The finance-growth nexus: is finance supply-leading or demand-following in islamic finance ? evidence from Malaysia

Ibrahim, Norhaslina and Masih, Mansur

INCEIF, Kuala Lumpur, Malaysia, UniKL Business School, Kuala Lumpur, Malaysia

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Norhazlina Ibrahim[1] and Mansur Masih[2]

Abstract

This paper attempts to investigate the Granger-causality between Islamic banks and economic growth. Malaysia is taken as a case study. The methodology adopted is the standard time series techniques. The results tend to suggest that Islamic bank financing leads growth and other variables, being the most exogenous compared to others. In other words, the finance is supply-leading rather than demand-following in the context of Islamic finance in Malaysia. Thus, this finding has clear policy implications for the government to keep on enhancing Islamic banks' development leading to a positive economic growth.

Keywords: *GDP, Islamic Banks, Vector-Error Correction Model, Long Run Structural Modelling, Variance Decompositions*

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

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

Email: mansurmasih@unikl.edu.my

1.0 Introduction

In Malaysia, a relatively recent development in the financial sector is the rapid development of the Islamic banking and finance industry. Despite its recent history, Islamic banking has staged a very impressive growth. This is well reflected by high growth of the asset of the Islamic banking industry in Malaysia growing by approximately 30 percent per annum since its inception in 1983. At the same time Malaysia economy has experienced growth in GDP as well. Malaysia's average quarterly GDP growth was 1.20 percent reaching an historical high of 5.70 percent in September of 2009 and a record low of -7.80 percent in March of 2009[1].

The scepticism whether or not Islamic banks clearly contribute to economy is yet to be resolved. Now the crucial question is whether the development of Islamic banks encourages economic growth or vice versa. In the first scenario, the supply leading hypothesis, financial sectors act as *"supply-leading"* to transfer resources to promote and stimulate growth by supplying financial aid to the economy. On the other hand, the second scenario known as *"demand-following"* hypothesis implies that an increase in economic growth eventually will lead to more financial services being demanded (Masih et al., 2009).

Nevertheless, the debate whether the financial sector leads economic growth or vice versa has important policy implications for both developed and developing countries. Many studies (Patrick, 1966; Schumpeter, 1911; Robinson, 1952; Masih et al., 2009;

[1] Retrieved from http://www.tradingeconomics.com/Economics/GDP-Growth.aspx?Symbol=MYR as at 20 April 2011

Yang Y.Y. and Yi M.H., 2008; Calderon and Liu, 2003; Demetrides & Hussein, 1996; Furqani, H. and Mulyany, 2009; Muhsin Kar et al., 2010; Y. Khalifa Al-Yousif, 2002) investigate the causality between financial development and economic growth. The importance of these studies could assist governments in prioritizing which reforms should be embarked in the financial sectors. Which theory to follow will confer different implications. According to Muhsin Kar et al. (2010), the proponents of the *supply-leading* suggest that government policies should be directed towards improving financial system, since financial development has important causal effects on growth. On the other hand, the supporters of the *demand-following* conquer that the financial development is actually the outcome of economic growth, thus any policies in improving financial development will have only a little effect on growth.

In view of the increasing presence of Islamic banking in the Malaysian financial landscape, it is indeed timely to investigate which hypothesis best explains the relevance of Islamic banking to Malaysian economy. To my knowledge, there are few studies[2] done in Malaysia to investigate the impact of Islamic banks on economic growth. The result will aid the policy makers in coming out with the best solution in promoting the growth of Islamic banks.

1.1 Development of Islamic Banks in Malaysia

The rapid growth of the Islamic banking and finance industry in Malaysia are made possible with the full backing support by the Malaysian government. The government has provided a strong foundation for the industry to grow such as establishing the financial and legal platform for the rapidly growth industry. The

[2] Furqani, H. and Mulyany (2009)

history of Islamic banking and finance in Malaysia started with the establishment of the Pilgrims Management and Fund Board (PMFB) which represents the pioneer interest-free financial institution in the country (Sukmana and Kassim, 2010). The PMFB was set up in August 1969 with the main role of providing a systematic fund mobilization saving for the Muslims enabling them to perform annual pilgrimage in Makkah, simultaneously, persuading them to take part in economic activities and investment opportunities. Since then the awareness of shariah compliant products and services has escalated and more of these products are being demanded. This request was well responded by the government by establishing a steering committee to study its possibility in 1982. In the following year, a comprehensive Islamic financial system has been established which operates in parallel with the conventional financial system. This dual banking model has been enshrined in the Central Banking Act 2009 following recent enhancements, thereby giving significance and due prominence to Islamic finance.

The new Islamic Banking Act (IBA) was enacted in 1983 and lead to the establishment of the first Islamic bank in Malaysia, Bank Islam Malaysia Berhad (BIMB) in the same year. Progressively Islamic bank has played an important role for the overall Malaysian financial market. This can only be achieved with a strong institutional infrastructure and effective legal, regulatory and Shariah (Bank Negara, 2011). In terms of market share, the Islamic banking system in Malaysia currently accounts for 20 percent of our banking system. Total assets of the Islamic banking sector amounted to RM350.8bil as at end-2010, increasing by 15.7% from end-2009.The Islamic banking sector now accounts for over 20% of

the overall banking system in terms of assets, financing and deposits. At present 27 banking institutions (9 Islamic banks and 18 conventional banking institutions) are offering Islamic banking products and services under the Islamic Banking Scheme (Bank Negara, 2010).

2.0 LITERATURE REVIEW

For many years the correlation between financial development and economic growth has been studied. The crucial question is does financial development promote economic growth or does economic growth promote financial development? These theoretical discussions reveal that there is no consensus on the direction of causality between them. Patrick (1966) identified two possible patterns in the causal relationship between financial development and economic growth. The first one is called *demand-following* which means that when there is economic growth eventually it will induce more and more establishment of modern financial institutions. This will lead to the demand for these services by investors and savers in the economy (Patrick, 1966). This theory is initiated by Robinson (1952) who argues that finance does not exert a causal impact on growth. Instead, financial development follows economic growth as a result of higher demand for financial services. When an economy grows, more financial institutions, financial products and services emerge in the markets in response to higher demand of financial services.

The second one is classified as *supply-leading* which means the establishment of financial institutions and their financing will stimulate growth by transferring these resources to entrepreneurs and economy as a whole (Patrick, 1966). This theory can be rooted back from Schumpeter (1911) who contends that the services provided by

financial intermediaries are essential drivers for innovation and growth. A well developed financial system channels financial resources to the most productive use.

Basically the studies on the relationship between financial development and economic growth can be segregated into 4 main groups. The first group favours *a supply-leading* hypothesis, whilst *demand-following* hypothesis is fully supported by the second group. The third group argues that the causality is bidirectional, and last group believes financial development has no connection at all to the growth. In the following section, we will explore these 4 groups in great detail.

2.1 Supply-leading

Masih et al. (2009) findings are in line with supply-leading theory. Their study are conducted in Saudi Arabia and support the pioneering work of Patrick (1966) who concluded that a *supply-leading* condition is likely to prevail at the early stage of economic development, while a *demand-following* condition is likely to prevail at the later stage of economic development. This is due to the fact that the financial development is still at the early stage in Saudi Arabia. The major policy implication of their findings is that a pro-active policy of growth and reform of the financial sector will help enhance economic growth in an open developing economy.

Calderon and Liu (2003) found that financial development enhances economic growth for all countries. However, when they split the sample into developing and industrial countries, they found evidence of bidirectional causality. Yang Y.Y. and

Yi M.H. (2008) provide evidence that financial development causes economic growth, but the reverse is not true in Korea.

2.2 Demand-following

Robinson (1952) and Demetrides & Hussein (1996) states that financial development follows economic growth or "where enterprise leads finance follows". A study done in Malaysia by Furqani, H. and Mulyany (2009) also supports *demand following* hypothesis where financial development follows economic growth. Under this hypothesis, economic growth creates a demand for financial intermediation and causes Islamic banking institutions to change and develop.

2.3 Bidirectional causality

Muhsin Kar et al.(2010) investigates the direction of causality between financial development and economic growth in the Middle East and North African (MENA) countries for the period 1980–2007. In order to capture the different aspects of financial development, six different indicators are used. The empirical results support evidence on both demand-following and supply-leading hypotheses. Therefore the direction of causality seems to be country and financial development indicator specific. Y. Khalifa Al-Yousif (2002) also arrived at same conclusion and strongly support the view that financial development and economic growth are mutually causal, that is, causality is bidirectional. Moreover, the findings of the present paper accords with the view of the World Bank (1993) and other empirical studies that the relationship between financial development and economic growth cannot be generalized across countries because economic

policies are country specific and their success depends, among others things, on the efficiency of the institutions implementing them.

Most of these studies are using deposit of the banks, money supply as the measurement to financial development; however we are using Islamic Financing as our indicator for financial development variable. As mentioned earlier determination which hypothesis to follow will eventually aid the policy make in making the wisest decision. However the previous studies fail to provide a direct answer and arrive at compromised conclusion. The recent study (as far as the knowledge of the author) did not apply the recent technique of LRSM and the years covered are not recent as this study attempt to accomplish.

3.0 RESEARCH METHODOLOGY

Most of previous studies used regression analysis. In this study we use time series techniques, to overcome the regression limitations and time series has proven to surpass regression technique. To enhance our finding we are applying Long Run Structural Modelling, the techniques that can test the coefficient against the theoretical expectation. For the purpose of this study we use monthly time series data from 2000 – 2010.

As regards to the variables of interest, we use GDP to indicate the economic growth. Since the data extracted is quarterly, and other variables are all in monthly form, we used the cubic spine interpolation[3] technique to interpose the quarterly data into

[3] This technique uses a special software

monthly data. For the purpose of this study, Islamic Banks Total Financing (IBS)[4] is used to represent financial development and three control variables deemed to have a theoretical relationship to GDP. They are Money Supply (M3), Industrial Production Index (IPI) and Interest Rate (INTRATE). Most of the data are gathered from Datastream and Monthly Statistical Bulletin of Bank Negara Malaysia.

As in any time series estimation procedure, there are several pre-tests conducted before more rigorous investigation techniques are adopted. The steps undertaken are the unit root test, order of Vector Autoregression (VAR), cointegration tests, followed by Long-Run Structural Modelling (LRSM), Vector-Error Correction Model (VECM), Variance Decomposition (VDCs) analysis, Impulse Response Functions (IRF) and Persistence Profiles (PP). The details of these tests are elaborated in the following sections.

3.1 Step 1: Unit Root Test

Unit root test is probably important step in determining whether or not the variables are stationary or not. It is a known fact that regression neglect this test, thus confirmed its major limitation. Moreover, it is also a well known fact that almost all financial data are non-stationary in their original form. Thus by applying regression, when the variables are non-stationary will resulted to dangerous implication, all results of conventional statistical tests derived from F-test, t-test, R^2 are misleading (Masih et al., 2010). If the variables are non-stationary, the means, variances and co-variances of these variables are changing (not constant) and the relationship estimated will be "*spurious*".

[4] These data are retrieved from Bank Negara Website

The authors further added that if regression uses "*differenced*" variables (which will be stationary) the conclusions drawn from such an analysis will be valid only for the short run and no conclusions can be made about the (long-run) theoretical relationship among the variables since the theory has typically nothing to say about the short-run relationship. In another words, the trend element has been eliminated, thus defeat the objective of the study in testing theory. Masih et al. (2010) stated the regression analysis that has been applied for many decades in time series studies is now considered to have either estimated a spurious relationship (if the original "*level*" form of the variables was non-stationary) or estimated a shortrun relationship (if the variables were "*differenced*"). Thus, the unit root test is very important in the context of time series analysis so as to check the level of stationarity of the data as to advance further in testing the cointegration. In this study Augmented Dickey Fuller (ADF) is being applied.

3.2 Step 2: Order of Vector Autoregression (VAR)

However, before embarking to cointegration test it is important to determine the relevant VAR order. There are some criteria used in selecting the VAR lag length: Akaike's Information Criterion (AIC) and the Schwarz Bayesian Criterion (SBC). The lag length used should be long enough to confine the dynamics of the system and at the same time, it should not be too long to exhaust the degree of freedom.

3.3 Step 3: Cointegration test

Cointegration can only be done if the variables are non-stationary in level form. There are 2 most commonly used cointegration tests, namely the *Engle-Granger* (EG) and *Johansen and Juselius* (JJ) tests. EG uses residual analysis assumes only one cointegration, however JJ on the other hand adopts Trace and Maximum

Eigenvalue, able to identify more than one cointegration. In this study both are being adopted to examine the cointegration.

Cointegration is said to exist if the variables of interest are linked to form an equilibrium relationship in the long-run, even though they are non-stationary. If there is an evidence of cointegration, they will in the long run move closely together over time and difference between them will be stable. Even though as mentioned earlier, examining non-stationary variables may result in spurious result however, if the residual of the model is found to be stationary, then the variables is said to have co-movement in the long run or they have a long-term equilibrium relationship. Examining residuals are mainly falls under Engle Granger test. This cointegration test is adopted in such a way as to examine the long-run theoretical or equilibrium relationship and to rule out spurious relationships among the variables (Masih et al., 2010).

3.4 Step 4: Long-Run Structural Modelling (LRSM)

Variance error-correction/ variance decompositions methods is mainly based on the estimates of the cointegrating vectors, which are *"atheoretical"* in nature. So other techniques attacked the limitation of conventional cointegrating estimates. Nonetheless, Pesaran and Shin, (2002) developed long-run structural modeling technique takes care of that major limitation. This step is known as LRSM basically testing the theory (Long run relations) by imposing on those long-run relations and then testing both identifying and over-identifying restrictions based on theories and a priori information of the economies (Masih et al., 2009).

3.5 Step 5: Vector-Error Correction Model

However, the evidence of cointegration cannot tell us which variable is leading (exogenous) and lagging (endogenous). This can only be done using the vector error correction model (VECM) in indicating the direction of Granger causality both in the short and long run. VECM can indicate the significant of such variables in the long run and short run. The short run is identified by differenced variables, whilst error correction (ECM) coefficient represents the long run. Another important indicator is the value of coefficient of ECM indicates the speed of the cointegating variables move to the equilibrium.

3.6 Step 6: Variance Decomposition

VECM can tell us which variable is endogenous or exogenous but incapable of detecting the relativity of these variables in term of exogenous or endogenous. Fortunately, the variance decomposition (VDC) technique is designed to meet this specification in indicating the relative exogeneity/endogeneity of a variable. This technique decompose (or partition) the variance of the forecast error of a variable into proportions attributable to shocks (or innovations) in each variable in the system, including its own. In short, the variable that is explained mostly by its own shocks (and not by others) is deemed to be the most exogenous of all.

3.7 Step 7: Impulse Response

On different platform, the variance decompositions can also be represented equivalently by the impulse response functions (IRFs). This method uses graphical presentation instead. They are designed to map out the dynamic

response path of a variable due to a one-period standard deviation shock to another variable. The IRF is a graphical way of exposing the relative exogeneity or endogeneity of a variable.

Basically, an IRF measures the time profile of the effect of shocks at a given point in time on the (expected) future values of variables in a dynamical system (Pesaran and Shin, 1998. For the purpose of this study, we are interested to analyze the responses of the objective variables, GDP to a shock in the financial development, represented by Islamic Banks Financing.

3.8 Step 8: Persistence Profiles

In IRF, we trace out the effects of one variable on the long run relationship, however in the persistence profiles, we shock the whole cointegrating equation and it enables us to estimate the speed with which the variables get back to equilibrium.

4.0 ANALYSIS AND RESULTS

As mentioned earlier, there are 5 variables used to achieve our objective. They are GDP, IPI, M3, IBS and INTRATE. All the variables except interest rate (already in the rate form) are transformed into logarithm, despite this transformation they still remain in level form. To examine the unit roots of the time series variables, we employ Augmented Dickey-Fuller (ADF) tests suggested by Dickey and Fuller (1979). We tested the unit roots of all the variables on the basis of ADF tests and found that they are non-stationary in the level form and stationary in the first difference based on the following null hypothesis:

H_0: The variable is non-stationary (unit root)

The results of the unit root tests are presented in Table 1 and 2[5]. It can be seen that all variables are stationary in the first difference or simply, are I(1) process. Result from Table 1 is gathered from The Dickey-Fuller regressions with a linear trend[6], whereas in Table 2 the outcomes are extracted from The Dickey-Fuller regressions without a trend[7].

Table 1: Augmented Dickey Fuller Test Result (Level Form)

Test	LGGDP	LGIPI	LGM3	LGIBS	INTRATE
DF	-1.9206	-4.0570	-2.5812	-2.9131	-1.5157
ADF(1)	-8.4303	-2.2310	-2.9670	-2.5680	-1.9308
ADF(2)	-1.7266	-1.6594	-3.1183	-2.5085	-2.4447
ADF(3)	-3.2563	-1.7874	-3.1277	-2.4976	-2.4717
ADF(4)	-1.9812	-1.8610	-2.9649	-2.3991	-2.5123
ADF(5)	-1.0395	-1.9180	-2.8862	-2.3304	-2.5022
95% critical value	-3.4494	-3.4494	-3.4494	-3.4494	-3.4494

[5] For detailed result refer to Appendix 1.
[6] This is due to the fact that in level form the variables are in their level form thus contain trend element.
[7] When the variables are in differenced form, the trend element is no longer existed.

Table 2: Augmented Dickey Fuller Test Result (1st Difference)

Test	dLGGDP	dLGIPI	dLGM3	dLGIBS	dINTRATE
DF	-3.0460	-19.9905	-9.0156	-7.5123	-7.7964
ADF(1)	-13.5791	-12.7550	-6.5439	-5.4927	-4.8554
ADF(2)	-4.4583	-7.4053	-5.6963	-4.6998	-4.4111
ADF(3)	-8.3216	-5.8128	-5.5779	-3.5846	-4.0493
ADF(4)	-8.7979	-4.8988	-5.3036	-2.8209	-3.8439
ADF(5)	-6.6049	-4.9078	-5.1915	-2.3016	-3.6638
95% critical value	-2.8870	-2.8870	-2.8870	-2.8870	-2.8870

The lag length used in conducting the cointegration test was based on several criteria commonly used in many empirical studies such as AIC and SBC. We also found that when choosing the optimal order of the VAR, there is a conflicting VAR order on the basis of AIC and SBC criteria. AIC chooses VAR (4) whilst SBC chooses VAR (2). In order not to exhaust the degree of freedom we will choose VAR (2).

Table 3: Order of the VAR Model[8]

Order of VAR	Type of Tests	
	AIC	SBC
6	1627.8	1423.3
5	1630.9	1460.5
4	1633.4	1497.1
3	1594.1	1491.8
2	1586.7	1518.5
1	1467.0	1433.0
0	1305.5	1305.5

After confirming the data suitability by unit root test and lag order, we continue to examine whether there exists long-run equilibrium among the variables by first conducting the EG cointegration test and followed by JJ cointegration test. Under EG cointegration test, we need to test the residuals either they are stationary or not using this hypothesis:

[8] Please refer to Appendix 2 for detailed result.

H_0: The residuals are non-stationary (unit root)

Based on the ADF test in Table 4, the residuals are found to be stationary (we reject the null hypothesis), thus conclude that there is one cointegration vector amongst variables tested. This is probably the limitation of EG cointegration test, which assume only one cointegration from the residuals analysis.

Table 4: Cointegration Test Engle Granger: testing Unit Root on Residuals[9]

Test	Intercept with no trend	Intercept with trend
DF	-4.1626	-4.1440
ADF(1)	-4.9936	--4.9709
ADF(2)	-6.7227	-6.6919
ADF(3)	-7.3853	-7.3510
ADF(4)	-6.0750	-6.0444
ADF(5)	-6.6393	-6.6057
95% critical value	-2.8870	-3.4497

Another cointegration test JJ, on the other hand bypass this limitation. The results of the Johansen–Juselius likelihood cointegration test shows that the existence of long run co-movement amongst variables (GDP, M3, IPI, IBS and INTRATE). We found there are two (2) cointegrating vectors at 95% significance level on the basis of Maximal Eigenvalue and Trace Stochastic Test (Table 5). An evidence of cointegration implies that the relationship among the variables is not spurious, evidentially there is a theoretical relationship among the variables and that they are in equilibrium in the long run (Masih et al., 2009). In another words, even though these variables may diverge in short-run, in long run however they will converge consequently with at least one direction of causation in the Granger sense, either unidirectional or bi-directional causality.

[9] For detailed result please refer to Appendix 3A.

Table 5: Johansen's test for the number of cointegrating vectors (VAR 2)

Null	Alternative	Maximum Eigenvalue	Trace Stochastic
r=0	r=1	144.8261*	233.9713*
r<=1	r=2	48.8149*	89.1452*
r<=2	r=3	24.6991	40.3304
r<=3	r=4	10.0893	15.6313
r<=4	r=5	5.5420	5.5420

List of variables in the cointegrating vector: (LGGDP, LGIPI, LGM3, LGIBS, INTRATE)
* denotes significant at 5% significance level respectively,
r indicates the number cointegrating vectors present.

In Table 5, both the Max-Eigen and Trace statistics gave similar conclusion; there are two cointegrating equations as shown by the value of statistics. Under both cases, we will reject the null hyphoteses (r<=1) and accept the alternative (r=2).

Conintegration only tell us in the long run these variables will move back to equilibrium but unable to test the consistency of these variables with the theory. However LRSM is capable of testing this. According to Masih et al. (2009), to make the coefficients of the cointegrating vector consistent with the theory, firstly, there is a need to impose a normalizing restriction of unity on selected variable at the *'exactly-identifying'* stage. Subsequently, we experimenting another variable at the *'over-identifying'* stage. In this study we have two cointegrating vectors, thus two dependent variables are chosen for each vector. For the first variable, LGGDP is selected as this is our focus variable, while LGIPI is used for second vector since LGIPI could also be used as growth indicator. We impose a normalizing restriction of unity on the coefficient of LGGDP (Vector 1) and LGIPI (Vector 2).

We found in Table 6, all the coefficients of the cointegrating vector are significant[10]. We could not reject LGIBS in triple occasions. Firstly we test the coefficient of LGIBS on CV1, then CV2 and lastly on both CV1 and CV2 by applying this hypothesis[11];

H_0: coefficient of LGIBS = 0

Confirmed with our prediction, when we imposed an *over-identifying* restriction of zero on the coefficient of Islamic bank financing, we were able to reject our null hyphothesis, thus LGIBS variable is supported by theory. We also test the other two variables M3 and INTRATE[12], and able to reject the joint restriction of zero in both vectors, thus all these variables entered the cointegrating relationships significantly. After testing all the variables, the final cointegrating vectors remain as CV1 and CV2.

Table 6: LRSM (exact-identifying and over-identifying test)

	CV1 **Exact**	**CV2** **Exact**	**Vector 3** **Over CV1**	**Vector 4** **Over CV2**	**Vector 5** **Over CV1 and CV2**
LGGDP	1.0000 (NONE)	0.00 NONE	1.0000 (NONE)	0.00 NONE	1.0000 (NONE)
LGIPI	0.00 NONE	1.0000 (NONE)	0.00 NONE	1.0000 (NONE)	
LGM3	-.94023 (.18737)	-2.5569 (.54574)	-.99255 (.37011)	-2.7127 (1.2148)	
LGIBS	-.24386 (.056922)	-.80536 (.17482)	0.00 NONE	0.00 NONE	0.00 NONE
INTRATE	-.026521 (.0089028)	-0.037424 (.027270)	.0059742 (.015713)	.070814 (.051329)	
TREND	.0071569 (.0019917)	0.030235 (.0058338)	.00418 .0030629	-020269 (.010048)	
Chi-Square (prob value)	-	**-**	**0.009 (Reject Null)**	**0.011 (Reject Null)**	**0.034 (Reject Null)**

[10] When the value of coefficient/standard error is more than 2, the variable has significant effect on GDP/IPI

[11] For detailed result refer to Appendix 4, pg 47-48

[12] Please refer to Appendix 4, Pg 49-50.

As mentioned earlier, cointegration does not tell us which variable is leading or lagging. This is when the VECM plays its important role in determining whether the variable is exogenous or endogenous. There are 3 vital information could be extracted from VECM. One is to specify whether the variable is exogenous or endogenous, secondly it can tell us the significant of the variables in the short run and long run and lastly, the speed of the variables going back to equilibrium in the long run. The coefficient of the lagged error-correction term is a short-run adjustment coefficient representing the proportion by which the long-run disequilibrium in the dependent variable is being corrected in each period. For example in the case of dLGGDP as dependent variable, the cointegration process will take about 4 months to arrive at equilibrium (Table 7).

Table 7: VECM Estimates

VARIABLES	**∆LGGDP**	**∆LGIPI**	**∆LGIBS**	**∆LGM3**	**∆INTRATE**
∆LGGDP(1)	.93731*	1.15322	.23864	-.32230*	1.1794
∆LGIPI(1)	-.022250*	-.42014*	.036036*	-.039933*	-.17782
∆LGM3(1)	-.063045	-.15071*	-.10904	.048941	-.33328
∆LGIBS(1)	.042281	-.46129	.16531	.092035	-.49790
∆INTRATE(1)	-0018696	0.020806	.2023E-3	-.6100E-3	.24034
ECM(-1)	-.24921*	.31657	.09804	.0074682	.31552
Time taken to go back to equilibrium	**4.2 months**	**3.2 months**	**10.2 months**	**135 months**	**3.2 months**
ECM(-2)	0.063819*	-.33767*	-.084130*	.071664*	.10125
Time taken to go back to equilibrium	**16.7 months**	**3 months**	**12.5 months**	**14 months**	**10 months**
CV1(GDP)	**ENDO**	**-**	**EXO**	**EXO**	**EXO**
CV2(IPI)	**-**	**ENDO**	**ENDO**	**ENDO**	**EXO**

Looking at Table 7 especially on the error correction coefficients, for CV1 (GDP) we find that the GDP is endogenous and other variables IBS, M3 and INTRATE variables are exogenous. Basically from this result we could infer IBS leads GDP, and consistent with supply leading theory. However, when we look at the second CV2 (IPI), both IPI and and IBS are endogenous and for this reason we need the next step VDC to tell us the relative endogenous and exogenous variables in the long run.

In Generalised Variance Decomposition test, the relative exogeneity or endogeneity of a variable can be determined by the proportion of the variance explained by its own past. The variable that is explained mostly by its own shocks (and not by others) is deemed to be the most exogenous of all (Masih et al., 2009). For this study we use the forecast horizon 25 and 40 to determine the relativity of these variables as in Table 8.

In Generalised VDCs, however the total amount for all variance for each variable of interest is not proportionate to 1, thus we must weigh these variables proportionately to get a total of 100%. The transformation can be deduced as in Table 8 below.

Table 8: Generalized Forecast Error Variance Decomposition 25th and 40th month

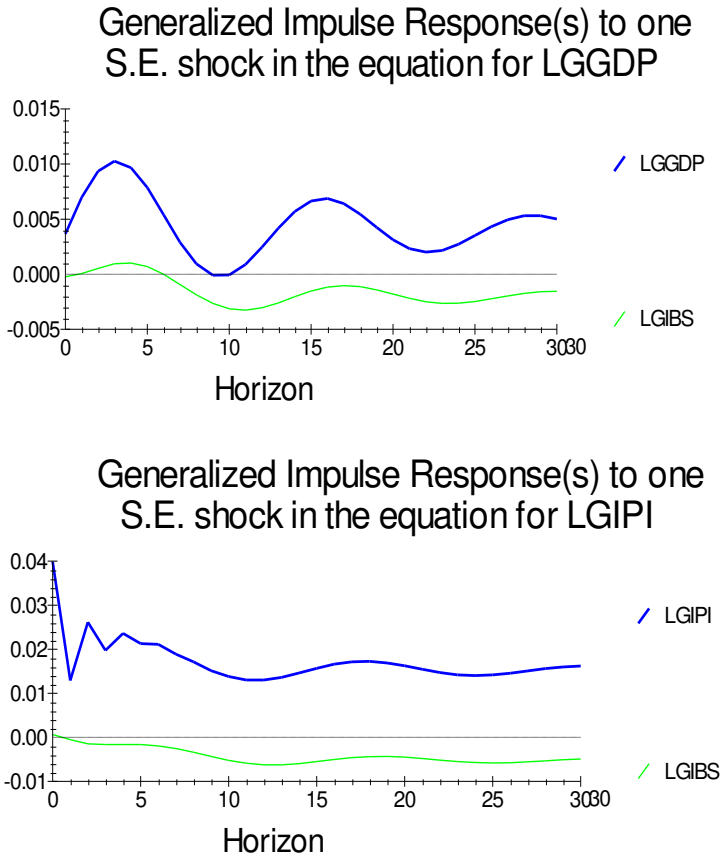
VARIABLES	MONTH / (RANK)	ΔLGGDP	ΔLGIPI	ΔLGM3	ΔLGBIS	ΔINTRATE	TOTAL
ΔLGGDP	25 (4)	**24.46237**	47.63022	15.78541	1.395675	10.72633	100
(%)	40 (4)	**22.89217**	47.88938	16.66048	1.453492	11.10448	100
ΔLGIPI	25 (3)	17.71145	**51.73463**	22.24906	4.751361	3.553504	100
(%)	40 (3)	17.21891	**49.12712**	24.62256	5.520494	3.510921	100
ΔLGM3	25 (5)	17.48094	54.49085	**24.27342**	3.334482	0.420303	100
(%)	40 (5)	17.42957	57.47807	**21.30895**	3.514357	0.26906	100
ΔLGBIS	25 (2)	14.05737	7.36391	9.216155	**69.07263**	0.289944	100
(%)	40 (1)	1.56783	9.228524	10.65182	**78.18163**	0.370197	100
ΔINTRATE	25 (1)	6.698922	11.54456	1.341074	2.441523	**77.97392**	100
(%)	40 (2)	6.681779	11.85386	1.395162	2.556695	**77.51251**	100

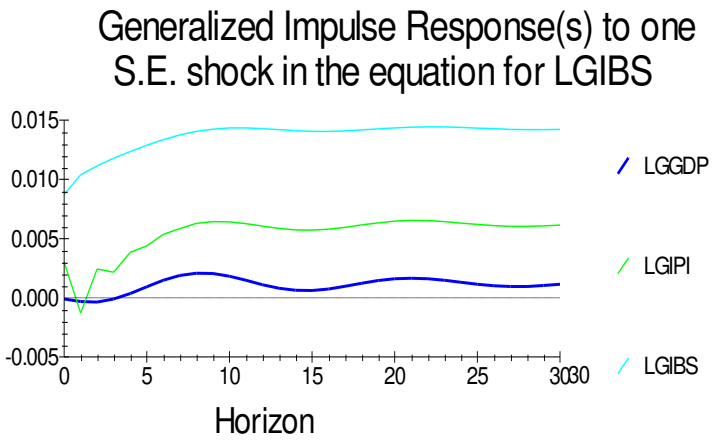
Based on Table 8, we could conclude on 25th month our focus variable IBS (69%) is more exogenous as compared to IPI and GDP. As the period goes on as in the 40th month, the IBS variance increased. In 40th month IBS became the most exogenous variable, thus

consistent with the result in VECM. It is clear that IBS is the most influential variable as compared the other 2 growth variables (GDP and IPI), IBS is leading rather than lagging and confirm the *supply-leading* theory.

In the next step we applied the generalized IRF in Figure 1. Figure 1 displays the IRF for one standard error shock to the equation for GDP, then IPI and lastly IBS. Generally, one standard error shock to GDP and IPI have a small impact on IBS. The graphs also show us, there is more impact on IPI than GDP, when we shock IBS.

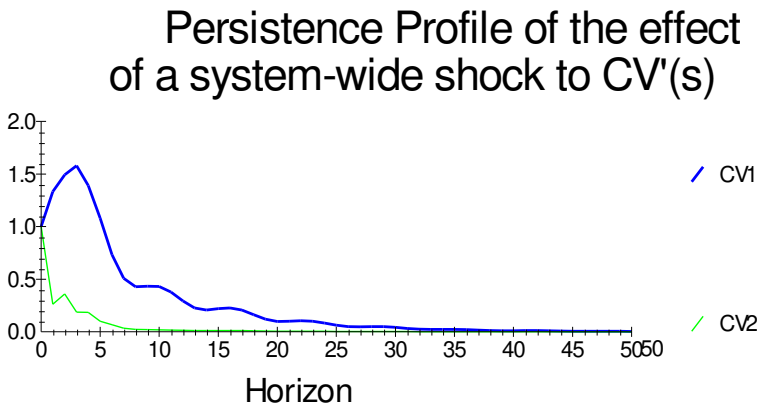
Figure 1: IRF





Finally, an application of the persistence profile analysis indicates that if the whole CV1 is shock, it returns to the equilibrium in 30 months. CV2 on the other hand, returns to the equilibrium quicker by 20 months (7 months). This result implied both vectors have a tendency to converge to their long term equilibrium.

Figure 2: PP



5.0 CONCLUSION

In this study we want to determine whether or not there is any Granger causality between financial sectors (measured by Islamic Banks financing) and growth (GDP). The direction of this causality is important as this will represent different policy implications for developing countries like Malaysia. For example in the case of supply-leading, policies should aim to financial sector liberalization; whereas in the case of demand-following, more emphasis should be placed on other growth-enhancing policies. Previous studies are inconclusive as to the directions of this causality.

In our study, VECM, Variance Decomposition and Impulse Response tend to confirm with our prediction that indicate that "financial sectors" leads "economic growth" and prove supply-leading rather than demand-following. This conclusion is supported by both cointegrating vectors (CV1, GDP) and (CV2, IPI), as the IBS are proved to be more exogenous than these two variables (GDP and IPI). Our findings are consistent with Masih et al. (1999) and Patrick (1966) who concluded that a supply-leading condition is likely to prevail at the early stage of economic development, while a demand-following condition is likely to prevail at the later stage of economic development. This is true to the scenario of Islamic banking in Malaysia as it has not yet reached its maturity period and still at its infancy. It would be interesting to investigate as how the effect of conventional financing to Malaysian growth.

The major implication from the findings could give a big indicator what Bank Negara is undertaking in ensuring Malaysia to be the hub of Islamic finance is paid off and strongly supported by the findings. Recently, Bank Negara has issued new Islamic Banking and Family Takaful Licences to enhance the financial sector to the next level. Another

infrastructure development that is taking shape in the international Islamic financial system is the establishment of the International Islamic Liquidity Management Corporation (IILM) launched in October 2010. Its main task is to issue short-term multi-currency liquidity instruments to facilitate the cross-border liquidity management between financial centres and at the same time enhance the financial inter-linkages[13]. Consequently, all this proactive actions taken by Bank Negara could stimulate economic growth in the future as supported by our findings.

13 Keynote Address by Dr. Zeti Akhtar Aziz at the Launch of Bloomberg's Enhanced Islamic Finance Platform, extracted from www.bnm.gov.my at 5 May 2011.

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