The Formation of Deposit Rates in Malaysia : Analysis of Islamic and Conventional Finances[1]

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【Abstract】

This paper has analyzed the formation of conventional interest rates and Islamic rates of return in Malaysian deposit market. Conventional interest rates and Islamic rates of return on all maturities co-move in the long-run equilibrium. Islamic rates of return propel over conventional interest rates on three-, six-, and 12-month maturities. This result is different from the results of Chong and Liu (2009), and Cevik and Charap (2011), which state that conventional interest rates unilaterally Granger-cause Islamic rates of return. Chong and Liu (2009) used a sample covering the period from April 1995 to April 2004, and Cevik and Charap (2011) used a sample period from January 1997 to August 2010. The sample period of this paper is from May 16, 2005 to October 17, 2014. But the result is consistent with Ito (2013), which shows that Islamic rates of return propelled conventional interest rates on three-, six-, and 12-month maturities between May 16, 2005 and January 12, 2012.The conventional and Islamic deposit markets are competitive in Malaysia, where Islamic banking has a strong influence over conventional banking. This is consistent with the fact that the share of Islamic deposits in Malaysia rose from 5% to 25% between 1999 and 2015.

Keywords: Conventional Finance, Formation of Deposit Rate, Islamic Finance, Malaysia

[1] The original version of this paper was published as Ito (2017).

1. Introduction

In Malaysia, the share of Islamic deposits in the deposit market has grown since 2000, especially since 2005, and has grown rapidly, reaching about 25% at the end of 2014 from 5% in 1999, as shown in Figure 1. The philosophies and principles of Islamic banking are based on Shariah, which protects Islamic communities and societies from activities that are forbidden in Islam. Shariah is also intended to encourage companies to engage in business activities that are acceptable and consistent with Islamic principles. Islamic banking differs from conventional banking in that interest (riba) is prohibited. Islamic banks use rates of return in place of interest rates. This paper analyzes co-movement of conventional interest rates and Islamic rates of return to investigate the formation of conventional interest rates and Islamic rates of return in the Malaysian deposit market by extending the sample period from Ito (2013).

Chong and Liu (2009), Cevik and Charap (2011), Ito (2003), Ergec and Arslan (2013), and Sarac and Zeren (2015) have analyzed the relationship between conventional interest rates and Islamic rates of return in the deposit market. Chong and Liu (2009) analyzed the co-movement and transmission of conventional interest rates and Islamic rates of return in Malaysia. They concluded that co-movement is observed and that conventional interest rates influence Islamic rates of return. They also concluded that Islamic banking is not very different from conventional banking.

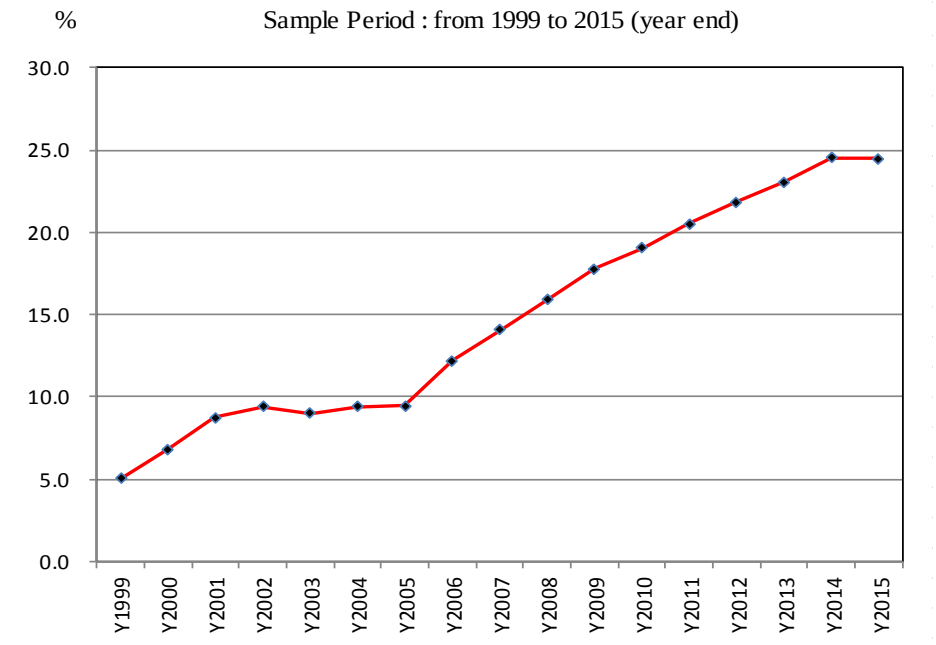

Figure 1 The share of Islamic deposits in total deposits

Note:
Sample Period : from 1999 to 2015 (year end)
Source : Bank Negara Malaysia Monthly Statistical Bulletin

Cevik and Charap (2011) analyzed the co-movement and transmission of conventional interest rates and Islamic rates of return in Malaysia and Turkey using monthly data. They concluded that the rates of conventional and Islamic deposits co-move and that conventional interest rates influence Islamic rates of return. Ito (2013) concluded that conventional interest rates and Islamic rates of return co-move in the Malaysian deposit market, and that Islamic rates of return propel the conventional interest rates of three-, six-, and 12-month maturities.

Ergec and Arslan (2013) investigated and analyzed the impact of interest rate shock upon deposits and loans held by conventional and Islamic banks and found that Islamic banks in Turkey are manifestly influenced by interest rates. Sarac and Zeren (2015) econometrically investigated the long-term relationship between conventional banks' (CB) term-deposit rates (TDRs) and participation banks' (PB) TDR in Turkey. Their findings show that the TDRs of three of four PBs are significantly cointegrated with those of CBs. In addition, permanent causality is found from CBs to all PBs.

This paper makes a contribution to the literature. This paper analyzes the co-movement and transmission of conventional interest rates and Islamic rates of return in a sample from May 16, 2005 to October 17, 2014. Ito (2013) used the daily data of a sample covering the period from May 16, 2005 to January 12, 2012. The extended period from Ito (2013) is almost two years and a half. Chong and Liu (2009) used the monthly data of a sample covering the period from April 1995 to April 2004, and Cevik and Charap (2011) used the monthly data of a sample covering the period from January 1997 to August 2010.

The remainder of this paper is structured as follows. Section 2 describes the data and provides summary statistics. Section 3 discusses methodology. Section 4 presents the results. Section 5 concludes.

2. Data

Conventional interest rates and Islamic rates of return in the deposit market are used. The maturities of deposits are set at three, six, and 12 months. The data are daily. The sample period runs from May 16, 2005 to October 17, 2014. The conventional interest rates and Islamic rates of return on three-, six-, and 12-month maturities are provided by Bloomberg. The movement of the six-month Islamic rate of return is shown in Figure 2, and the descriptive statistics are provided in Table 2.

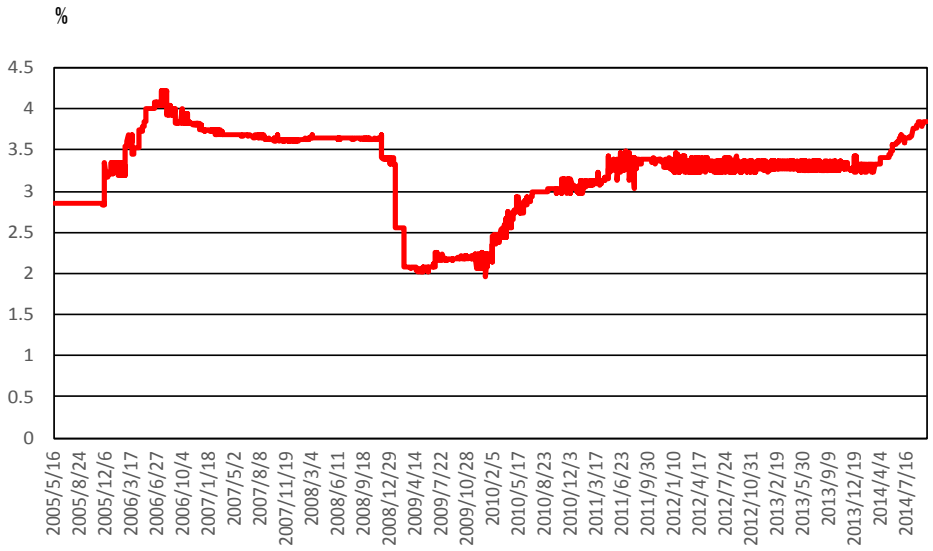

Figure 2 Movement of six month Islamic rate of return
Note:
Sample period is from May 16, 2005 to October 17, 2014.
Data source is Bloomberg.

Table 1

Descriptive statistics of data for analysis

Variable	Average	SD	Min	Max	Median
IS3M	3.186	0.481	1.980	3.950	3.250
IS6M	3.245	0.489	1.960	4.230	3.335
IS12M	3.339	0.508	1.930	4.430	3.430
CO3M	3.159	0.468	1.990	3.850	3.210
CO6M	3.207	0.468	2.020	3.900	3.260
CO12M	3.292	0.488	2.000	4.100	3.350

Notes:
Sample period is from May 16, 2005 to October 17, 2014.
IS = Islamic Deposit, CO = Conventional Deposit

3. Methodology[2]

3.1. Unit Root Test

Because empirical analysis from the mid-1980s through the mid-1990s shows that such data as interest rates, foreign exchanges, and stocks are non-stationary, it is necessary to check whether the data used in this paper contain unit roots. The Augmented Dickey-Fuller (ADF) test and the Kwiatowski-Phillips-Schmidt-Shin (KPSS) test are used[3]. The ADF defines the null hypothesis as “unit roots exist” and the alternative hypothesis as “unit roots do not exist.”

[2] The same methods as in Ito (2013) are used.
[3] See Dickey and Fuller (1979), Dickey and Fuller (1981), and Kwiatkowski et al. (1992).

Fuller (1976) provides a table for the ADF test. The KPSS test defines the null hypothesis as "unit roots do not exist" and the alternative hypothesis as "unit roots exist." First, the original data are checked to verify whether they contain unit roots. Next, the data with first difference are analyzed to determine whether they have unit roots to confirm that they are *I* (1) process.

3.2. Engle-Granger Cointegration Test

After confirming that all data are non-stationary *I* (1) processes in section 3.1, a cointegration framework is presented to analyze the relationship between the conventional interest rate and the Islamic rate of return. Equation (1) is estimated by OLS to determine whether the residual contains unit roots.

$$ISD_t = \alpha + \beta\, COD_t + u_t \qquad (1)$$

ISD_t = Islamic rate of return

COD_t = conventional interest rate

The cointegration vector, β in equation (1), is checked using the dynamic OLS method developed by Stock and Watson (1993). Equation (2) is used to test whether β = 1 can be rejected. ΔCOD_{t-i} is the lead and lag variables of conventional interest rate[4]. If β = 1 cannot be rejected, the Islamic rate of return changes to the same degree as the conventional interest rate. The test of the cointegration vector is only conducted on a pair of samples when they are in a cointegration relationship.

$$ISD_t = \alpha + \beta COD_t + \sum_{i=-p}^{p} b_i \Delta COD_{t-i} + u_t \qquad (2)$$

Analyses of the pair-wise relationship between the conventional interest rate and the Islamic rate of return on three-, six- and 12-month maturities are conducted. The co-movement of the Islamic rate of return with the conventional interest rate is investigated using the cointegration test. Whether the conventional interest rate and the Islamic rate of return are in a one-to-one relationship is tested using the cointegration vector test. An interpretation of the results divided into three cases can be made in the following way.

Case	cointegration	cointegration vector
Ⅰ	no	--
Ⅱ	yes	β＝1 cannot be denied
Ⅲ	yes	β＝1 can be denied

[4] As for the number of lead and lag terms, 12 is used. Hirayama and Kasuya (1996) provide empirical analysis using Rats procedure SWDYNAMIC.PRG.

Ⅰ The conventional interest rate does not co-move with the Islamic rate of return. The deposit market is segmented into conventional and Islamic banking. There is no competition between them.

Ⅱ The conventional interest rate co-moves with the Islamic rate of return. The conventional interest rate is in a one-to-one relationship with the Islamic rate of return. The competition between them is keen.

Ⅲ The conventional interest rate co-moves with the Islamic rate of return. The conventional interest rate is not in a one-to-one relationship with the Islamic rate of return. The competition between them is observed.

3.3. Granger Causality Test

With regard to the variables ISD_t (Islamic rate of return) and COD_t (conventional interest rate), the Granger causality test checks whether ISD_t affects COD_t, COD_t affects ISD_t, or ISD_t and COD_t affect each other mutually in a time series model. The original data are usually transformed into a change ratio to avoid spurious regression, but using these data causes errors. In this paper, the null hypothesis H_0 regarding the influence of COD_t on ISD_t and the influence of ISD_t on COD_t is tested using the original data of conventional interest rate and the Islamic rate of return pair-wise in the same maturity. In this method proposed by Toda and Yamamoto (1995), trend term t and $p + 1$ (original lag plus one) are added for the estimation. Original lag length is decided by the AIC standard.

$$ISD_t = u_0 + u_t + \sum_{i=1}^{p+1} \alpha_i ISD_{t-i} + \sum_{i=1}^{p+1} \beta_i COD_{t-i} + u_t \qquad (3)$$

$$H_0: \beta_1 = \beta_2 = \cdots \beta_p = 0$$

$$H_1: Either\ \beta_i \neq 0\ \ (i = 1,2,\cdots,p)$$

$$COD_t = u_0 + u_t + \sum_{i=1}^{p+1} \alpha_i ISD_{t-i} + \sum_{i=1}^{p+1} \beta_i COD_{t-i} + u_t \qquad (4)$$

$$H_0: \gamma_1 = \gamma_2 = \cdots \gamma_p = 0$$

$$H_1: Either\ \gamma_i \neq 0\ \ (i = 1,2,\cdots,p)$$

The F test is conducted by estimating (3) and (4) through OLS and summing the squared error. If the null hypothesis of H_0 in equation (3) is rejected, COD_t is considered to explain ISD_t. In other words, the conventional interest rate Granger-causes the Islamic rate of return. If the null hypothesis of H_0 in the equation (4) is rejected, ISD_t is considered to explain COD_t. In other words, the Islamic rate of return Granger-causes the conventional interest rate.

4. Results

4.1. Unit Root Test

First, ADF and KPSS tests are conducted on the original series. The results do not eliminate the doubt that the original data have unit roots because both tests show non-stationarity. The results are shown in Table 2 and Table 3.

Next, ADF and KPSS tests are conducted for the data with a first difference. The results show that all variables are stationary. Even though some tests of trend stationarity show significance at the 5% level, none of them are significant at the 1% level. Thus it is appropriate to think that all of the variables used for the analysis are non-stationary I (1) variables and to judge that non-stationary time series can be used. The results are shown in Tables 4 and 5.

Table 2

ADF unit root test (Original Series)

Variable	Without Trend	With Trend
IS3M	0.703	−0.926
IS6M	0.560	−1.184
IS12M	0.417	−1.430
CO3M	0.576	−1.162
CO6M	0.575	−1.206
CO12M	0.642	−1.165

Notes:

* indicates significance at the 5% level.

5% critical values are −2.86 (without trend) and −3.41 (with trend).

IS = Islamic Deposit, CO = Conventional Deposit

Table 3

KPSS unit root test (Original Series)

Variable	Lag = 4		Lag = 12	
	Level Stationary	Trend Stationary	Level Stationary	Trend Stationary
IS3M	5.146*	4.716*	1.988*	1.823*
IS6M	4.957*	4.661*	1.918*	1.804*
IS12M	4.722*	4.348*	1.828*	1.684*
CO3M	4.725*	4.551*	1.827*	1.760*
CO6M	5.067*	4.688*	1.961*	1.815*
CO12M	5.008*	4.509*	1.941*	1.748*

Notes:

* indicates significance at the 5% level.

5% critical values are 0.463 (level stationary) and 0.146 (trend stationary).

IS = Islamic Deposit, CO = Conventional Deposit

Table 4

ADF unit root test (first difference series)

Variable	Without Trend	With Trend
ΔIS3M	−33.895*	−33.849*
ΔIS6M	−33.259*	−33.209*
ΔIS12M	−34.927*	−34.870*
ΔCO3M	−13.628*	−15.642*
ΔCO6M	−35.656*	−35.597*
ΔCO12M	−26.396*	−26.380*

Notes:

* indicates significance at the 5% level.

5% critical values are −2.86 (without trend) and −3.41 (with trend).

IS = Islamic Deposit, CO = Conventional Deposit

Table 5

KPSS unit root test (first differenced series)

Variable	Lag = 4		Lag = 12	
	Level Stationary	Trend Stationary	Level Stationary	Trend Stationary
ΔIS3M	0.156	0.143	0.216	0.199*
ΔIS6M	0.115	0.104	0.162	0.146*
ΔIS12M	0.079	0.076	0.125	0.121
ΔCO3M	0.120	0.112	0.160	0.149*
ΔCO6M	0.091	0.084	0.146	0.135
ΔCO12M	0.067	0.063	0.116	0.109

Notes:

* indicates significance at the 5% level.

5% critical values are 0.463 (level stationary) and 0.146 (trend stationary).

1% critical values are 0.739 (level stationary) and 0.216 (trend stationary).

Level Stationary (Lag=4) is not significant at the 1 % level.

IS = Islamic Deposit, CO = Conventional Deposit

4.2. Engle-Granger Cointegration Test

Pair-wise analyses on the conventional interest rate and Islamic rate of return on one-, three-, six-, and 12-month maturities are conducted because these data were confirmed to be *I* (1) . Conventional interest rates and Islamic rates of return on all maturities co-move in the long-run equilibrium. The results are shown in Table 6.

Table 6

Cointegration test

Variable	Test Statistics
IS3M, CO3M	−11.405*
IS6M, CO6M	−8.429*
IS12M, CO12M	−7.523*

Notes:

* indicates significance at the 5% level.

5% critical value is −3.7809 from MacKinnon (1991).

10% critical value is −3.4959 from MacKinnon (1991).

IS = Islamic Deposit, CO = Conventional Deposit

A one-to-one relationship is not confirmed in each maturity. The size of β (the impact of the conventional interest rate on the Islamic rate of return) is larger than 1. This indicates that Islamic rates of return are higher than conventional interest rates in the long-run equilibrium. The results are reported in Table 7.

Table 7

Cointegration vector test

Variable	β	Modified SE	Modified t Value
IS3M, CO3M	1.028	0.009	3.111
IS6M, CO6M	1.044	0.010	4.400
IS12M, CO12M	1.035	0.014	2.500

Notes:

* means that $\beta = 1$ cannot be rejected since modified t value is smaller than 5% critical value (1.96).

IS = Islamic Deposit, CO = Conventional Deposit

4.3. Granger Causality Test

Pair-wise Granger causality tests are conducted on conventional interest rates and Islamic rates of return. Mutual causalities between them are confirmed. When these causalities are compared, the size of the causality from the Islamic rate of return to the conventional interest rate is higher than that from the conventional interest rate to the Islamic rate of return. The results are reported in Table 8.

Table 8

Granger causality test

Variable		Variable	
Islamic to Conventional		Convetional to Islamic	
IS3M → CO3M	40.848*	CO3M → IS3M	11.049*
IS6M → CO6M	12.369*	CO6M → IS6M	11.605*
IS12M → CO12M	13.560*	CO12M → IS12M	4.542*

* indicates significance at 1 % level.

As for the number of lags, one ia added to AIC selection.

IS = Islamic Deposit, CO = Conventional Deposit

5. Concluding Remarks

This paper has analyzed the co-movement and transmission of conventional interest rates and Islamic rates of return. Conventional interest rates and Islamic rates of return on all maturities co-move in the long-run equilibrium. Islamic rates of return propel over conventional interest rates on three-, six-, and 12-month maturities. This result is different from the results of Chong and Liu (2009), and Cevik and Charap (2011), which state that conventional interest rates unilaterally Granger-cause Islamic rates of return. Chong and Liu (2009) used a sample covering the period from April 1995 to April 2004, and Cevik and Charap (2011) used a sample period from January 1997 to August 2010. The sample period of this paper is from May 16, 2005 to October 17, 2014. But the result is consistent with Ito (2013), which shows that Islamic rates of return propelled conventional interest rates on three-, six-, and 12-month maturities between May 16, 2005 and January 12, 2012.

The conventional and Islamic deposit markets are competitive in Malaysia, where Islamic banking has a strong influence over conventional banking. This is consistent with the fact that the share of Islamic deposits in Malaysia rose from 5% to 24.5% between 1999 and 2014. As the Association of Islamic Banking Institutions Malaysia (AIBIM) states, the ultimate objective of the Malaysian model of an Islamic financial system is to operate in parallel with the conventional financial system, coexisting and competing with conventional banking in Malaysia. At the same time, Islamic banking is exerting increasing influence on the formation of short-term interest rates. So far, the Malaysian government's policy to promote Islamic finance in the country has been successful.

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