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12 February 2017

Online at <https://mpra.ub.uni-muenchen.de/98677/>

MPRA Paper No. 98677, posted 18 Feb 2020 21:22 UTC

Lead-lag relationship between GIA deposit and GIA profit rate in Islamic banks:

evidence from Malaysia

Ruslinda Sulaiman¹ and Mansur Masih²

Abstract

What actually determines the level of savings in the banking system? According to the classical and neo-classical economists, interest rate has long been recognized as one of the factors that determine savings in the economy. This notion has been supported by the contemporary economists who are of the opinion that interest rate leads the level of savings. However, the situation is quite different in the Islamic banking environment as there is no predetermined rate of return hence it is unknown whether Islamic banks are indeed subjected to this conventional theory of savings.

As such, this paper attempts to fill in the gap of the existing studies which mostly support the conventional theories that the rate of return determines the level of deposits even in the Islamic banks. The methodology employed uses the standard time series techniques.

Our results tend to suggest that in the Granger-causality (i.e., in the lead-lag) sense, the endogenous variable is the GIA profit rate, while the level of deposits (or savings), FD Rate and GDP are the exogenous variables. The Granger-causal chain implied by our evidence tends to suggest that GIA deposits predominantly lead the GIA profit rate. This is consistent with the mudarabah contract whereby how much profit each depositor earns depends on the final outcome of the bank's own investment strategies on the deposited amount. From the LRSM test, the result shows that the GIA profit rate has positive relationship with the GIA deposit and GDP; while negative relationship with the real interest rate on conventional deposit (FD Rate).

The findings of this study have two main important implications - on the risk management practices - as banks will be facing with displaced commercial risks which will trigger a need for a higher PER and IRR to accommodate expected return of depositors. And - a good asset-liability management practice - where while maintaining competitiveness, the banks are not to forgo efficiency and profitability.

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1. INTRODUCTION

The financial services sector is the bedrock of any economy. It is a key enabler of the overall economy, providing capital (in various forms) to enable the growth of all other industries in the economy. In Malaysia, banking institutions play pivotal roles in ensuring a continuous supply of funds to the economy by offering bank loans or financing to business organizations as a source of capital. Thus the ability of banks in providing loans or financing depends very much on their ability of attracting mainly deposits as a source of funds. Funds deposited in the banking system can be categorized into mainly three different accounts – current, savings and fixed deposits in conventional and and general investment account (GIA) in Islamic banks.

This paper will focus on the general investment account (GIA) as a proxy of Islamic savings placed by individuals in the Malaysian Islamic banks. They agree to place deposits for a fixed period of time or term, and be governed by Mudarabah contract with the bank. These deposits will represent their savings to meet three main motives – transactions, precautionary and investment. (Keynes,1936). From the economic perspective, saving is important because of its direct link to economic growth and prosperity of a country. The importance of savings has been long recognized in the history of mankind from both religious and economic perspectives. In Islam the emphasis of savings is reiterated in the Surah Yusuf, *You shall sow for seven years continuously, then what you reap leave it in its year except a little of which you eat. Then there shall come after that seven years of hardship which shall eat away all that you have beforehand laid up in store for them, except a little of what you shall have preserved. Then there will come after that a year in which people shall have rain and in which they shall press (grapes).* (Qur'an, 12 : 47-49)

According to conventional economics, saving is the excess of income over consumption expenditure (Keynes, 1936). Saving is intended to meet future consumption as well as to provide means for investment. As people save and forgo their current consumption, the 'sacrifice' must be rewarded by positive - additional amount to their saving. The positive time value of money implies that the desire to get the additional amount, or simply profit seeking motive, is recognized as the main reason for saving in the conventional banking institutions. Interest rate has long been recognized not only by classical and neo-classical economists but also by contemporary economists as one of the factors that determine the level of savings in the economy. Although there are cases of inconsistent findings, it is a generally accepted opinion that interest rate has a positive relationship with savings.

Islam is, however, against any practices that provide excess in return of which no reward or equivalent counter-value is paid, better known as *riba*. The strict prohibition of *riba* in Islam is a result of its deep concern for the moral, social, and economic welfare of mankind; hence Islam encourages various trading and equity-based investment activities through the contract of *murabahah* and *mudarabah/musharakah*. This contracts offer returns in terms of pure profit and profit and loss sharing.

GIA deposits is based on *Mudarabah* contract whereby, the depositors provide the capital for the bank to invest in profitable business ventures which are legal and Shari'ah compliant. The depositor acts like the *Rab-ul-mal* or capital provider and the bank as the *Mudarib* or agent. These deposits have different maturity periods and when the Islamic bank makes profits, holders of time deposits will be entitled to receive a certain proportion of these profits. But, the depositor will also have to share in losses that the bank may incur.

As Mudarib, the bank uses its discretion in managing the affairs of the Mudarabah deposits and takes other necessary actions for the benefit of the deposits. The deposits are allocated by the bank to a number of investment pools where it puts the invested amount in Shari'ah-compliant businesses. The investment will go through the entire process of a business activity which involves risk taking at each stage. The Islamic bank bears all expenses related to general management and distributes the net proceeds between the pools and then among the depositors represented by the pool. How much profit each depositor earns depends on the final outcome of the bank's own investment; in fact, the bank proceeds to a constructive liquidation after the term or at the end of the accounting period, so that the joint relationship starts afresh for the next accounting period. The rate of return on a deposit in an Islamic bank is directly linked to the quality of the bank's investment decisions. Therefore, instead of promising depositors a predetermined fixed rate of return on their investment, the bank tells them only the ratio in which it will share the profits with them. Profits are calculated and accrued every month and paid on maturity of the deposit or as agreed between a depositor and the bank.

In relation to the above explanation, we can see that the savings theory works differently in Islamic bank as the profit rate in GIA is not predetermined unlike the FD rate. The depositors (as Rab-ul-mal) will be putting their money first and then upon maturity period only receive the profit, which actually depends on the final outcome of the mudarib's investment. So, we can see that the level of deposits placed in the Islamic banks will play an important role in determining the profit rate because the more deposits being placed, the more investment opportunities that the bank can have.

Therefore, this study attempts to fill in the gap of the existing studies which mostly support the conventional theories that the rate of return determines the level of deposits in the Islamic banks. It will investigate the Granger causal relationship between the amount of GIA deposits and the GIA profit rate in the Islamic banks in Malaysia. And also, to empirically measure whether the rates of interest available at conventional banks, as a substitute variable, and GDP, as proxy for income, have a direct influence on the level of deposits in Islamic banks.

The arrangement of the paper is as follows. Section 2 surveys the existing theoretical and empirical literature on the structural determinants of the aggregate personal savings rate that we consider in our empirical work and describes the specific variables that we use to represent these determinants. Section 3 examines the long-run relationships between the two measures of the personal savings rate and the variables identified in Section 2, using econometrics techniques. The final section of the paper summarizes our main results and comments on future research.

2. THEORETICAL CONSIDERATIONS

Rate of interest has always been featured as one of the important considerations in explaining the saving behavior of individual. Saving, according to Classical economists, is a function of the rate of interest. The higher the rate of interest, the more money will be saved, since at higher interest rates people will be more willing to forgo present consumption. Based on utility maximization, the rate of interest is also at the center of modern theories of consumer behavior, given the present value of lifetime resources. For a net saver an increase in the rate of interest will have an overall effect composed of two partial effects: an income effect leading to an increase in current consumption and a substitution effect leading to a reduction in current consumption (Hadjimatheou, 1987).

Keynes (1936) despite arguing the quantitative importance of the interest rate effect believes that in the long run substantial changes in the rate of interest could modify social habits considerably, including the subjective propensity to save. Friedman (1957) in his neoclassical analysis of the consumption function suggested that the main variables determining the average propensity to consume are 'the rate of interest, the relative dispersion of transitory components of income and of consumption, the ratio of wealth to income, and the age and composition of consumer units'. In view of the importance of the rate of interest on consumption, many researchers using various methodologies try to establish the strength of relationship between these two elements. Wright (1967), Taylor (1971), Darby (1972), Heien (1972), Juster and Watchel (1972), Blinder (1975), and Juster and Taylor (1975) in their studies found an inverse relationship between interest rate and consumption. Modigliani (1977) based on his works and after seeing evidence on the effect of interest rate on consumption concludes that the rate of interest effects on demand, including the consumption component, are pervasive and substantial.

In Islamic practice, the decision to place deposits with Islamic banks is not because of a profit motive but rather to gain the blessing of Allah. One of the ways to gain this blessing is to support any program that will improve Muslim communities. Since Islamic banks operate on an interest-free basis and their establishment is designed to improve Muslim communities, Muslims who support these banks are therefore considered people who achieve salvation as indicated by Verse 20 of Al Tawbah.

In Islam, wealth is a bounty from Allah and is a tool that may be used for good and evil. Poverty is, in some instances, associated with disbelief and riches are considered a gift from Allah. Wealth itself is considered as an important means by which man can pave the way for the attainment of his ultimate objective. The methods of earning, possessing, and disposing of

wealth, however, must be in line with the Shariah. The best method of accumulating wealth as defined by Shariah is by striving to succeed on one's own and not from the income generated from other peoples' efforts. (Haron, 2002)

3. LITERATURE REVIEW

Despite an extensive literature on savings behavior, there are not many recent studies, which specifically focus on the relationship between Islamic banks deposit (GIA), deposit rate of return (GIA profit) in Islamic banks, interest rate (FD Rate) of conventional banks and GDP especially in relation to Islamic banks in Malaysia. Most of the similar researches were done way back using the data from 1980s to 2004. Although not recent, there are few literature that can be cited as similar to the studies conducted, for example, in Malaysia, Haron and Shanmugam (1995) examine the relationship between rate of return offered by Bank Islam Malaysia Berhad and the level of deposit in the bank over the period 1983-1993. The result shows an inverse relationship between the variables, implying that Islamic bank customers did not consider returns from the deposit as an incentive to maintain funds with the banks. More recent study by Haron and Ahmad (2000) further provide support to the conclusion that Islamic bank customers are guided more by the profit motive. By expanding the previous study to include all funds deposited in the Islamic banks in Malaysia, the result of the study indicates that the rates of profit have a strong positive relationship with Islamic banks' deposits, while the interest rates have a strong negative relationship with it. The result of this study is confirmed by Sukmana and Yusof (2005) who performed the same study for all Islamic banks in Malaysia from January 1994 to October 2004.

In Indonesia, Mangkuto (2004) applied a similar study for the case of Bank Muamalat Indonesia. The study examines the effect of mudarabah deposit yield in the bank and interest rate in the conventional bank on the level of the Islamic deposit. Positive correlation between the level of the deposit and its yield is found during January 2000 - July 2004 period, indicating that higher return leads to higher level of the deposit. In contrast, the conventional interest rate is negatively correlated with the deposit yield, implying the importance of conventional interest rate in influencing the decision to save in the Islamic banks. This implies the existence of profit motive among the Islamic bank's depositors. The scope of the study is later widened by Rohmah (2006) to cover all Islamic banks in Indonesia from March 2000 to February 2006. Using Autoregressive Distributive Lag (ARDL) model, it is shown that the mudarabah investment deposit in the Islamic banks are cointegrated with return of the Islamic deposit, interest rate of the conventional banks' deposit, number of Islamic banks' branches, and national income in the long-run.

In India, Athukorala and Sen (2003) ascertained that except for the changes in the external trade, factors such as rate of growth, real interest rate on bank deposits, spread of banking facilities and inflation had significant positive relationship with savings. Loayza and Shankar (2000) used cointegration approach in measuring the relationship between savings in India and factors such as real interest rate, per capita income, the dependency ratio, financial development, the government saving rate, and the share of agriculture in gross domestic product (GDP). Their results revealed that real interest rate, per capita income and the share of agriculture in GDP had a positive relationship with savings, whereas inverse relationship were found for financial development, inflation and the dependency ratio.

Although some empirical research have found that people who patronize Islamic banks look for monetary rewards, this is not necessarily true for all cases. In 1984, Kuwait Finance House did not distribute any profit to their depositors, but there was no evidence of massive withdrawal of deposits. Similarly, Islamic banks in Sudan never reward their current account holders, but a bulk of their funds is supplied through these facilities. As institutions whose foundations are based on religious doctrines, it is paramount for Islamic banks management to believe there are other factors that dominate the economic behavior of Muslims. These principles comprise the belief in the day of Judgment and the life in the hereafter, the Islamic concept of riches, and the Islamic concept of success. All of these principles are expected not only to have a significant impact on the decision-making process of Muslims, but also to have an influence on their perceptions of Islamic banks.(Haron, 2002)

4. METHODOLOGY

4.1 Data Descriptions

This study uses monthly data since January 2007. The explanatory variables selected for this study are: profit rates on GIA, total individual GIA deposits, fixed deposit rates of return and Gross Domestic Products (GDP). The data were taken from the monthly statistical bulletin of Bank Negara Malaysia (www.bnm.gov.my).

In the beginning of the study, we actually chose not only the above said variables but some other variables that we think might have an impact in determining the GIA rates in the Islamic banks. Those variables are Kuala Lumpur Composite Index (KLCI), consumer price index (CPI) and money supply (M3) and BLR. As expected, having number of variables may expose the equation to multicollinearity problems. The t-statistics shows GIA rates are less significantly impacted by KLCI, CPI, BLR and M3; as such

we drop the variables – which left us with GIA rate, GIA deposits, FD Rate and GDP.

GIA deposits is the real level of mudarabah-investment deposit in Islamic banks, GIA profit rates is the real rate of return for 12-month mudarabah-investment and FD rate is the real interest rate for 12-month fixed deposit in conventional banks. Rates of profit for savings and investment account facilities of Islamic banks and interest rates on fixed deposit facilities of conventional banks are considered financial variables in most literature and have always been featured as one of the important considerations in explaining the savings determinants of individuals. Apart from that, the growth in the economy is being represented by GDP. Most empirical literature has shown an ambiguous relationship between savings and growth. Similarly, the direction of causality between these variables is still under much debate.

4.2 METHODOLOGY DESCRIPTIONS

The methodology employed uses various unit root tests, order of lag, Johansen's cointegration test and long run structural model followed by vector error-correction modeling, variance decompositions, impulse response functions and lastly persistence profiling. The model is being regressed using statistic software MicroFit 4.1.

5. ANALYSIS AND FINDINGS

Before starting to interpret the results, we had undertaken to set a certain rule in order to make interpretation consistent between models tested. Firstly, in testing the null hypothesis (that communicates the notion that

what had been thought to be true or observed in the past is due to random error), the significance level is set at 95%. If the P-Value is less than 5%, the null hypothesis is rejected and the alternative hypothesis is accepted.

The analysis of this study will start by looking at the trends of deposits from the raw data (refer to Appendix 1). We noted that on average, there had been fluctuating trends in the level of deposits beginning of the year 2007 and notably in the year of 2008, there were two major increased of about 25% in the deposits level – in January and August 2008. This could be due to the global financial crisis which reached its critical stage when major financial disaster - such as the subprime crisis, bankruptcy of Lehman's brothers, stocks market plunged - had caused financial panic to all across the globe. In Malaysia, the increased in the Islamic banks' deposits reflected the sentiments that the public were looking for a safer place for their money. Most of them turned to Islamic banks as they believed that based on the Islamic principle, these banks were backed by real assets/underlying assets unlike the conventional counterparts. Even, those who are inclined to invest in share markets moved their funds to a less risky instrument – e.g. GIA or FD, which being proven by the downtrend in KLCI during that period.

In May 2009, there was a high increase of 11% in the level of deposits as the government gave new licenses to few banks to fully operate an Islamic bank, as such more choices were available to depositors. However, in the middle of 2010, there had been a sharp decline in deposits of about 12%. During that year, 2010, the Bank Negara Malaysia had raised the OPR for three times. This can be seen from the BLR data where the BLR had increased by 25 basis points since the beginning of the year. Due to this, most depositors felt that the logical thing to do was to use their savings to reduce some of the loans that they were servicing.

Now, let us look at the tests that had been conducted on the models and alteration made in order to overcome problems in this time series model.

5.1 TESTING THE NON-STATIONARITY/ STATIONARITY OF EACH VARIABLE

Time series analysis requires stationary data. Stationarity is a condition of time series which has constant mean and variance distribution overtime (Gujarati, 2003). Regressing non-stationary time series may lead to problems of spurious regression hence the conventional statistical tests such as r^2 , t-test are not valid. If the variables are non-stationary but cointegrated, the ordinary regression without the error correction term derived from the cointegrating equation is misspecified. Thus, to avoid the problems, we employ the commonly used Augmented Dickey-Fuller (ADF) and Phillips-Peron (PP) unit root tests which allow the differentiation of the variables until the stationary condition is achieved. In order to proceed with the testing of cointegration later, ideally, our variables should be I(1), in that in their original level form, they are non-stationary and in their first differenced form, they are stationary. The differenced form for each variable used is created by taking the difference of their log forms.

Level log form – ADF Output

Variable	Test Statistic	Critical Value	Result
GIA Deposit	-1.2745	-3.5189	Variable is non-stationary
GIA Return	-1.9898	-3.5189	Variable is non-stationary
FD Rate	-1.5437	-3.5189	Variable is non-stationary
GDP	-1.6731	-3.5189	Variable is non-stationary

Differenced log form – ADF Output

Variable	Test Statistic	Critical Value	Result
GIA Deposit	-5.3496	-2.9339	Variable is stationary
GIA Return	-5.8051	-2.9339	Variable is stationary
FD Rate	-3.0952	-2.9339	Variable is stationary
GDP	-4.2231	-2.9339	Variable is stationary

The null hypothesis for the ADF test is that the variable is non-stationary. In all cases of the variable in level form, the test statistic is lower than the critical value and hence we cannot reject the null. On the other hand, in all cases of the variable in differenced form, the test statistic is higher than the critical value and thus we can reject the null and conclude that the variable is stationary (in its differenced form). Relying primarily on the AIC and SBC criteria, the conclusion that can be made from the above results is that ***all the variables we are using for this analysis are I(1)***, which indicates that the variables have an infinite variance (it grows over time), shocks are permanent and its autocorrelation tend to be unity, thus we may proceed with testing of cointegration.

5.2 DETERMINATION OF THE ORDER (OR LAGS) OF THE VAR MODEL

CHOICE CRITERIA	OPTIMAL ORDER
AIC	4
SBC	2

We chose the optimum lag – variables are in the log differenced form - corresponding to the highest value of AIC and SBC as the selection criteria. Normally SBC will select a lower order compared to AIC. Although the result shows the optimal order is 4 and 2 under AIC and SBC, respectively, we however decided to choose lag order 1 as the optimum lag because of

the small data/observations to avoid the risk of parameterization, and also to lower the loss in the degree of freedom.

5.3 TESTING COINTEGRATION

Cointegration implies that the relationship among the variables is not spurious i.e. there is a theoretical relationship among the variables and that they are in the equilibrium in the long run. It also indicates that each variable contains information for the prediction of other variables. However, although cointegration indicates the presence or absence of Granger-causality, it does not indicate the direction of causality between variables. This direction of the Granger (or temporal) causality can be detected through the vector error correction model derived from the long run cointegrating vectors.

In this analysis, we employ the Engle Granger and Johansen and Juselius JJ procedure of testing for the presence of cointegrating vectors. In Engle-Granger method we are testing the stationary on the residual whereas under Johansen method, determination of cointegration is derived from Maximal Eigenvalue and Trace statistics.

Variable	Test Statistic	Critical Value	Result
Residual	6.5156	3.5217	Variable is stationary

From the above Engle-Granger test, we found that at lag 1 the residual is found to be stationary which implies that there is one cointegrating relationship in this model.

Criteria	Number of cointegrating vectors	T-Stat	95% Critical Value
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Maximal Eigenvalue	1	17.117	25.42
Trace	1	32.7118	42.34
AIC	3		
SBC	1		
HQC	3		

In the case of Maximal Eigenvalue and Trace, the test statistic for null of $r = 0$ is greater than the 95% critical value whereas for alternative hypotheses, t-statistic is less than the critical values. If the null hypothesis $r=0$ is accepted, it implies that there is no cointegration among the variables. For AIC, SBC and HQC, the number of cointegrating vectors is obtained by locating the highest numbers. From the above table, we can conclude that there exists **one** cointegrating relationship among the variables at 95% significance level between the variables – based on majority results. The evidence of a cointegrating relationship implies that there is a common force that brings variables together in the long term. Cointegration implies that these variables are interdependent and highly integrated. If the result shows no cointegration – the variables are not found to be cointegrated – they maybe fractionally cointegrated. To solve this, one may change the number of lags or change the variables.

5.4 LONG-RUN STRUCTURAL MODELLING (LRSM) –

After we have determined the number of lags and cointegrating relationship, we use Long-Run Structural Modelling to estimate theoretically meaningful long-run (or cointegrating) relations among the variables based on theories. We impose restrictions on identifying and over identifying to see the relations of the variables based on theories. The exact identifying on the variables is on GIA Rate i.e. $A_1 = 1$.

Variable	Coefficient	Standard Error	t-ratio	Implication
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GIA Rate	1	NONE		
GIA Deposit	.22019	.070160	3.138	<i>Variable is significant</i>
FD Rate	-.27455	.10687	2.56	<i>Variable is significant</i>
GDP	.088952	.39082	0.23	Variable is insignificant

The result shows that the GIA Deposit and the FD Rate is significant, showing that these two variables affect the normalized variable (GIA Rate), so we keep these variables in the equation. To further test the significance of GDP, the over identifying restriction is applied on GDP, $A_4=0$. With this restriction, the other entire variable is significant, except for GDP is still not statistically significant with $CHSQ(1) = .050445[.822]$ hence suggest that the restrictions cannot be rejected. Intuitively, we are more inclined to believe that GDP is a significant variable. This is due to the fact that income is reflected by GDP and without income; there will be no deposits, as such no returns to be given. Hence, we keep that variable.

5.5 VECTOR ERROR-CORRECTION MODELLING (VECM)

Vector error correction model allows us to ascertain which variables are in fact exogenous and which are endogenous. At least one of the ECM terms should be significant for the validity of the cointegrating relationship among the variables in the long term. If the error correction coefficient in any equation is insignificant (using t-test), that implies that the corresponding dependent variable of that equation is “exogenous”. It means that the variable does not depend on the deviations of other variables and that it is a leading variable and initially receives the exogenous shocks resulting in deviations from equilibrium and transmits the shocks to other variables. But if the coefficient is significant, it implies that the corresponding dependent variable is “endogenous”. This variable depends on the deviations of other variables and that it bears the brunt of short-run adjustment to bring about the long-term equilibrium among the

cointegrating variables. The size of the coefficient of the error correction term indicates the speed of a short term adjustment to bring about long term equilibrium and it represents the proportion by which the disequilibrium in the dependent variable is being corrected in each short period. The size is also an indicative of the intensity of arbitrage activity to bring about equilibrium.

Variable	ECM(-1) t-ratio p-value	Implication
GIA Rate	-5.1876[.000]	Variable is endogenous
GIA Deposit	-1.6571[.104]	Variable is exogenous
FD Rate	-.38882[.699]	Variable is exogenous
GDP	1.0425[.303]	Variable is exogenous

By examining the error correction term, e_{t-1} , for each variable, and checking whether it is significant, we found that **there is only one endogenous variable, GIA Rate**, as depicted in the table above. The other variables were found to be exogenous. This shows that the GIA Rate is being determined by the GIA Deposit, FD Rate and GDP. However, VECM cannot tell us the relative degree of endogeneity and exogeneity of the variables. Although the result seems to be different than the normal theory which indicates that savings rate is normally the exogenous variable i.e. being determined by the amount of deposits placed in banks, we take the initiative to run the test using conventional data, and below is the result for VECM test:

Variable	ECM(-1) t-ratio p-value	Implication
SavingsRtn	-5.6550[.000]	Variable is endogenous
SavingsAmt	-.218401[.828]	Variable is exogenous

KLCI	-1.2086[.235]	Variable is exogenous
GDP	-0.90985[.370]	Variable is exogenous

The conventional data and the Islamic Data, both are giving the same result, that the rate of return is the endogenous variable. However, we are not going to dwell much on the result of the conventional data as that will be the extension of this study in the future.

5.6 VARIANCE DECOMPOSITIONS (VDCS)

Variance Decomposition (VDC) is a test that shows how endogenous or exogenous the variables are relatively. The VDC decomposes the variance of the forecast error of a particular variable into proportions attributable to shocks in each variable in the system including its own. The relative endogeneity or exogeneity of a variable can be determined by the proportion of the variance explained by its own past shocks. The variable which is explained mostly by its own shocks is deemed to be the most exogenous of all variables. The variable that have a lot of decomposed proportions in other variables are said to be endogenous. The least exogenous is the endogenous. Basically, we can generalized the or orthogonalised the VDC. The proportions in the orthogonalised are added up to become 100% while in generalized the proportions do not add up to 100%, as such one should make sure to convert the proportions will add up to 100%.

There are mainly two differences between the orthogonalised and the generalized VDCs. The orthogonalised VDCs are not unique and in general the results depend on the particular ordering of the variables in the VAR but the generalized VDCs are invariant to the ordering of the variables. The orthogonalised VDCs assume that when a particular variable is

shocked, all other variables in the system are switched off but the generalized VDCs do not make such a restrictive assumptions.

GENERALIZED FORECAST ERROR VARIANCE DECOMPOSITION

	GIA				TOTAL
	GIA RATE	DEPOSIT	FD RATE	GDP	
GIA RATE	0.48405	0.51341	0.16975	0.7707	1.93791
GIA DEPOSIT	0.30885	0.92541	0.002518	0.004569	1.24134
FD RATE	0.093755	0.0098803	0.99688	0.30012	1.40063
GDP	0.5081	0.0072756	0.22853	0.96895	1.71285

GIA RATE	25.0%	26.5%	8.8%	39.8%	100%
GIA DEPOSIT	24.9%	74.5%	0.2%	0.4%	100%
FD RATE	6.7%	0.7%	71.2%	21.4%	100%
GDP	29.7%	0.4%	13.3%	56.6%	100%

ORTHOGONALIZED FORECAST ERROR VARIANCE DECOMPOSITION

	GIA				
	GIA RATE	DEPOSIT	FD RATE	GDP	
GIA RATE	0.48405	0.39237	0.12358	0.001133	1
GIA DEPOSIT	0.30885	0.68834	0.00281	2.72E-05	1
FD RATE	0.093755	0.043559	0.86269	6.81E-07	1
GDP	0.05081	0.005923	0.31477	0.63383	1

GIA RATE	89%	11%	0%	0%	100%
GIA DEPOSIT	55%	42%	1%	2%	100%
FD RATE	3%	33%	64%	1%	100%
GDP	2%	1%	31%	67%	100%

From the above two tables, rows read as the percentage of the variance of forecast error of each variable into proportions attributable to shocks from other variables (in columns), including its own. The columns read as the percentage in which that variable contributes to other variables in explaining observed changes. The diagonal line of the matrix (highlighted) represents the relative exogeneity. According to these results, the ranking of indices by degree of exogeneity (extent to which variation is explained by its own past variations) is as per the table below:

No.	Generalized	Orthogonalized
1	GIA DEPOSIT	GIA RATE
2	FD RATE	GDP
3	GDP	FD RATE
4	GIA RATE	GIA DEPOSIT

The above ranking shows conflicting result. Firstly, we need to recognize the two important limitations of orthogonalized VDCs. It does not produce a unique solution as it assumes that when a particular variable is shocked, all other variables are “switched off”. The generated numbers are dependent upon the ordering of variables in the VAR. Typically, the first variable would report the highest percentage and thus would likely to be specified as the most exogenous variable.

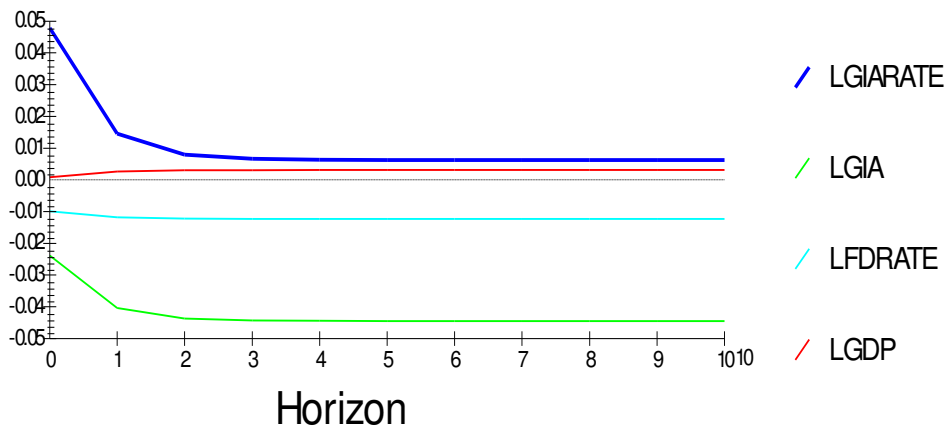
As for generalized VDC, it is unique and invariant to the ordering of variables, as such the result is more reliable. In this case, the result indicates that GIA deposit is the most exogenous, followed by FD rate and GDP. The least exogenous is the GIA Rate which implies that this variable

is the endogenous variable. This result is consistent with the result given by VECM test i.e. GIA rate is the endogenous variable.

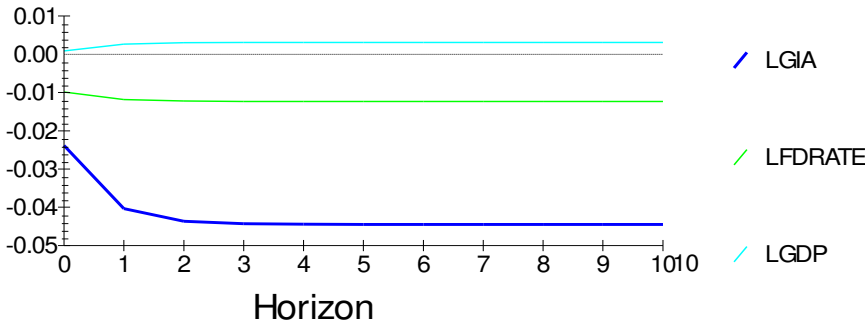
5.7 IMPULSE RESPONSE FUNCTIONS (IRFS)

The Impulse response function is the graphical representation of information contained in the VDCs. It will show the graphical expositions of the shocks of a variable on all other variables in orthogonalised and generalized forms. The IRFs essentially map out the dynamic response of a variable owing to one period standard deviation shock to another variable. The IRFs are normalized such that zero represents the steady-state value of the response variable. Once the individual variable is shocked, there is an increased disturbance however it does not die out over a time horizon of 10.

Generalized Impulse Response(s) to one S.E. shock in the equation for LGIARATE



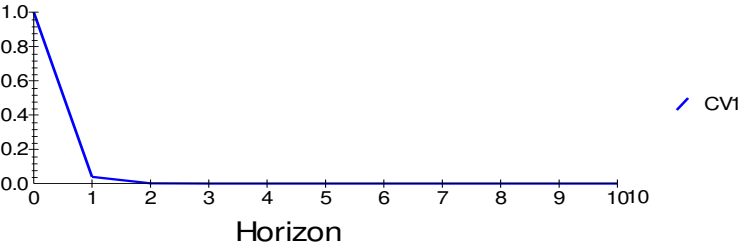
Generalized Impulse Response(s) to one S.E. shock in the equation for LGIARATE



5.8 PERSISTENCE PROFILES

Persistence Profiles (PFs) maps out the dynamic response path of the cointegrating vectors in long run. The Persistent Profile trace out the effects of a system wide shock on the long run relations between the variables. From this test we can find out the time horizon required for the equation to come back to equilibrium after the whole system has been shocked.

Persistence Profile of the effect of a system-wide shock to CV'(s)



The chart indicates that it would take approximately **two months** for the cointegrating relationship to return to equilibrium following a system-wide shock.

6. FINDINGS AND RECOMMENDATIONS

In the beginning of the study, we are not certain which variables will be the dependent or independent variables. Most theories and researches done on savings indicate that the level of savings is determined by the rates of returns, FD Rates and GDP – Haron & Shanmugam (1995). However, the results of this study highlight that the endogenous variable is the GIA profit rate and the level of deposits or savings, FD Rate and GDP are the exogenous variables. GIA deposits in the banks (as top determinant) play an influential role in determining the GIA profit rate in the Malaysian Islamic banks followed by FD Rate and GDP - proven from the VECM and VDC test result. This proves, among others, that the amount deposited in the Islamic banks (under mudarabah contract) play an important role as seed money for mudarib to invest in profitable business ventures which are legal and Shari'ah compliant. As Mudarib, the bank uses its discretion in managing the affairs of the Mudarabah deposits and takes all necessary actions for the benefit of the deposits. So how much profit each depositor earns depends on the final outcome of the bank's own investment; and is directly linked to the quality of the bank's investment decisions. Thus, we can see that the level of deposits placed in the Islamic banks will determine the profit rate because the more deposits being placed, the more investment opportunities that the bank can have. Note that, despite these notable findings, the results of the study should be interpreted within the macro framework during the period of observation because it is indeed a generalized and aggregated study for Islamic banking industry in Malaysia.

From the LRSM test, the results show that the GIA profit rate has positive relationship with the GIA deposit and GDP; while negative relationship with the real interest rate on conventional deposit (FD Rate). This implies that the depositors regard profit as one of the main motives to save in the Islamic deposits. This result is consistent with other researches done by Haron & Ahmad (2000) and Sukmana and Yusof (2005). However, from the earlier

researches on the behavioral study of Islamic depositors, the decision to place deposits in Islamic banks is not only to earn profit but also to get the blessing of Allah SWT. They are concerned about putting their savings in a Shariah compliant instrument which is less risky but able to offer some amount of profit. In line with Shariah principle, rates of profits on GIA are only made known to depositors at the end of maturity period; as such placements of deposits are already being captured although at the end of the maturity period, the profit is not as attractive. Islam encourages people to save, so regardless of the profit rate, people still continue placing their money in the Islamic banks.

Under normal circumstances, when profit rate of Islamic bank is much higher than the conventional bank, their depositors tend to withdraw their funds and move their deposits to the Islamic banks. Hence explains the negative relationship between the GIA profit and fixed deposit rate. The same thing happens as the profit rates of Islamic bank falls, Islamic banks will try to match the rates offered by conventional banks to keep their depositors from withdrawing their funds.

As for the GDP, the positive relationship signifies that the higher growth in GDP will lead depositors to save more, and when this happens, the profit rates offered will be more attractive as the source of funds for the banks appreciates. However, causality between these variables is still under much debate. The simple permanent-income theory postulates that higher growth reduces current savings because of higher anticipated future income. Thus, urging people to dissave against future earnings. But in the life-cycle model, growth has an ambiguous effect on savings, depending on which age cohorts benefit the most from the growth, how steep their earning profile are, and the extent to which borrowing constraints apply.(Haron, 2004)

Since the findings suggest that profit is one of the motives for depositors in choosing the Islamic banks, the banks must take this matter seriously. The existence of such motive has many implications, one of which is the

tendency of depositors to withdraw their fund and remove it to conventional bank or to other Shariah instruments if the latter offers higher return. The market has a lot more to offer with the tremendous growth of Shariah instruments from unit trusts and fund management industry. As depositors enjoys dividends and capital gains, more surplus funds are now moving from the bank deposits to these growing sectors. A further investigation reveals that Islamic banks are facing a risk called, displaced commercial risk¹ – an exposure when the Islamic banks are under market pressure to pay a return that exceeds the rate that has been earned on assets financed or when the return on assets is under-performing as compared with competitors' rates. This situation, if not managed properly, has a potential to lower growth of the Islamic banks.

The findings of this study reveals two main important implications to the Islamic banks - Firstly, **on the risk management practices** - as banks will be facing with displaced commercial risks that will trigger a need for a higher PER² and IRR which might jeopardize their growth. To mitigate this risk, instead of keep on placing more reserves, the Islamic banks can start an initiative to increase public knowledge and to educate and motivate their customers to save/invest in halal activities, even if this has some worldly costs – targeted to customers who disregard religious factor in placing their deposits and those who are risk averse. They need to be made aware that the investment choices should not only be based on the profit maximization but also on those returns in the hereafter. And for those non-Muslims customers, the banks can emphasize on the concepts adopted by Islamic banks, e.g. profits sharing, partnership, asset backed/based.

Islamic banks might also need to improve and enhance their services probably by introducing a one-stop centre by offering for example wealth management

¹ (IFSB, 2005, Guiding Principles of Risk Management for Islamic Financial Institution. p. 23).

² An amount set aside by the Islamic financial institutions out of their gross income in order to maintain a certain level of rate of return for their depositors.

services to cater for their depositors' needs in managing their finances. Wealth management is considered as one of the growing industries, and a good source of income, as the coverage is comprehensive – e.g. investment planning, retirement planning, takaful planning and estate planning. More so, the government has identified wealth management under the Economic Transformation Program (ETP) as one of the critical sub-sector (under financial services). With the government support, a well established Wealth Management services in the Islamic banks not only can generate new business opportunities and revenue but also might keep existing customers from moving out their funds.

Secondly - **a good asset-liability management practice** – where while maintaining competitiveness, the banks are not to forgo efficiency and profitability. The banks' management should watch carefully the performance of their financings to gain optimal revenue and at the same time; they must also improve their efficiencies especially in their investment strategies as the rate of return on deposit in the bank is directly linked to the quality of the bank's investment decisions.

In the long-run, these two practices, if not given the utmost concern could potentially limit, or even deteriorate, development of the Islamic banking industry in Malaysia.

7. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Limitation of this study shall be discussed in this section as to caution the reader on the areas not being covered. As faced by other researchers, this study is subject to availability of data used to test the relationship between the dependent and independent variables. As there is limitation of data on Islamic banks and resources, we only considered data that is published online and freely available to researchers without having the need to formally request for in-depth information from relevant sources. Therefore, the choice of variables is somewhat arbitrary hence the result might not be as comprehensive or as accurate. However, to justify the result, we have taken an initiative to use conventional data to back up our findings. The conventional result shows consistency with the Islamic data result; that the level of deposits in banks is the exogenous variable and rates of return are the endogenous variable. The extension this study on the findings of the conventional and Islamic results will be done in the future.

Among the other area that future researchers can look at from the result of this study, are on the area of risk management particularly in managing risks associated directly with the Islamic banks – displaced commercial risks, rate of return risks, reputational risk and most importantly Shariah risks. An adoption of effective risk management systems together with efficient assets-liability management can ensure a sustainable growth in the long run for the Islamic banks and act as a catalyst for an efficient performance of the entire financial industry.

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