to comprehend this yet. It was puzzling to note that neither the conventional fixed rates (CFR) nor the OPR were of any significance over PR.

VRBL	PANEL A	PANEL B	PANEL C	PANEL D
LCFR	2.6646	0.00	0.00	0.69868
	(2.5595)	(NONE)	(NONE)	(0.44578)
LCPI	-14.0275	-10.7337	-14.0025	-3.6781
	(8.8210)	(4.7533)*	(7.0320)*	(1.3466)*
LIDTD	-2.1787	-1.0062	0.00	-0.57127
	(1.5386)	(0.54625)*	(NONE)	(0.26258)*
LIIR	3.8138	2.6502	2.9313	1.0000
	(2.4292)	(1.2382)*	(1.6104)*	(NONE)
LOPR	-7.7317	-3.8803	-4.0687	-2.0273
	(4.9381)	(1.4179)*	(1.8079)*	(0.45835)*
LPR	1.0000	1.0000	1.0000	0.26221
	(NONE)	(NONE)	(NONE)	(0.16701)
Trend	0.042577	0.028910	0.028983	0.011164
	(0.026031)	(0.011705)	(0.014383)	(0.003717)
CHSQ(1)	NONE	3.2419[.072]	7.5567[.023]	NONE

s.e. in parentheses

Table 7: LRSM

Table 7 shows that during the exact-identification stage (Panel A), none of the test variables were significant. When we proceeded with the over-identification where we restricted conventional fixed deposit rates (CFR) coefficient to zero, the t-statistics which is derived by dividing the coefficients with the standard errors, suggests that the restriction is correct and all the variables are significant. The removal of the conventional fixed deposit rates in the test may have fast tracked the relationship between OPR and Islamic investment account rates. Moving further, we tried to restrict IDTD as well and the results show that all variables are significant too. We also purposedly tried to test if the variables are significant if an exact identification was done with Islamic Interbank Rates (IIR) as the focus variable (Panel D). This is likely because all banking rates are ultimately benchmarked against the interbank rate, which in this case is OPR.

4.5 Vector Error Correction Model

Cointegration cannot tell us the direction of Granger causality ie which variable is leading and which is lagging (or which variable is exogenous and which is endogenous). To discern the endogeneity and exogeneity of the variables, the Vector Error Correction Model (VECM) technique is applied. VECM also allows an exploration of the short and long-run dynamics among the variables since they are found earlier to be cointegrated.

ecm1(-1)	Coefficient	Standard Error	T-Ratio [Prob.]	C.V.	Result
dLCFR	0.1543	0.026547	5.8124 [.000]	5%	Endogenous
dLCPI	0.0068	0.008169	0.83452 [.406]	5%	Exogenous
dLIDTD	- 0.0138	0.028175	- 0.48881 [.626]	5%	Exogenous
dLIIR	0.0573	0.037845	1.5137 [.134]	5%	Exogenous
dLOPR	0.4138	0.054829	7.5464 [.000]	5%	Endogenous
dLPR	0.1053	0.049738	2.1169 [.037]	5%	Endogenous

Table 8: VECM

Based on the p-values of the error correction terms, the VECM results came as a surprise to us. Three of the variables are exogenous namely the CPI, the ratio of Islamic deposits to total deposits (IDTD) and Islamic Interbank Rates (IIR). This means that CPI, IDTD and IIR are the leading variables that absorb the exogenous shocks first before transmitting them to other variables. This implies the IAHs should closely monitor these three indicators before deciding to invest in GIA products. Additionally, the results tell us that the IDTD ratio, which is a proxy for the banks' reliance on depositor funding possibly because the extent of a bank's dependence on depositor funding is affected by other variables such as the amount of shareholder funds it has, its business model and the country's regulations on deposits.

However, unlike CPI and IDTD, our intuition tells that IIR's exogeneity especially over OPR is unexpected. Being the target interest rate aimed at driving the monetary policies, OPR in actual fact is a controlled rate, and thus more likely expected to be exogenous, instead. Further, compared to the conventional interest rates which represent a relatively larger pool of funds in both the banking sector and interbank money market, it is very unlikely for the Islamic interbank money market to override these two. This requires us to further validate the results.

The remaining variables are found to be endogenous namely the Islamic investment account profit rates (PR), conventional fixed rates (CFR) and OPR. Endogeneity indicates that these

variables depend on the deviations of exogenous variables. We need to stress here that the results were obviously unexpected.

4.6 Variance Decompositions

We move on to generalised variance decomposition (VDC) technique to quantify the degree of exogeneity or endogeneity of each variable. Unlike the VECM procedure which predicts the relationship based on the pass records, generalised VDC decomposes the variance of forecast error of each variable including its own into proportion attributable to the shocks from each variable in the system. The variable that is explained mostly by its own shocks (and not by others) is deemed to be the most exogenous.

Horizon	Variable	LCFR	LCPI	LIDTD	LIIR	LOPR	LPR
60 months	LCFR	0.49%	16.82%	18.37%	63.02%	2.75%	0.92%
	LCPI	0.37%	87.02%	3.78%	6.96%	3.28%	5.30%
	LIDTD	4.14%	0.89%	82.30%	8.74%	3.63%	1.84%
	LIIR	0.72%	11.85%	13.59%	73.84%	2.52%	0.41%
	LOPR	0.85%	19.51%	20.51%	59.43%	4.11%	1.40%
	LPR	1.70%	7.43%	15.70%	53.47%	11.73%	17.90%
	Exogeneity	0.49%	87.02%	82.30%	73.84%	4.11%	17.90%
	Ranking	6	1	2	3	5	4

Table 9: Generalised VDC

The generalised VDC technique is preferred over the orthogonalised because the former has no bias towards the order of the variables in the equation, particularly the first variable, and it has a more realistic assumption of investigating the impact of a shock from one variable, assuming the other variables can change. Orthogonalised VDC assumes the other variables are switched off when one variable is shocked. Thus, the generalised technique is more useful when the results are normalised as a percentage of the total. It should be noted that while the VECM results is based on the sample and therefore historical data, VDC results project looks into the future.

The VDC results here indicate that the Islamic investment accounts profit rates (PR) are mostly influenced by IIR at 53% and surprisingly, not influenced by the conventional fixed rates at 2%. This means that we may want to explore on probable benchmarking between the banking sector and interbank money market within the Islamic financial segment. This test also confirms the exogeneity of CPI, however it also has the least significance on the PR at 7%. In

conclusion, we can say that the results indicate that the PR rates are highly correlated to the Islamic Interbank Rate movements in the market and not the real sector indicator like CPI.

The ratio for market share (proportion of Islamic deposits to total deposits) remain exogenous in future as the factors that affect it may not only be the variables in this study like the interbank and product rates. Given the implementation of IFSA, where Islamic banks can no longer use the profit equalisation reserve and investment risk reserve to smooth returns on investment accounts, the proportion of Islamic deposits to total deposits may depend on other factors. According to Gulzar and Masih (2015), these include customer awareness of the Shariah merits and profit and loss potential of the investment accounts, willingness of other Islamic banks to partake in the investment account initiative and other encouraging regulations enforced by BNM to spur the growth of Islamic finance in Malaysia. These could perhaps be the key variables affecting the ratio for market share in future, making it exogenous.

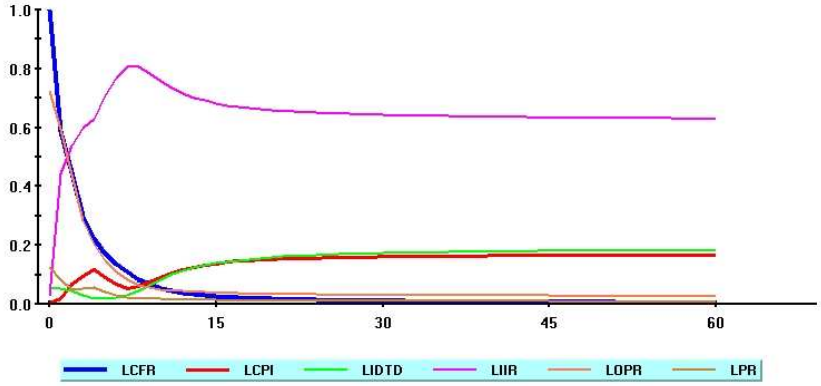
4.7 Impulse Response Functions

We then applied generalised impulse response functions (IRF) on the data and the output results are presented in Figure 1. IRFs essentially produce the same information as the VDCs, except that they can be presented in graphical form.

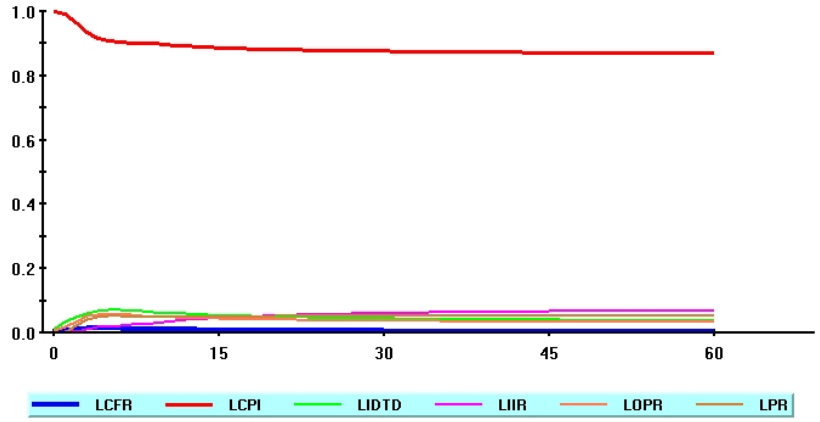
4.8 Persistence Profile

Meanwhile the persistence profile in Figure 2 illustrates the situation when the entire cointegrating equation is shocked, and indicates the time it would take for the relationship to get back to equilibrium. Here the effect of a system-wide shock on the long-run relations is the focus (instead of variable-specific shocks as in the case of IRFs). The chart below shows the persistence profile for the cointegrating equation of this study, where it indicates 14 months as the time to be taken by the cointegrating equation to reach equilibrium.

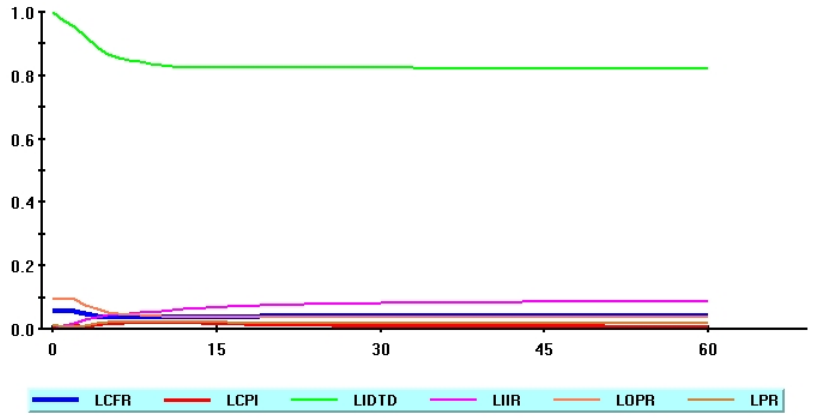
Generalized Forecast Error Variance Decomposition for variable LCFR



Generalized Forecast Error Variance Decomposition for variable LCPI



Generalized Forecast Error Variance Decomposition for variable LIDTD



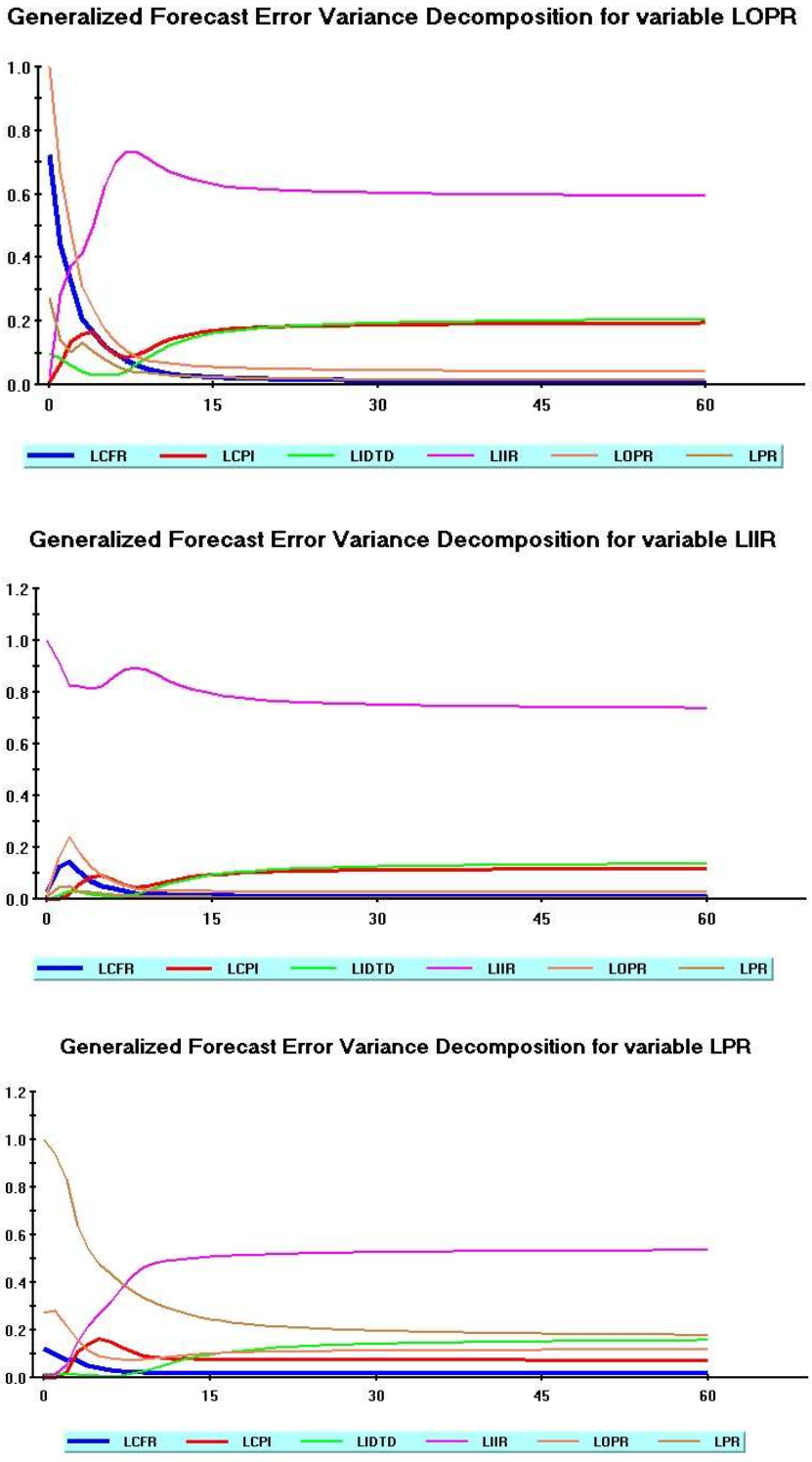

Generalized Forecast Error Variance Decomposition for variable LOPR
1.0
0.8
0.6
0.4
0.2
0.0
0
15
30
45
60
LCFR
LCPI
LIDTD
LIIR
LOPR
LPR
Generalized Forecast Error Variance Decomposition for variable LIIR
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
15
30
45
60
LCFR
LCPI
LIDTD
LIIR
LOPR
LPR
Generalized Forecast Error Variance Decomposition for variable LPR
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
15
30
45
60
LCFR
LCPI
LIDTD
LIIR
LOPR
LPR

Figure 1: IRF

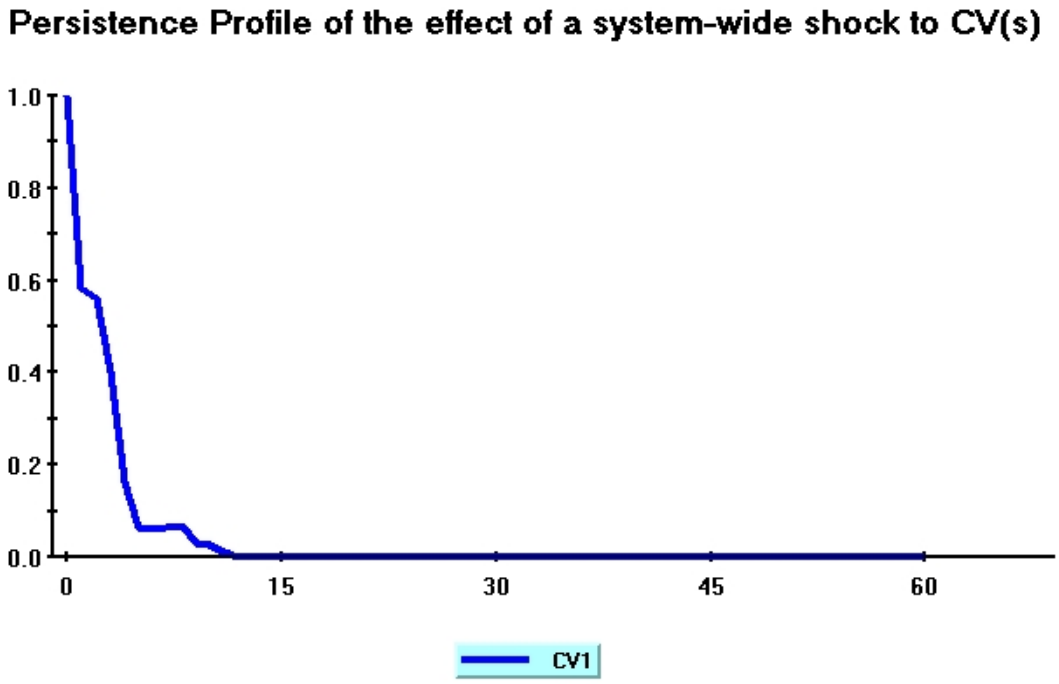


Figure 2: Persistence Profile

5.0 Conclusion and Policy Implications

This paper provides the latest information on the relationship between Islamic rates such as investment account and interbank rates, with the conventional bank rates in Malaysia. This study contributes to the literature through its use of the latest data (up to December 2015) and its rank of less-tested variables such as the ratio of Islamic deposits to total deposits (IDTD) as proxy for the impact of market share on the determination of investment account rates, and the consumer price index (CPI) to check the significance of real economy on PR.

Contrary to previous literatures, the profit rates of Islamic investment accounts were found to be not heavily cointegrated with the major interest rate regimes. Though endogenous, the variable PR was found to be mostly influenced by the Islamic interbank rates (IIR) at 53% compared to the expected conventional fixed rates (CFR) or OPR. This could be due to the IFSA prohibition of benchmarking and profit smoothing prior to finalising the final profit rates to be declared, which was effective 1 July 2015. This also means that policy makers could explore on probable benchmarking between the banking sector and interbank money market within the Islamic financial segment, and not the real sector indicator like CPI.

The price of goods and services which was represented through by CPI, has very little impact on the performance of Islamic investment accounts compared to the IIR. PLS structures are commonly thought to be linked to real sector activities but this result seems to contradict such views, as PR depends poorly on it at only 2%.

Having said that, this study comes with its set of limitations. The first limitation is that the results are only based on data from Malaysia. Therefore it does not represent other jurisdictions, regulators and Islamic banks of other countries who would still need to draw lessons from the paper and personalise it to their local practices. The multivariate time series technique also has limitations. For example, the cointegrating tests (such as Johansen) and the unit root tests are biased in favour of accepting the null hypothesis. The cointegration tests also require variables to be I(1) but the order of integration of a variable, whether I(1) or I(0), may depend on the number of lags included or whether the intercept and/or the trend are included or excluded in the unit root tests. Perhaps other econometrics could be used in further studies to achieve a more robust and accurate results. Finally, we hope that our limited analysis can be further improved upon by those with higher knowledge and expertise. We hold ourselves responsible for all the assumptions made for the purpose of this paper and all the limitations of our research.

References

Abedifar, P., Hasan, I. and Tarazai, A. (2016). Finance-growth nexus and dual-banking systems: Relative importance of Islamic banks, *Journal of economic Behavior and Organization*, 72, 864 -883.

Cevik, S., and Charap, J. (2011). Behavior of Conventional and Islamic Bank Deposit Returns in Malaysia and Turkey. *International Monetary Fund, Working paper,* Number 11/156.

Chong, B. S., and Liu, M. H. (2009). Islamic banking: interest-free or interest-based? *Pacific-Basin Finance Journal*, 17(1), 125-144.

Farook, S., Hassan, M. K., and Clinch, G. (2012). Profit distribution management by Islamic banks: An empirical investigation. *Quarterly Review of Economics and Finance,* 52(3), 333-347.

Gulzar, R., and Masih, M. (2015). *Islamic banking: 40 years later, still interest-based? Evidence from Malaysia,* MPRA paper, Number 65840

Hakan, Etem E. and Gulumser, Bengul, A. (2011). *Impact of Interest Rates on Islamic and Conventional Banks: The Case of Turkey*, MPRA paper, Number 29848.

Kassim, S., Majid, M. A. and Yusof, R. M. (2009) Impact of monetary policy shocks on conventional and Islamic banks in a dual banking system: evidence from Malaysia, *Journal of Economic Cooperation and Development,* 30 (1), 41-58.

Ng, A., Mirakhor, A. and Ibrahim, M. H. (2015). *Social capital and risk sharing: an Islamic finance paradigm*, New York, Palgrave Macmillan

Rosly, Saiful Azhar (1999). Al-Bay' Bithaman Ajil financing: Impacts on Islamic banking performance. *Thunderbird International Business Review*. 41(4-5); 461-480.

Zuberi, H. A. (1992) Interest free banking and economic stability, *Pakistan Development Review,* 31(4), 1077-1087.