

The Stability of Deposits in the Interest-Based and Interest-Free Banking Systems in Malaysia

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ABSTRACT

This study empirically examines the stability and the main factors that have influenced the deposits in the Malaysian banking system. A structural model of the Malaysian money deposits applied to annual data for the 1983–2001 periods was designed. This structural model consists of five behavioural equations and three identities. A structural model functional form is used and estimated using the ordinary least squares in the log linear form. The behavioural equations are used to estimate the influences of various factors on the conventional demand deposits, conventional time deposits, Islamic demand deposits, Islamic time deposits, and Islamic investment deposits. The implications of the study are that the increase in real gross domestic product, interest rate stability, and an increase in the profit-share for savings and investments are important for maintaining and enhancing the development of Malaysian money deposits. The results show that all the models (conventional and Islamic banks deposits) are stable; however, Islamic demand deposits and Islamic time deposits are more stable than conventional demand deposits and conventional time deposits, because their Chow tests values are smaller than those of conventional deposits. The findings of this study suggests that as shariah compliant deposits are more stable than their conventional equivalents, then this makes a run on deposits less likely, reducing the potential amount of capital adequacy cover needed.

Key Words: Conventional demand deposits; Conventional time deposits; Islamic demand deposits; Islamic time deposits; Islamic investment deposits

INTRODUCTION

Large numbers of scholars claim that Islamic banking is more stable than conventional banking. However, almost all these studies are theoretical. Our search of the literature shows that the studies by Darrat (1988) and Hassan (1996) attempt to empirically verify the superiority of Islamic banking in terms of deposit stability using monetary aggregates (M1 and M2). In particular, Darrat (1988) claims the superiority of Islamic banking in Tunisia, a country without a real history of Islamic banking. Therefore, the purpose of this study is to provide additional empirical analysis regarding the determinants and volatility of Islamic bank deposits using data on demand and time deposits in Malaysia.

The renewed interest in Islamic economics, especially Islamic interest-free banking. Iran and Sudan, has instituted Islamic banking systems, and while many other countries have established a mixed/dual banking system where Islamic banks operate side by side with the conventional banks. Following the latter course the first Islamic bank in Malaysia started operating in July 1983. The blue print of the modern Islamic banking system came in 1983 with the introduction and enforcement of two new acts known as Islamic Banking Act and the Government Investment Act. However, in Malaysia the demand for Islamic banking dates from the establishment of Lembaga Tabung Haji in 1969, now known as Tabung Haji. Tabung Haji collects and invests the savings of those who want to perform pilgrimage to Makkah in accordance to Islamic law (*Sharia*), and disburses the funds to pay for airfares and accommodation.

Following a decade of successful functioning and performance of Islamic banks, on March 4th 1993, the Malaysian government introduced an interest-free banking scheme (*Skim Perbankan Tanpa Faedah*). Under this scheme, all conventional banks were asked to participate and offer Islamic finance by opening Islamic counters that would exist side by side with conventional counters.

Islamic banks and conventional banks with Islamic counters or branches in Malaysia offer deposit facilities that rely on profit sharing instead of interest. The bank offers demand and savings deposits under the concept of guaranteed custody (*Al-Wadiah*) and investment deposits under the concepts of profit sharing (*Al-Mudharabah*). Here, the return on demand and saving deposits depends upon the banks' own discretion based on the profit that they declare. However, the differences between the investment deposits in Islamic banks and fixed deposits in conventional banks is that these types of accounts are not considered as liabilities or

debt, but as participatory accounts. Here the banks invest their client's money, with their general or specific consent, depending on the account contract, in different projects. After that, on the basis of their agreement the profit shares are distributed between the bank and its customers using a pre-agreed ratio.

In this study, we use the ordinary least square (OLS) econometric method of regression to estimate the main factors influencing Islamic and conventional bank deposits. Three types of tests are used: the Chow test for the structural change; the value of R^2 is used to measure the correlation of the variables; and the statistic of variances to measure the velocity of deposits.

REVIEW OF PREVIOUS RESEARCH LITERATURE

Since the establishment of Islamic banking a considerable amount of theoretical literature has been published on its operations and methods of financing. (for example, Khan 1985 and Haron 1995). However, only a few empirical studies have been undertaken of the modelling of monetary stability under an Islamic financial system. (Mustaq and Khan 1990); (Yousafi Abizadeh and McCormick 1997). All these studies have attempted to prove that Islamic monetary instruments are as stable as interest-based instruments.

The most comprehensive study of monetary stability under an Islamic banking system was that undertaken by Hassan (1996). He studied the behaviour of the demand for money in 15 Islamic countries and concluded that interest-free money demand deposits are more stable than interest-bearing deposits. The only previous work in this field in Malaysia was a study by Kaleem (2000), who developed a model to test the monetary stability under the country's dual banking system. However, this study used monetary variables rather than bank deposit data, and the data run was more limited than for this present study.

This empirical study is the first to analyse the relative stability of the Islamic and conventional bank deposits in Malaysia. Previous studies such as that by Kaleem have attempted to provide proof of the relative stability of the banking systems, but this could not be determined by a comparison between the performance of M1 and M2 definitions of money supply.

The model specification in this study follows the model used by Darrat (1988) and Hassan (1996). The later concluded that interest-free

money [MNI (M1)] is more stable than interest-bearing money [MI (M2)]. In addition, according to Darrat, interest-free money (MNI) is stable; however, interest-based money is not (MI).

This model has been chosen because the data used is available for conventional and Islamic banks deposits in Malaysia. Moreover, this model matches the objectives of this study, and allows for the testing of the hypotheses. Some modification has been made, however, so as to allow for and to conform to the Malaysian economic situation.

RESEARCH METHODOLOGY

An econometric model will be developed to explain the relationship between variables in the model. The equations include the Islamic banks profit-sharing deposits equation, the conventional interest-based deposits equation, the equation to test the correlation between profit-sharing and interest-based deposits and monetary base, the equation of the velocity of the profit-sharing and interest-based deposits.

This model will have five behavioural equations and three identities. The deposit model for the Islamic banks deposits explains the behavioural and the important factors that determine the deposits in the Malaysia Islamic banking system, and the model for the conventional banks' deposits also explain the behavioural and the important factors that determine the deposits in the conventional Malaysian banking system.

The correlation between profit-sharing and monetary base to test the correlation between profit-sharing deposits with monetary base, and the correlation between interest-based deposits and monetary base to test the correlation between interest-based deposits with monetary base, whereas, the velocity of the profit-sharing deposits and the interest-based deposits are to test which deposits are more stable by a comparison of both velocities of money.

In general, this research can be divided into three important parts: (i) Model development, this section will cover the model determination according to the economics theory. The framework that has been used includes an interest-based deposits model, a profit-sharing deposits model, and correlation between interest-based deposits with monetary base, correlation between profit-sharing money deposits with monetary base, a velocity of interest-based deposits model, and a velocity of profit-sharing deposits model as endogenous variables.

The interest-based and the profit-sharing deposits model are influenced by several explanatory variables, such as the real gross domestic

product, the nominal interest rate on money (RD_t and RT_t) for the conventional banking and the profit-sharing ratio ($SPSD_t$, $SPST_t$ and IPS_t) for the Islamic banking, the consumer price index, and the dependent variables lagged for one year. The model can be written as follows:

THE MODEL STRUCTURE FOR THE CONVENTIONAL BANK DEPOSITS

From the above explanation and discussion, the structural model for the conventional demand deposits and conventional time deposits are as follows:

$$DDC_t = a_0 + a_1GDRL_t + a_2RD_t + a_3CPI_t + a_4DDC_{t-1} + u_{1t} \quad (2)$$

$$TDC_t = b_0 + b_1GDRL_t + b_2RT_t + b_3CPI_t + b_4TDC_{t-1} + u_{2t} \quad (3)$$

The conventional identity equation

$$MDC_t = DDC_t + TDC_t \quad (4)$$

THE STRUCTURAL MODEL FOR ISLAMIC BANK DEPOSITS

The structural model for the Islamic bank's demand deposit, time deposits and investment deposits are as follows:

$$DDI_t = c_0 + c_1GDRL_t + c_2SPSD_t + c_3CPI_t + c_4DDI_{t-1} + u_{3t} \quad (5)$$

$$TDI_t = d_0 + d_1GDRL_t + d_2SPST_t + d_3CPI_t + d_4TDI_{t-1} + u_{4t} \quad (6)$$

$$IID_t = e_0 + e_1GDRL_t + e_2IPS_t + e_3CPI_t + e_4IID_{t-1} + u_{5t} \quad (7)$$

The Islamic identity equation

$$MDI_t = DDI_t + TDI_t + IID_t \quad (8)$$

Closing identity

$$MD_t = MDC_t + MDI_t \quad (9)$$

Where;

- M_t denotes is the nominal money demand at time t .
- L is a function relating money demand to real income, the nominal interest rate, and the general price level.
- GDP_t stands for is the gross domestic product at time t .
- R_t denotes is the nominal interest rate at time t
- P_t is the general price level at time t .
- P^e_t is the expected growth rate of inflation at time t .

Equation (9) is the closing identity equation, where the total deposits of money (MD_t) is equal to conventional deposits of money (MDC_t) plus Islamic deposits of money (MDI_t). $u_{1t}, u_{2t}, u_{3t}, u_{4t}, u_{5t}$ are the structural disturbance term at time t and μ the error term.

The assessment of the model will be carried out before the findings are applied for the purposes of policy implication in the Malaysian banking industry. In this study several statistical methods may be used. This study will use the *Root Means Square Error* (RMSE), and the *Root Means Squared Percentage Error* (RMSPE) method, and *Theil's test of inequality coefficient* (U statistics) will also be incorporated. In addition, a historical simulation will also be applied to both the models to check which model is more accurate and useful for the purposes of policy making.

THE EMPIRICAL RESULTS

The results, first, will explain the effect of real gross domestic product, interest rate, consumer price index, and the one-year lagged conventional demand deposits and conventional time deposits on the conventional demand deposits and the conventional time deposits.

The results, as shown in Table 1, show that the real gross domestic product is significant at the 10% level and 1% level for the conventional demand deposits and conventional time deposits respectively. This means, *ceteris paribus*, for every 1% increase in the real gross domestic product the conventional demand deposits and conventional time deposits will increase by 1.1753 and 1.7276 respectively. This result shows that the real gross domestic product plays an important role in determining the increase in demand and time deposits in conventional bank account. This also means that higher income leads to higher deposit in conventional bank.

TABLE 1. The regression analysis for the conventional demand deposits and conventional time deposits

Dependent	Independent variables						
Ln DDC _t	Intercept	ln GDRL _t	ln RD _t	ln CPI _t	ln DDC _{t-1}	R ²	Durbin h
	-4.7240 (-1.442)	1.1753 (1.812)*	0.2731 (1.865)*	-0.1245 (-0.620)	0.5291 (1.353)	0.9861	0.61
Ln TDC _t	-2.9527 (-1.501)	1.7276 (4.349)***	0.3498 (4.877)***	-0.1361 (-0.856)	0.1494 (0.478)	0.9941	1.34

The interest rate is significant at the 10% and 1% level to explain the conventional demand deposits and conventional time deposits. The responsiveness of demand deposits and time deposits with respect to interest rate is 0.2731 and 0.3498 respectively. This means, *ceteris paribus*, that for every 1 per cent increase in the interest rate, conventional demand deposits and conventional time deposits will increase by only 0.2731 and 0.3498% respectively.

Consequently, we can see that the real gross domestic product and interest rate also significant at the 1% level, explains the conventional time deposit. The elasticity of the conventional time deposits to the real gross domestic product and interest rate are 1.7276 and 0.3418 respectively. This result also shows that the real gross domestic product plays an important factor in determining the increase of the time deposit in conventional bank. This also means that the people have extra income to deposit their money in the bank.

Table 2 shows that the real gross domestic product, the profit-sharing (SPSD_t, SPST_t and IPS_t), the consumer price index, and the one-year lagged dependent variables are important in explaining the Islamic demand deposits, Islamic time deposits, and Islamic investment deposits. The profit-sharing are significant in explaining the Islamic demand deposits, Islamic time deposits and Islamic investment deposits at the 1%, 10% and 5 per cent level. Where as, the one-year lagged dependent variables are significant at the 5% level in explaining both the Islamic demand and time deposits.

TABLE 2. The regression analysis for the Islamic demand deposits, Islamic time deposits, and Islamic investment deposits

Dependent	Independent variables						
	Intercept	ln GDRL _t	ln SPSD _t	ln CPI _t	ln DDI _{t-1}	R ²	Durbin h
Ln DDI _t	-3.5217 (-1.845)	0.6895 (0.705)	1.3239 (3.583)***	-0.6359 (-0.632)	0.7495 (2.382)**	0.9608	0.84
			ln SPST _t		ln TDI _{t-1}		
Ln TDI _t	-3.6729 (-1.975)	0.6885 (0.689)	1.2526 (1.856)*	-0.2623 (-0.246)	0.7764 (2.848)**	0.9289	0.44
			ln IPS _t		ln IID _{t-1}		
Ln IID _t	-3.7435 (-1.422)	0.2426 (1.803)*	1.7188 (2.772)**	-0.7198 (-0.661)	0.7587 (2.775)**	0.9436	0.66

Note: Figures in parentheses are *t* values.

*, **, *** Significant at the 10%, 5%, and 1% level, respectively.

In addition, the results shows that the estimated responsiveness of Islamic demand deposits, Islamic time deposits and Islamic investment deposits to real gross domestic product are 0.6895, 0.6885 and 0.2426, which means, *ceteris paribus*, that Islamic demand deposits, Islamic time deposits and Islamic investment deposits will increase by only 0.6895, 0.6885 and 0.2426% for every one per cent increase in real gross domestic product. The weakness in the responsiveness of Islamic demand deposits, Islamic time deposits and Islamic investment deposits to real gross domestic product appears to confirm the observation made by Wilson (1998).

However, the results reveal that the profit-share is an important factor in explaining the Islamic demand deposits, Islamic time deposits and Islamic investment deposits. Profit-sharing for the Islamic demand deposits, Islamic time deposits and Islamic investment deposits are significant at the 5% level. The estimated elasticity of the Islamic demand deposits, Islamic time deposits and Islamic investment deposits with respect to profit-sharing are 1.3905, 1.2526 and 1.7188, respectively. This means, *ceteris paribus*, that for every 1% increase in the profit-share (rate of return) for demand deposits, time deposits and investment deposits will increase by 1.3905, 1.2526 and 1.7188%. The elasticity of Islamic demand deposits, time deposits and investment deposits may be caused by the capabilities of the depositors to respond in a positive manner to profit-sharing. Thus, in the case of Islamic demand deposits, time deposits and investment deposits, especially for the Islamic people or society, it depends on the profit-share (rate of return) which they can get from their deposits.

In addition, the results also show that the adjustment level is quite moderate for the all equation in the model, which 47.1% and 85.1% for the conventional demand deposits and conventional time deposits, whereas, 25.1%, 22.4%, and 24.1% for Islamic deposits.

A major criterion that is used to evaluate a simulation model is the fit of the individual variables in a simulation context. One would expect the results of a historical simulation to match the behaviour of the real world rather closely, so often one will perform a historical simulation and examine how closely each endogenous variable tracks the historical data. The measures that is most often used in this context, are the *Root Means Squared Error* (RMSE), *Root Mean Squared Percent Error* (RMSPE) and *Theil's Inequality Coefficient* or *U* statistics (Pindyck and Rubinfeld 1991).

Both the *RMSE* error is a measure of the deviation of the simulated variable from its actual time path. If the value is small, it means that the estimated value is more accurate. The results of the simulation exercise with respect to *RMSE* and *RMSPE* are shown in Table 3.

TABLE 3. Simulation Statistical Results

Equation	RMSE	RMSPE
Conventional demand deposit	0.0746	0.6889
Conventional time deposit	0.0398	0.3897
Islamic demand deposit	0.2737	2.4623
Islamic time deposit	0.2845	2.6979
Islamic investment deposit	0.2956	3.0664

While, the results regarding the *Theil's Inequality Coefficient* or *U* statistics are shown in Table 4.

TABLE 4. Simulation Statistical Results

Equation	<i>U</i>	<i>U^m</i>	<i>U^s</i>	<i>U^c</i>
Conventional demand deposit	0.003	0.000	0.001	0.999
Conventional time deposit	0.002	0.000	0.001	0.999
Islamic demand deposit	0.004	0.000	0.003	0.997
Islamic time deposit	0.005	0.000	0.004	0.996
Islamic investment deposit	0.005	0.000	0.006	0.994

Where

- U* is the *Theil's Inequality Coefficient*
- U^m* is the bias proportion
- U^s* is the variance proportion
- U^c* is the covariance proportion

However, there are also other methods that can be used to measure the accuracy of the simulation such as measuring the capability of the model to reach the turning points of the actual data. In this research, data for the period 1983-2001 were used; one simulation had been carried out to see the capability of the model to reach the historical data. The results from Figures 1 and 5 show that the base line simulation results can track the actual value. Based on the above mentioned three criteria, this model can be considered as a valid model.

In order to test the hypothesis that deposits with profit-sharing are more stable than deposits with interest, the stability of deposits function is tested with the aid of the *Chow* test. One of the more common applications of the *F* test is in tests of structural change. This test is labeled a *Chow* test, in reference to *Chow* (1960) who invented it. This test is to see if there is a shift in the structural data for these equations. The results of the

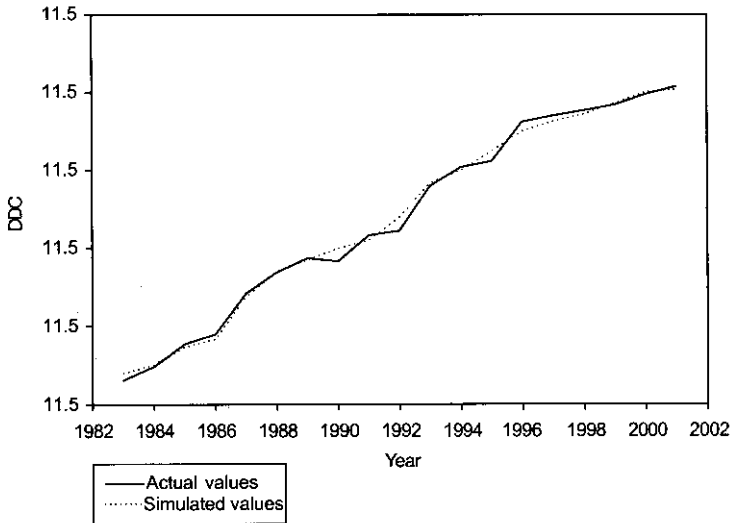


FIGURE 1. Simulation of the conventional demand deposit, 1983-2001

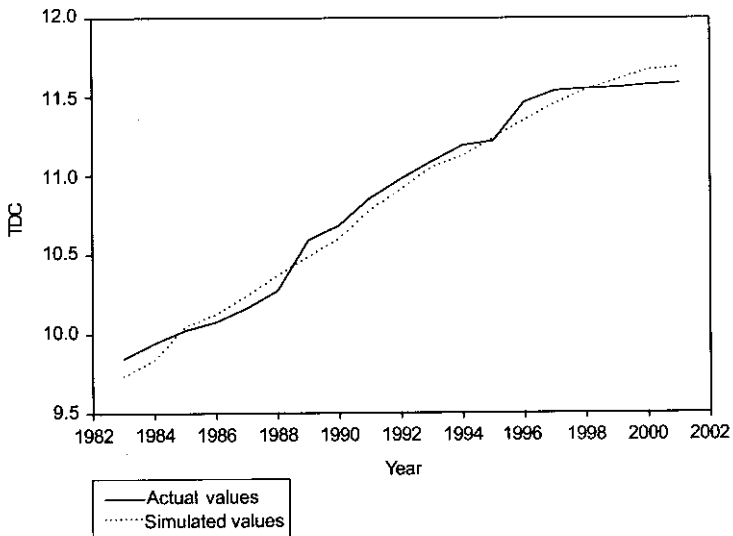


FIGURE 2. Simulation of the conventional time deposit, 1983-2001

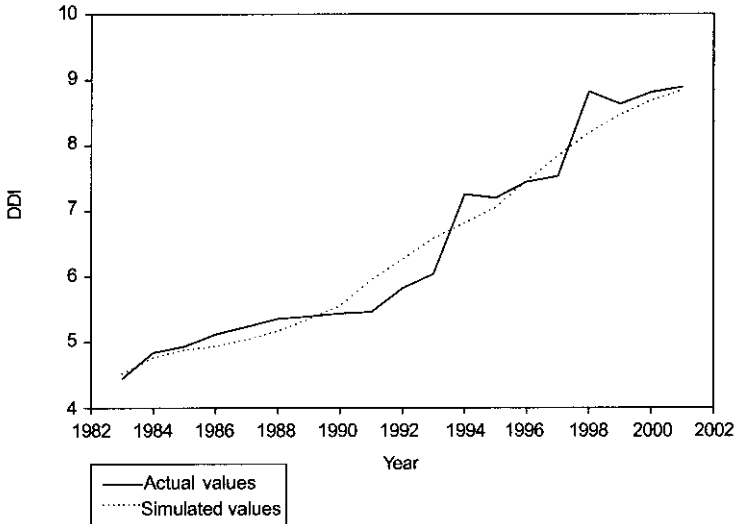


FIGURE 3. Simulation of the Islamic demand deposit, 1983-2001

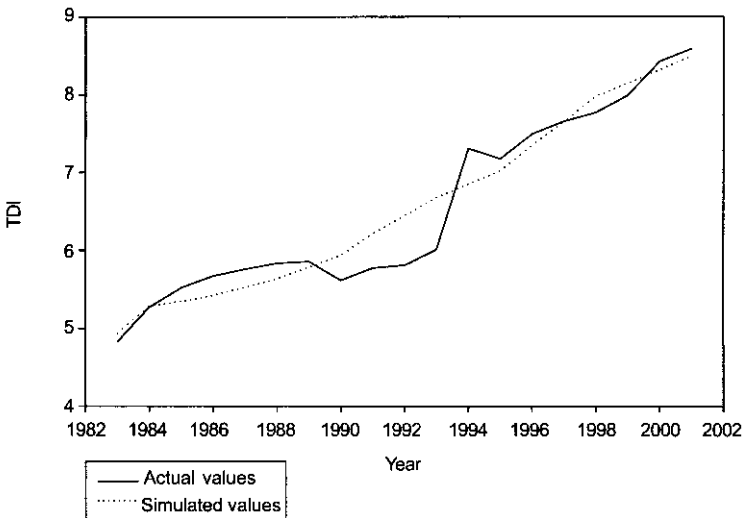


FIGURE 4. Simulation of the Islamic time deposit, 1983-2001

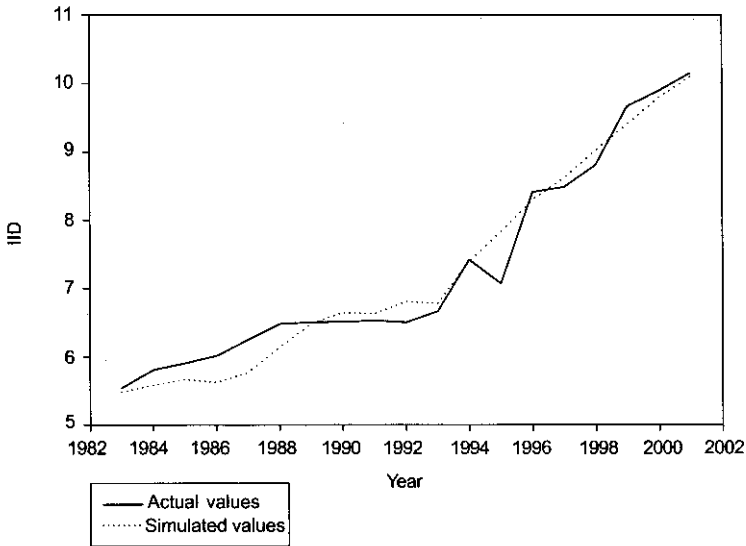


FIGURE 5. Simulation of the Islamic investment deposit, 1983-2001

Chow test for the Islamic deposits and conventional deposits are shown in Table 5.

TABLE 5. The structural stability test of conventional deposits and Islamic deposits

Model	F^c	Adjusted R^2
Conventional demand deposits	3.23	0.9814
Conventional time deposits	2.88	0.9921
Islamic demand deposits	1.62	0.9477
Islamic time deposits	2.17	0.9052
Islamic investment deposits	3.54	0.9248

Note: F^c is the *Chow* test statistics. The value of the F -statistic at the 10% significance level for the whole equation is 4.25.

The *Chow* test results above show that the all behavioural equations used in this model are stable throughout the research period, either for the conventional deposits and Islamic deposits. Therefore, all the equation should accept the null hypothesis. This means that there is no change in the parameter values at the significant level of 10% (Greene 2000).

This study finds that both the conventional and the Islamic deposits are stable. However, the Islamic demand deposit and Islamic time deposit are more stable than the conventional demand deposit and conventional time deposit this is measured through the value of the *Chow* test (F^c), which is smaller for the Islamic demand and Islamic time deposits than for the conventional demand and time deposits, as shown in Table 5. The values of *Chow* test for the Islamic deposits are 1.62 and 2.17 is smaller compared to the conventional deposits are 3.23 and 2.88.

There may be several reasons for this, such as: (i) The Malaysia government is using more, and depending completely on conventional monetary and fiscal developments policies as a whole in their efforts to achieve monetary and price stability, economic growth, development in financial market, money supply growth and so on, as compared to the Islamic financial instruments; and (ii) The excess of liquidity characteristics of Bank Islam Malaysia Berhad and Bank Muamalat Malaysia Berhad. This is happening for several reasons, namely: (a) the growth of deposits in Islamic banking far exceeds the demand for Islamic financing, especially during the period 1983 to 1992; (b) there is an inadequate numbers of Islamically-acceptable investment outlets, especially before the year 1992; (c) Bank Islam Malaysia Berhad and Bank Muamalat Malaysia Berhad remain profitable because of their low level of risk exposure and they are pursuing of a conservative financing policy despite excess liquidity; and (iii) The Islamic banks' policy is also implemented upon a policy of conservatism and is rooted in underlying observations such as: (a) severe losses that signal the failure of the philosophy and the implementation of Islamic banking and financial instruments; and (b) the nature of Islamic contracts undertaken are mostly based on the profit-sharing and trade financing rather than on the profit-loss sharing system. This means that the deposits and investment of the depositors in the Islamic banking and financial instruments are guaranteed by the bank and the government.

This finding supports those of Hassan (1996) and Kaleem (2000), but disagrees with the findings of Darrat (1988), Khan (1985), and Mustaq and Khan (1990), who found that Islamic banking is stable and is more crisis proof than conventional banking. However, Mahmood, Sohrab and McCormick (1997), in their study on monetary stability and interest-free banking, conclude that a case for the superiority of Islamic banking has, certainly in the case of Iran, not been made.

CONCLUSION

The research has shown how real gross domestic product, profit-share (rate of return to depositors), the consumer price index and the dependent variables lagged for one year are important factors in explaining the growth of Islamic demand deposits, Islamic time deposits and Islamic investment deposits. This can be seen from the values of elasticity for Islamic demand deposits, Islamic time deposits and Islamic investment deposits, which were 1.3905, 1.2525 and 1.7188 respectively in relation to the profit-share (significant at the 1%, 10% and 5% level respectively). The results of this research have significant policy implications for banking regulation. The Exposure Draft No 2 issued by the Islamic Financial Services Board examines the issue of capital adequacy standards for profit sharing investment accounts in terms of risk displacement to depositors and the implications of profit smoothing. These are only treated at the conceptual level however, with no reference to empirical work. It is suggested that investment *mudarabah* accounts have to be treated differently from accounts governed by conventional contracts as with the latter interest is determined exogenously regardless of bank performance whereas the former is subject to the banks profitability. Furthermore, the capital in *mudarabah* accounts is not guaranteed, which decreases bank liability in times of financial crisis. The findings of this study suggests that as *shariah* compliant deposits are more stable than their conventional equivalents, then this makes a run on deposits less likely, reducing the potential amount of capital adequacy cover needed. This applies to both Islamic demand deposits, which are guaranteed, and *mudarabah* time deposits, which are not. What matters is not simply the difference between conventional and Islamic bank deposit characteristics, but the reputation of the Islamic banks, and the high level of trust between depositors and the bank. Monetary returns are not ignored by depositors with Islamic banks, but client loyalty to their financial institution is determined by enduring non-pecuniary religious considerations and not simply short term expectations of monetary reward.

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