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***The Islamic Inter bank Money Market and a Dual
Banking System: The Malaysian Experience.***

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Abstract

This paper examines the operation of an Islamic Inter-bank Money Market (IIMM), within a dual banking system. The paper argues that even though an Islamic money market operates in an interest-free environment and trades Shariah-compliant instruments, many of the risks associated with conventional money markets, including interest-rate risks are relevant.

The empirical evidence, based on Malaysian data, points to Islamic money market profit rates/yields that are highly correlated and move in tandem with conventional money market rates. Given the dynamics of fund flows and cross-linkages, an IIMM operating within a dual banking system cannot sterilize itself from interest-rate risks.

In fact, the paper argues that such an IIMM may actually enhance interest-rate risk transmission to the Islamic banking sector, by providing additional channels of transmission. Ironic as it may be, the operations of an IIMM in a dual banking system may serve to bring the Islamic banking sector into closer orbit with the conventional sector.

Introduction

When Islamic banking was being introduced in Malaysia in the 1980's, the basic strategy was one of *replication*, essentially transforming the sources and application of funds of conventional banks into Islamically acceptable products. Thus, on the liability side, savings and current accounts became *Al-Wadiah* accounts, whereas fixed deposits became *Mudarabah* General Investment Accounts.

On the asset side, short-term loans were redesigned as *Murabaha* financing, while medium and long-term loans as *Bai al Bithaman Ajil* (BBA). This strategic choice of moving on the path of least resistance has been a success. Islamic banking has obviously taken root in Malaysia. Having grown at an annual average in excess of 50%, over the last decade, it now accounts for approximately 10% of the country's total banking sector. As an order of magnitude, total deposits within the Islamic banking sector was one-tenth of one percent (0.1%) in 1994. This level of growth is impressive by any measure.

This outstanding growth performance owes much to the initiative of Malaysia's central bank, Bank Negara Malaysia (BNM), in particular BNM's initiative in establishing the Islamic Inter-bank Money Market (IIMM) in January 1994. The ability to access a money market with *Shari'ah* compliant products, effectively unplugged the major bottleneck to growth, and the inability of Islamic banks to manage asset-liability mismatches. The near one-hundred-fold¹ increase in market share of Islamic Banks (IBs) since 1994 is probably attributable to the presence of a well functioning money market.

¹ Percent of deposits in IBs which stood at 0.1% in January 1994 have now come close to 10% of total.

Despite this success, however, many challenges remain. As an Islamic Money Market functioning within a dual banking system, it is in many ways operating in uncharted waters. There is little precedence or experience to draw upon.

This paper examines the issues and challenges that face an Islamic Inter-bank Money Market that operates within a dual banking system. The paper will argue that even though an Islamic Money Market operates in an interest-free environment and trades Shari'ah compliant instruments, many of the risks associated with conventional money markets, including interest-rate risks, are relevant to Islamic Money Markets operating in a dual banking system.

The paper is divided into five parts. Section 2 below, describes Malaysia's Islamic Inter-bank Money Market (IIMM). Section 3, examines some of the key risks associated with money market functions. In section 4, an empirical examination of the extent to which yields in the IIMM are correlated with conventional money market yields is undertaken. The implication of this on interest-rate exposure for the Islamic financial sector is discussed. Section 5 looks at some of the challenges and conclusions.

Malaysia's Islamic Inter-bank Money Market (IIMM)

The money market is a key appendage of the banking system. Banks depend on the money market to manage their liquidity. While liquidity management is not the only use of money markets for banks, it is by far the most important. In fact, banks depend upon and dominate the money market so much, that often they are known as the *Inter-bank Money Market*. The Inter-bank Money Market is no different from the

money market, only that it is bank dominated. With the exception of the US, where the money market is *Securities Dominated*, with funds being channeled through use of short-term securities such as Treasury bills and commercial papers, most money markets, including Malaysia's are bank-dominated. In bank dominated money markets, funds are moved through use of bank deposit instruments such as Banker's Acceptances (BAs) and Certificates of Deposit (CDs)

Given the links that the money market has with both the capital market and the banking system, it has become the ideal avenue for central banks to conduct monetary operations. As such, the first impact of a monetary policy change is always felt first in the money market. It is the short interest rate/yield, derived from money market trading, that first responds to central-bank policy implementation.

Adjustment in the bond-cum-equity market and banking system follow the money market reaction. Thus, a well functioning money market properly transmits policy initiatives to the rest of the financial system. Occasionally, central banks may also use the money market for credit allocation purpose. While the money markets of developed nations evolved from the correspondent banking system of the early days, Malaysia's money market - like its Islamic counterpart, the IIMM - were established by fiat, i.e. at the behest of Bank Negara Malaysia.

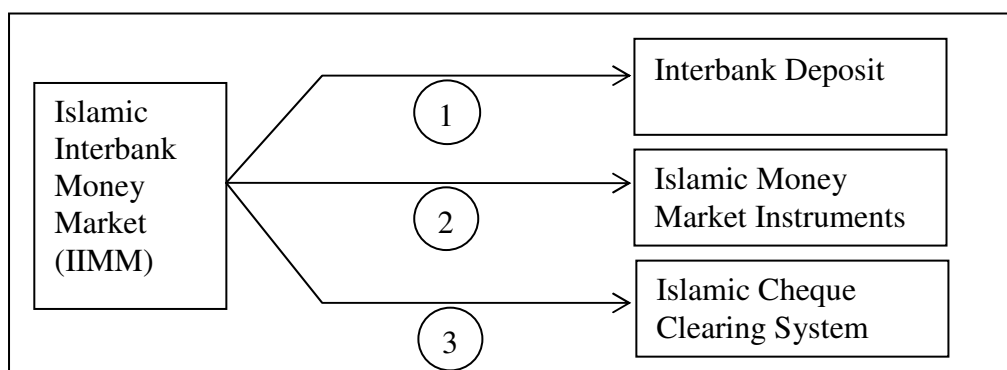
Some ten years after the establishment of the first Islamic bank in the country (Bank Islam Malaysia Berhad in 1983), the creation of an Islamic Inter-bank Money Market (IIMM) was announced. The intervening 10 years had shown the need to have a *Shariah*-compliant money market. Until the establishment of the IIMM in January 1994, the Islamic banking sector had to rely on a single instrument, the Government

Investment Certificate (GIC)² to manage liquidity. Aside from the fact that it was the only available *Shariah* compliant instrument, there was another limitation, there was no secondary market for the instrument.

The Islamic financial institutions could only deal with BNM, the central bank. They would buy the GICs from BNM when they have surplus liquidity, and sell them to BNM when in need of liquidity. For a banking sector that was fast growing, this was an inadequate arrangement. Thus, the need for a full fledged Islamic Inter-bank Money Market (IIMM). In “designing” an Islamic monetary market, BNM had no existing workable model to follow. In creating its own design, the obvious choice was to structure a *Shari’ah*-compliant version of conventional money markets. Thus, the IIMM was created, by using a conventional money market template. While this was once again the path of least resistance and one that would be familiar to Malaysian bankers, as we shall see later it exposes the Islamic banks to certain risks, which paradoxically, should not exist for Islamic banks.

Following the structure of conventional money markets, the IIMM had three components. A *mudarabah*-based inter-bank market for deposits, a platform for issuing and trading short-term Islamic financial instruments, and an Islamic Cheque Clearing System (ICCS).

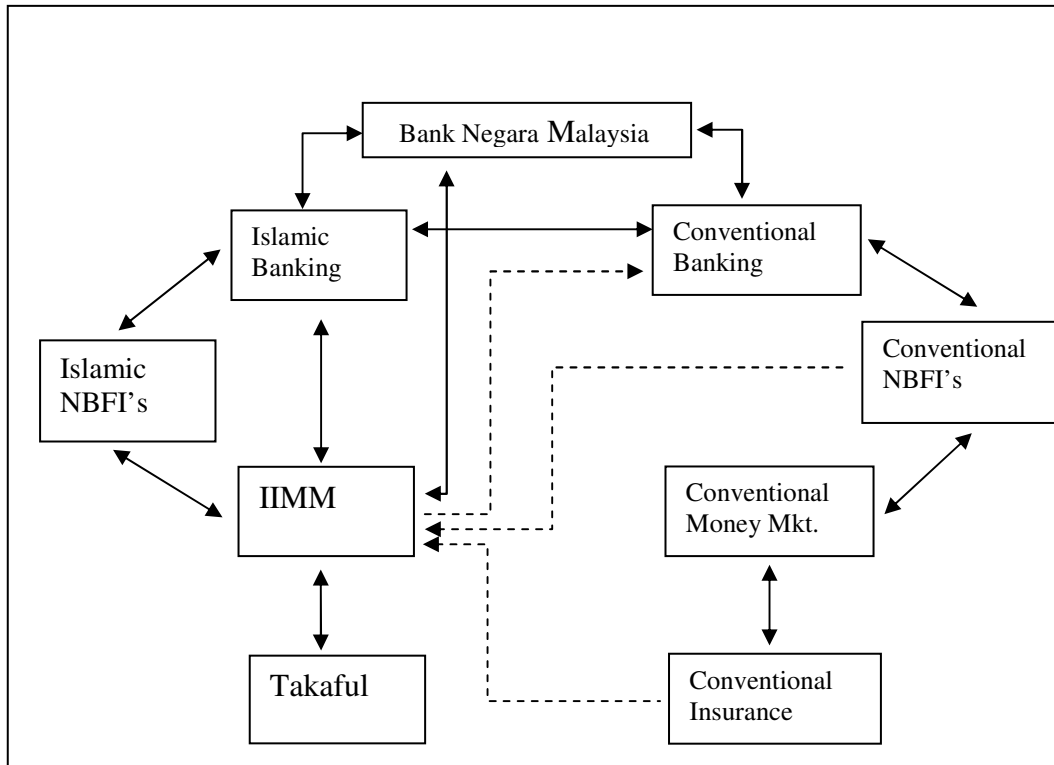
Fig. 1: Overall Structure of the IIMM



² The GIC has now been replaced by the GII (Government Investment Issues)

When placed within the country's overall financial system, the IIMM's role and connection would be as follows:

Fig. 2: IIMM within the Banking / Insurance System.



As Figure 2 shows, as a result of Malaysia's dual banking system there is an interesting dimension to the IIMM. Not only do Islamic banks and other Islamic financial institutions have access, conventional banks, insurance companies and other conventional NBFIs (non-bank financial institutions) have access to the IIMM. This is particularly so, for the second component of IIMM, which is Islamic money-market instruments. While Islamic financial institutions have no access to the conventional money market, the opposite is not the case.

Conventional financial institutions have access to the IIMM. There are no limits on the participation of conventional financial institutions in buying Islamic money

market instruments or selling the ones they own. They cannot issue their own Islamic papers into IIMM, nor bid for them in the primary market.

In the secondary market, however, there is no differentiation. In fact, until end-2003, conventional banks were allowed to issue *Green BAs* which were essentially Islamic banker's acceptances. This effectively meant that conventional banks could raise funds in the IIMM. The *Shari'ah* compatibility of the Green BAs came from the fact that their underlying asset was *halal*. Since January 2004, the practice has been disallowed and *Green BAs* have ceased to exist.

The Islamic Inter-bank Market

Before going on to discuss the instruments traded, we take a quick overview of the other two components of IIMM, namely the Islamic inter-bank market and the cheque clearing system. Of the two, the inter-bank market is by far the more important. At the heart of the Islamic inter-bank market is a mechanism known as the *Mudarabah* Inter-bank Investment Scheme (MII). This is the mechanism by which Islamic banks can borrow and lend among themselves. Moreover, banks with surplus funds can invest with those with liquidity deficits. As the name suggests, the financing is *mudarabah*-based with a negotiated profit-sharing ratio. The minimum amount of investment in the MII is RM 50,000. The term of investment can vary from overnight to 12 months. In the early years of the Islamic Inter-bank Market, the rate of return on the MII used to be based on the gross profit rate on one-year investments that the receiving (borrowing) bank was paying to depositors.

It soon became evident that there was an *incentive problem* here. It was to the receiving bank's advantage to "declare" a lower profit rate. In a sense, the rates of return were dictated by the returns of the "inefficient" banks. To overcome this

problem, BNM revised the rules by setting a minimum benchmark rate for the MII.³ With this revision, the minimum rate of return for the MII was set to equal the prevailing rate of the GIC (Government Investment Certificate) plus a spread of 0.5%.

$\text{Rate of return for MII} \geq \text{Return on GIC} + 0.5\%$

Pricing the *Mudarabah* Inter-bank Investment Funds.

Given the above description of the MII, the pricing or cost of funds for a given amount and term would depend on two unknowns:

- (i) The profit-sharing ratio (PSR) which is to be negotiated.
- (ii) The gross profit rate before distribution of the receiving bank on one-year investments that it will declare. This declaration will be made by the receiving bank at the maturity date of the MII. This means that once the profit-sharing ratio is agreed upon, there is only one unknown, namely the profit rate that will be declared by the receiving bank. However, part of this uncertainty is reduced in the sense that the investing bank knows that it will the *higher* of the following:
 - The prevailing rate on GIC of same term + 0.5% (annualised), if the declared profit rate is lower than this, *or*
 - The declared profit rate adjusted for PSR; if it is higher than the GIC + 0.5% annualised.

The formula used in determining the (price) profit amount due to the provider of funds (investing bank) is as follows;⁴

³ This revision became effective in February 1995.

$$X = \frac{Pr t(K)}{36500} \dots\dots\dots Eq. (1)$$

Where;

X = Ringgit (RM) amount to be paid to investing bank

P = Face value / principal amount of investment

t = Term in days of investment

r = Gross profit rate before distribution declared by receiving bank on one year investments

K = Profit sharing ratio.

Appendix 1 provides an illustration of the MII mechanism and settlement.

The Islamic Inter-bank Cheque Clearing System (IICCS)

In addressing the need to establish a separate cheque clearing system for the Islamic banking sector, BNM undertook two initiatives. First, it required all Islamic banks to maintain an *Al-Wadiah* based (safe-custody basis) current account with BNM. Second, it required the same Islamic banks to empower it to square off the funding position, between surplus and deficit banks, during the automatic cheque clearing process at midnight. The empowerment by the banks to BNM is based on the *Al-Wakalah* concept. The surplus funds of an Islamic bank are placed with other Islamic banks which might have a deficit.⁵

Once again, the placement of funds from a surplus bank to a deficit one is done on the *Mudarabah* concept, as in the case of MII. However, in this case the profit-sharing ratio is fixed at 70:30. The same formula as in Eq. (1) above is used in determining

⁴ Note: the 36500 in the denominator is 365 days X 100. Thus, in the numerator the percent ‘r’ will be entered as a whole number and not as decimal.

⁵ When the total surplus and deficits are not equal, a weighted average method is used in allocating funds.

the profit to be paid by the deficit units. The Islamic Inter-bank Cheque Clearing System is really a sub-segment of the overall cheque clearing system handled by the KLACH (Kuala Lumpur Automated Clearing House).

Islamic Money Market Instruments

In developing the Islamic money market, BNM had introduced a series of *Shari'ah*-compliant money market instruments. In doing so, the basic strategy was also one of replication. Recall that replication was also the strategy used in introducing Islamic banking. Extending this strategy to money market instruments, common-money market instruments were “Islamised” by removing the interest-bearing feature and replacing it with either a profit rate or a mark-up feature. Thus, where there were Banker’s Acceptances, we have Islamic BAs, Negotiable Instruments of Deposits (NIDs) were replicated as Negotiable Islamic Instruments of Deposit (NIIDs), Malaysian Treasury Bills became Malaysian Islamic Treasury Bills and so on.

Depending on when the observation is made, there could be 8 to 10 different types of instruments available for trading in the IIMM. The number of instruments varies since some instruments may only be issued intermittently. Appendix 2 describes some of the more popular instruments and their underlying Islamic contracts. *Mudarabah* based bonds and *Ijarah* based *Sukuks* are also available. The *Bai Al Dayn* or debt trading concept is applicable to instruments such as Islamic Accepted Bills (IABs). Given the controversy surrounding the acceptability of *Bay Al dayn*, it is not as popular as it once was. *Qard Al-Hasan* which used to be the mode underlying the GICs and later the GIIs, appears to have fizzled out. Given the uncertainty of the redeemable face value under the *Qard-Al-Hassan* concept, it was not suited for a

secondary market traded instrument. Thus, the GII is now issued under the *Bai Al-Inah* concept, while secondary market trading of these papers is based on *Al-Dayn*.

Perhaps in response to rising wariness and some unease about trading financial papers, BNM has recently launched with much fanfare, a *Commodity Murabaha* contract. Based on crude palm oil (CPO), this commodity murabaha contract is intended to be a liquidity management tool (See description in Appendix 2). The only contract that continues to use the *Qard-Al-Hasan* concept is the *Rahnu* Agreement (RA-i). This however is a collateralized facility which is only available with BNM.

Aside from replicating conventional instruments, a number of trading methods/processes have also been adopted from conventional money markets. The best example being, the replication of the highly popular Repurchase Agreements (REPOs) as the Sell and Buy Back Agreement (SBBA). Under the SBBA, following the initial sale at a negotiated price, the parties enter into a separate agreement to reverse the trade at a newly negotiated price.

Pricing of Islamic Money Market Instruments

As IIMM's instruments and processes have largely been structured using the conventional template, the pricing of these instruments by and large, follow the conventional logic of discounting. The key difference being that, whereas the prevailing interest rate of appropriate term to maturity is used in conventional pricing, the profit-rate or mark-up rate is used in discounting Islamic instruments. In fact, even the *Ar-Rahnu* (RA-i) facility described earlier as being based on the *Qard-Al-Hasan*

concept provides a *hibah* (gift) which is determined based on average Islamic interbank rates of return

If product design, trading processes and pricing methods have all been synthesized from conventional forms, it raises the question of, how different then is the Islamic money market from its conventional counterpart? In so far as the objective of providing the Islamic banking sector with a proper avenue for liquidity management is concerned, the IIMM has undoubtedly succeeded. However, as will be argued in the next section, as a result of such replication, a number of risks and issues arise that could accentuate the vulnerability of Islamic banks-particularly in the Malaysian dual banking context.

IIMM and Dual Banking; Issues of Risk

The money market, as is the case with any financial market or instrument, has a number of associated risks. Where the conventional money market is concerned, most previous literature identify four key risk categories. These are (i) Counterparty risk (ii) Liquidity risk (iii) Interest rate risk and (iv) Regulatory risk. Of these, liquidity and interest rate risk are typically the most important. Obiyathulla (2004a) examines the relevance of interest rate risk to the Malaysian Islamic banking sector. Based on the correlation between rates of return of Islamic banks and the 3 month interest rates of conventional banks, the paper argues that there is extensive interest rate exposure for the Malaysian Islamic banking sector. Deposit formation across the two banking sectors was also strongly linked. The free flow of funds between the two banking sectors and the large pool of non-Islamic clients that Islamic banks have, would ensure arbitrage flows if rates were different between the sectors. As a result, not only

were the rates similar across both banking sectors, they were also very closely correlated.

If Islamic banks operating within a dual banking system can have interest rate exposure through cross deposits, is interest rate risk relevant when we have an IIMM operating within such a system? This is an empirical question which we will address in the following section. The other risks associated with conventional money markets, counterparty risk, liquidity risk and regulatory risk are obviously also applicable to an IIMM. However, there are may be two additional risks unique to Islamic money markets. These are Accounting Risks and *Shari'ah* Risk.

Accounting risks in this context refers to the risk that the borrower in a profit-sharing relationship might understate profits. Instruments based on *Mudarabah* and *Musyarakah* type contracts would be susceptible to such risk. While one might think that such a risk would be substantially less for money market instruments given their short-term nature, accounting risk is highly relevant. A good example would be the new policy that BNM had to introduce, precisely to overcome the problem of “understated” profits with the *Mudarabah* Inter bank Investments (MII). In February 1994, about a year after the establishment of the IIMM, BNM had to introduce a minimum required return on MII equivalent to prevailing GII +0.5% (annualised). This move was necessitated by fact that “there was exploitation by the inefficient banks.”⁶ Though the PSR is dictated by the investing bank, the profit rate declared at maturity is determined by the receiving bank. The receiving banks were understating profits leading to possible disintermediation of the process. Thus, the need to impose a minimum required rate of return.

⁶ See: The Central Bank and the Financial System in Malaysia, A decade of change BNM (40th Anniversary Issue) pg 248.

Shari'ah Risk, a counterpart of regulatory risk, it refers to the possibility that transactions/instruments currently deemed acceptable could subsequently be prohibited. Some examples of this type of risk would be (i) the issue of mark-ups in Pakistan and (ii) the controversy surrounding *Bai Al-Dayn* based transactions. *Bai Al-Dayn* transactions certainly appear to be reducing in Malaysia. Of late, even the highly popular *BBA* based contracts in Malaysia are being questioned. The fact that *Green BA's*, once a popularly traded instrument on the IIMM have now completely stopped is a good example of such risk.

Of the risks discussed thus far, *Interest Rate Risk* is probably the most critical where money market instruments are concerned. From a conventional viewpoint, a key role of money markets is price-discovery. Essentially, the formation of short-term interest rates and thereby, the short-end of the yield curve. Since money market trading is designed to be reflective of rate movements, conventional money market instruments are highly rate sensitive. Additionally, since central banks typically use the money market to execute monetary policy, the money market would usually be the first to react to rate or liquidity changes. Interest rate risk manifests itself in several ways.

The three key forms being:

- i) Prepayment risk
- ii) Reinvestment risk and
- iii) Re-pricing risk

Given the short-term nature of money market instruments, prepayment risk is a non-issue. Though reinvestment risk is relevant, re pricing risk is by far the most important

for money market instruments. Given the discounted form of their pricing, rate movements would have a highly significant and direct impact.

Relative yields and Correlation, Evidence from Malaysia's Conventional Money Market and the IIMM.

Are such interest rate risks relevant for the IIMM? The raison d'être of an Islamic Inter bank Money Market is to enable interest free trading. Yet, as we saw in earlier sections, an IIMM operating within a dual banking system has extensive linkages and cross linkages with the conventional banking/financial sector. Given these realities, it is only logical that activities in the IIMM cannot be completely detached from the rest of the system. Arbitrage flows would work their way into or out of the IIMM through any of the several linking channels. Since the IIMM replicates of the conventional system, both in terms of trading processes and instruments, any yield differences between the IIMM and the rest of the system would constitute a *pure arbitrage opportunity*. As such, a well functioning IIMM operating within a dual system would inevitably have yields/profit rates that closely resemble the yields and interest rates in the conventional system. Such synchronicity however, has a huge implication about the relevance of interest rate risk to a supposedly "*interest-free*" market.

To examine this relevance, an empirical study of the daily quoted yields in Malaysia's IIMM and the conventional money market was undertaken. Specifically, a total of four inter bank yields were examined. These were the daily quotes for the (i) overnight, (ii) 1 week, (iii) 1 month and (iv) 3 month inter bank transactions. The conventional yields are the KLIBOR rates of respective terms whereas for the IIMM, it is the KLIRR (Kuala Lumpur Islamic Reference Rates) of respective maturity.

Daily data from October 1998 to end April 2007, a period of slightly more than 8.5 years is used. This constituted a total of 2,328 daily observations⁷ for the 4 pairs of yields (8 different daily rates). The conventional money market data was sourced from BNM's website while IIMM data from the IIMM website. Following Obiyathulla (2004), linkage between the two money markets is examined in two ways. First, by doing a Pearson Pairwise Correlation and second by estimating the following OLS regression equation;

$$\boxed{IIR = \lambda + \beta \cdot CIR + e} \dots\dots\dots(2)$$

Where: IRR = Islamic Inter-bank Rate

CIR = Conventional Inter-bank Rate

The above equation will be estimated 4 times in each case using the overnight, one week, one month and 3 month rates. Since the null hypothesis tested would be that $\beta = 0$, a statistically significant positive value of the Beta Coefficient would imply high correlation between the rates. To see if a causal relationship might exist, the Granger Causality test (2 lags) is used.

Results

Figures 3 to 6 show the plot of the Islamic and conventional rate for overnight, 1 week, 1 month and 3 month inter-bank deposits. The similarity in rates and their co-movement is obvious in each and every case. Over the 8.5 year study period, there appears to have been four interest rate regimes. First, a period of sharply declining

⁷ In some of the sub periods there was missing IIMM data. In such case both observations for the day were dropped.

rates followed by a second period of stable interest rates. This is then followed by a third period of steadily rising rates. The final fourth period of about one year, again has stable rates. These four sub periods have been demarcated on the graphs. The co-movement of both the conventional and Islamic rates are apparent *regardless* of the interest rate environment. Table 1 below shows the results of our Pearson Pair-wise Correlation test.

Table 1: Results of Pearson Pair-wise Correlation for Overall Period

<u>Paired Rates</u>	<u>Correlation Coefficient</u>
(i) Overnight	0.949027
(ii) 1 week	0.975201
(iii) 1 month	0.967945
(iv) 3 month	0.934128

Table 1(a) in Appendix shows the correlation by sub-periods. It is obvious from these results that despite being two separate markets, each supposedly with its own “price-discovery” process, the yields across both markets are strongly linked. These linkages are further confirmed by the results of the OLS regression. Table 2 below is a summary of the results.

Table 2: Summary Results of Regression Analysis

Rate	No. of Obs.	Beta Coeff.	t-stat	Prob.	R ²
(i) Overnight	2328	0.7627	145.21	0.00*	0.90
(ii) 1 Week	2327	0.7849	212.46	0.00*	0.95
(iii) 1 Month	2328	0.8202	185.87	0.00*	0.94
(iv) 3 Month	2328	0.8038	126.22	0.00*	0.87

The results are based on Regression Equation 2.

In all cases, the null hypothesis that $\beta = 0$ which would imply that rate formation is different in both markets is strongly rejected. The fact that beta is positive also tells us that changes in both the Islamic and conventional money markets are unidirectional.

While both the above results confirm the existence of very strong correlation between Islamic and conventional money market rates, they do not necessarily prove causality. To test for causality, the Granger Causality tests (2 lags) were conducted. The results for the 4 pairs are shown in Table 3 below.

Table 3: Results of Granger Causality Tests
(Full sample; Overall period)

Null Hypothesis:	No. Obs.	F-stat.	Prob.
Overnight Rates			
COR does not Granger Cause IOR	2326	67.2671	0.00000
IOR does not Granger Cause COR		47.2928	0.00000
One Week Rates			
C1WR does not Granger Cause I1WR	2323	85.2958	0.00000
I1WR does not Granger Cause C1WR		1.19066	0.30421
One Month Rates			
C1MR does not Granger Cause I1MR	2326	37.8933	0.00000
I1MR does not Granger Cause C1MR		12.4855	4.0E-06
Three Month Rates			
C3MR does not Granger Cause I3MR	2326	12.0418	6.3E-06
I3MR does not Granger Cause C3MR		8.16969	0.00029

In all four cases, as Table 3 shows, the hypothesis that the conventional rate does not Granger Cause the equivalent IIMM rate is rejected. With the exception of the one week rates, there is a feedback relationship in the other three rates.

These results are very much in line with the results of Obiyathulla (2004a). That study examined two variables, the 3 month interest rate offered by conventional banks with 3 month profit rates offered by Islamic banks and Total Deposit rates in the two banking sectors. Using monthly data over a 10 year period, the study found very strong correlation across both sectors for both interest / profit rates and deposits. Granger-Causality analysis showed strong one way causation from the conventional banking sector to the Islamic banking sector.

It appears therefore, that, as was the case for the banking sector, our analysis of money markets here, also shows strikingly similar results. Despite each sector, conventional and Islamic, having its own infrastructure, different sets of instruments, different regulatory structures and different philosophical frameworks, the end results appear the same. So what do these results imply for the Islamic banks, which are the main users of the IIMM?

Conclusion: Implications and Challenges

Islamic money market yields that move in sync with conventional rates simply means that, users of an IIMM would face the same extent of interest rate risk that conventional players do. It is indeed ironical that despite creating new markets and institutions that are supposed to enable interest free operations, players end up with as much interest rate exposure if not more. This, unfortunately is the reality of IIMMs operating within a dual banking system. Just as water cannot be at two levels within the same container, an Islamic financial system operating within a larger conventional

macro environment cannot completely sterilize itself from interest rate risks. If a common customer pool that can freely move funds between banking systems is the explanation for interest rate risk transmission to Islamic banks. The results of this study imply that the existence of an IIMM may actually enhance this transmission. There are at least 3 additional channels of transmission with an IIMM. These are; (i) through the pricing in inter bank rates, (ii) through the pricing of Islamic money market instruments and (iii) through the central bank's money market operations.

Given the very strong correlation we have seen between the inter-bank rates, changes in interest rates in the conventional money market would simply be transmitted to Islamic banks when they use the IIMM for their liquidity management. Similarly, since IIMM instruments are priced using discounting, interest rate changes cause re pricing risk because discount rates change. Prices and yields of IIMM instruments will invariably converge with those of conventional money markets because of the possibility for pure arbitrage. As such, Islamic institutions issuing IIMM instruments will face higher cost if conventional interest rates rise, while investors of IIMM instruments would get lower returns if the opposite happens. The third transmission channel arises from central bank intervention. Regardless of whether the intervention is a routine open market operation to influence liquidity or execution of new monetary policy, the central bank's actions in the IIMM *must* reflect its actions in the conventional money market. Failing which, profitable arbitrage against the central bank or a carry trade between the markets would both be feasible. Given this, no matter how supportive a central bank is of the Islamic financial sector, it cannot possibly maintain dual rates nor cause changes in one market and not in the other.

Thus, Central Bank actions would constitute another channel/means of interest rate risk transmission.

Paradoxical as it may seem, the implication is that an IIMM could bring the Islamic banking sector into closer orbit with the conventional sector. Does this mean that not having an IIMM is better in a dual banking system? Obviously not. While an IIMM may provide additional channels for rate risk transmission, as we saw in the first section, it nevertheless plays several pivotal roles, liquidity management being the most important. The challenge then is to have well functioning IIMMs that do not pass on rate risks. One tempting solution is to detach the Islamic financial system from the conventional one and keep it truly separate by not allowing transactions across markets. Not only would this not be feasible, it would also be hugely distortionary and very costly to maintain. Unless the Islamic financial sector is to be kept as a small niche, it would simply not be possible to keep it totally detached. For countries like Malaysia and most GCC countries which are trading nations locked into the global economic system, this is not an option.

Rather than aiming to detach the Islamic financial system from the conventional, a more realistic and workable approach, may be one of reducing the reliance. That is, an incremental approach that reduces the reliance that IIMMs now have on the conventional money markets. Since such reliance is currently domestic in nature, resulting in “one prevailing interest rate / cost of capital” across both Islamic and conventional sectors, some de-linking may be achieved by linking IIMMs across borders. In essence making an IIMM in one country more dependent on an IIMM across borders rather than on its domestic conventional counterpart. A large part of

the current dependence on conventional money markets is due to the smallness of IIMMs, their lack of instruments, shallow liquidity etc. Linking them across borders eliminates many of these problems. Risk will be dissipated and not concentrated on small national IIMMs. The benefits would be akin to that of the insurance industry, where “domestic” risk is internationalised through reinsurance across borders

Attempting to link IIMMs across countries would obviously raise its own set of problems. Issues of regulatory regimes, taxes, exchange controls, currency risks, etc would arise. However, linking IIMMs across countries need not necessarily be a totally new phenomenon. There is precedence, the Euromarkets. The Eurocurrency markets are really an ‘offshore’ version of the domestic money markets of the US, UK, Japan etc. An internationally linked network of IIMMs could bring about many of the benefits, particularly in the areas of risk management that the Euromarkets have brought. Yet, the Euromarkets were not created by design but came about spontaneously to fulfill latent demands. There is much that we can learn from the experience of the Euromarkets as we seek to develop and enhance Islamic money markets

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Fig. 3 Overnight Rates (Conventional Vs. Islamic)

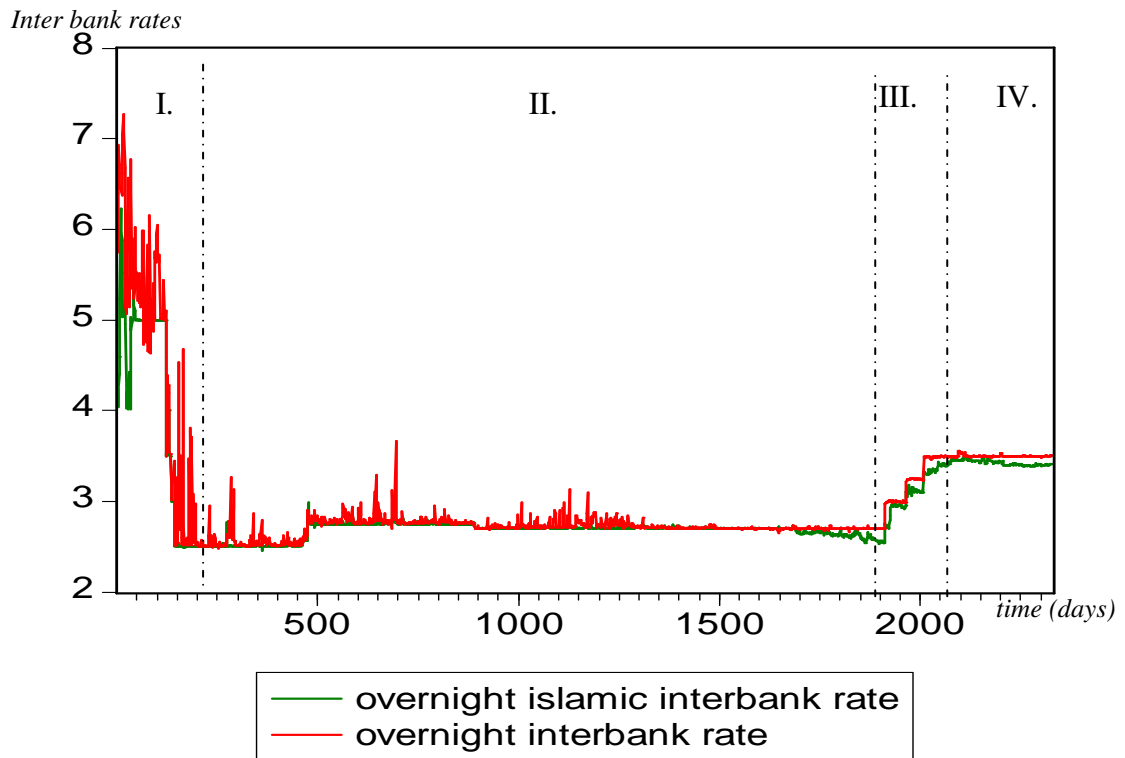


Fig. 4. One Week Inter bank Rates (Conventional Vs. Islamic)

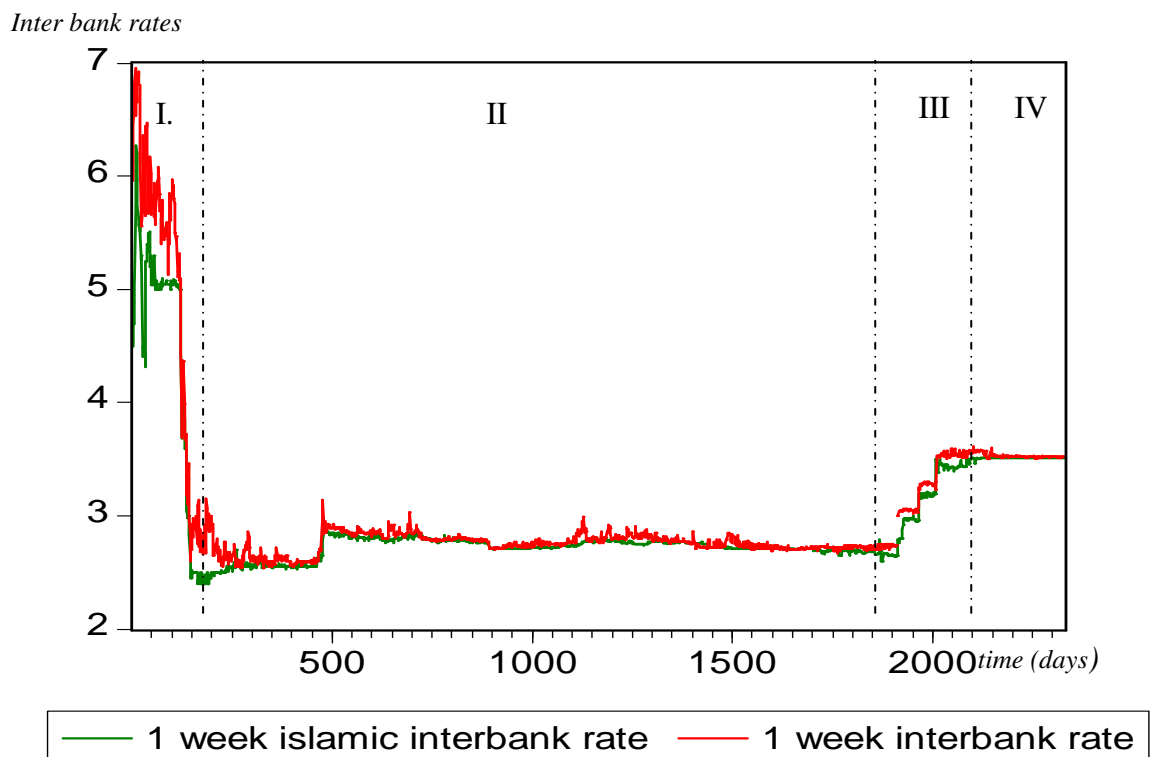


Fig. 5 One Month Inter bank Rates (Conventional Vs. Islamic)

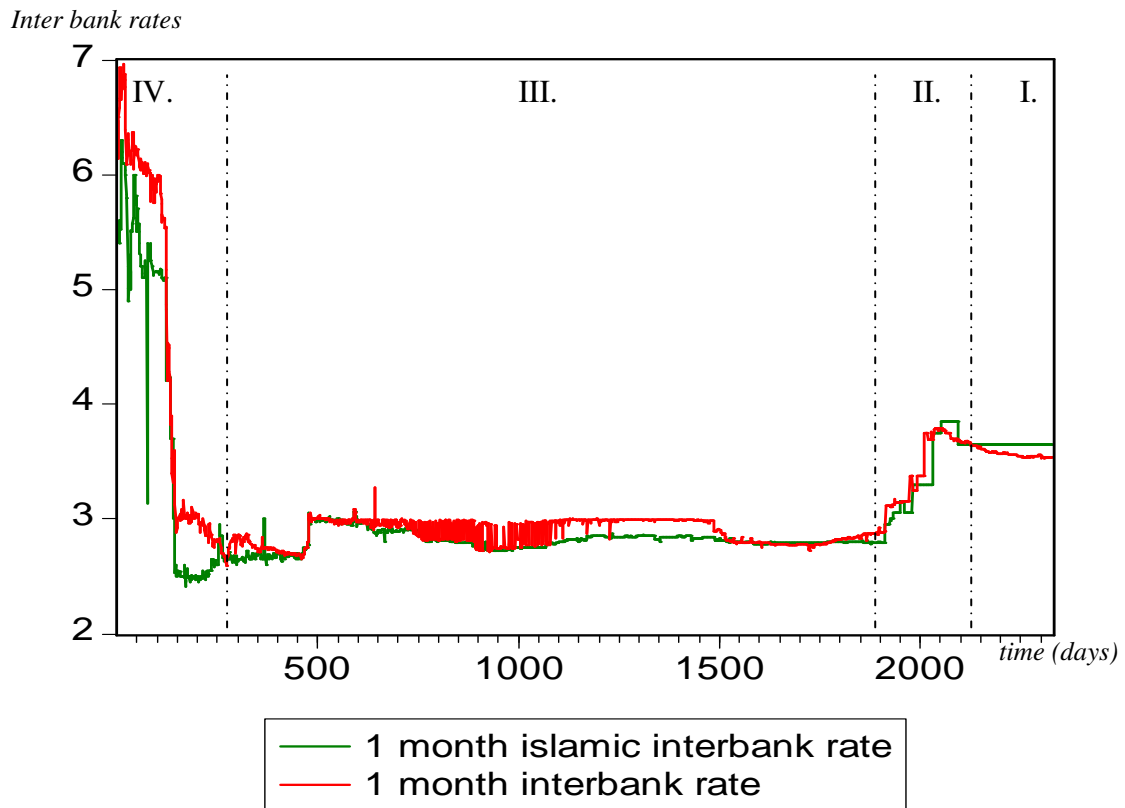


Fig. 6 Three Month Interbank Rates (Conventional Vs. Islamic)

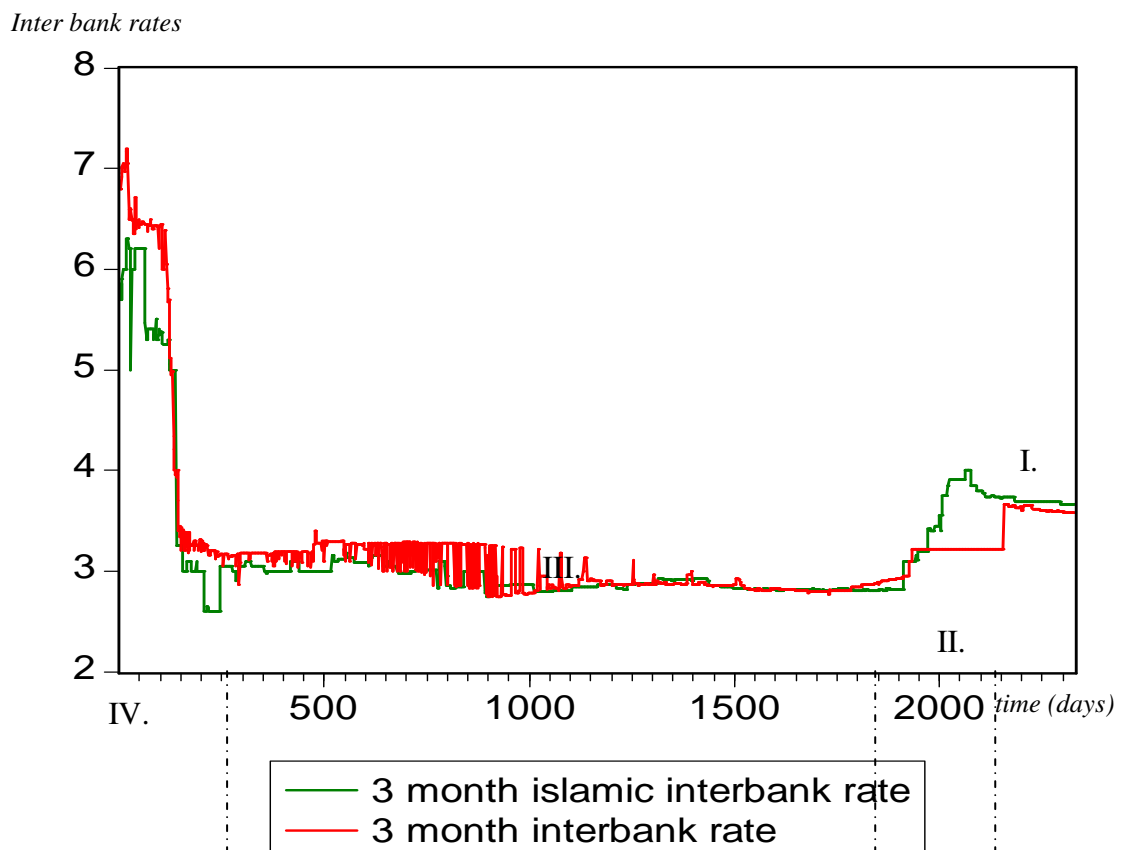


Table 1 (A)
Pearson Pair-wise Correlation by Sub Period ⁸

(1) Sub Period 1: (12 October 1998 – 30 March 1999)			(2) Sub Period 2: (1 April 1999 – 30 November 2005)		
	IOR	COR		IOR	COR
IOR	1.000000	-0.045273	IOR	1.000000	0.688294
COR	-0.045273	1.000000	COR	0.688294	1.000000
	I1WR	C1WR		I1WR	C1WR
I1WR	1.000000	0.384106	I1WR	1.000000	0.822603
C1WR	0.384106	1.000000	C1WR	0.822603	1.000000
	I1MR	C1MR		I1MR	C1MR
I1MR	1.000000	0.634571	I1MR	1.000000	0.740138
C1MR	0.634571	1.000000	C1MR	0.740138	1.000000
	I3MR	C3MR		I3MR	C3MR
I3MR	1.000000	0.535968	I3MR	1.000000	0.769780
C3MR	0.535968	1.000000	C3MR	0.769780	1.000000
(3) Sub Period 3: 1912 – 2008 (1 December 2005 - 26 April 2006)			(4) Sub Period 4: 2009 – 2328 (27 April 2006 – 30 April 2007)		
	IOR	COR		IOR	COR
IOR	1.000000	0.834129	IOR	1.000000	0.386192
COR	0.834129	1.000000	COR	0.386192	1.000000
	I1WR	C1WR		I1WR	C1WR
I1WR	1.000000	0.898732	I1WR	1.000000	-0.256179
C1WR	0.898732	1.000000	C1WR	-0.256179	1.000000
	I1MR	C1MR		I1MR	C1MR
I1MR	1.000000	0.718625	I1MR	1.000000	0.218406
C1MR	0.718625	1.000000	C1MR	0.218406	1.000000
	I3MR	C3MR		I3MR	C3MR
I3MR	1.000000	0.498147	I3MR	1.000000	-0.720529
C3MR	0.498147	1.000000	C3MR	-0.720529	1.000000

⁸ The four sub periods of different interest rate regimes are demarcated in graphs, Figs. 3-6

Appendix 1

Settlement of MII at Maturity – Illustration

To see how an MII transaction would be settled at maturity, we work through a simple example. Suppose, Ambank Islamic has a surplus of RM 5 million that it wishes place out for 3 months in the Islamic Interbank Market. Bank Muamalat on the other hand is in need of liquidity. Assume it needs RM 5 million of funds for 3 months. Since the quantum and tenor of funds is dictated by their needs, the only thing that has by to be negotiated is the profit-sharing ratio (PSR). Let us say they agree on a PSR of 75:25. That is Ambank, which is the investing bank will receive 75% of Bank Muamalat's declared gross profit before distribution on year investment (deposits) that it has had.

Based on this agreement, Ambank Islamic will place a RM 5 million deposit with Bank Muamalat. 90 days later, the receiving bank, Bank Muamalat will have to return the principal of RM 5 million plus a profit amount. This profit amount will depend on the one remaining unknown which is Bank Muamalat's declared gross profit on one year investments. If this profit is higher than the prevailing GIC rate + 0.5% than the declared profit percentage will be used in Eq.1 to determine the profit compensation to Ambank. If on the other hand the declared gross profit of Bank Muamalat on 1 year investments is lower than the GIC rate + 0.5% annualised, than Ambank profit amount will be determined by the latter percentage.

Let us say, Bank Muamalat declares a gross profit of 6% before distribution on its one year investments. Assuming this is higher than the prevailing GIC rate + 0.5%, the profit amount to be paid by the receiving bank to the investing bank Ambank Islamic would be;

$$\begin{aligned} X &= \frac{[RM\ 5,000,000(6\%)(90)][.75]}{36500} \\ &= \frac{2,700,000,000x[.75]}{36500} \\ &= \frac{2,025,000,000}{36500} \\ &= RM\ 55,479.45 \end{aligned}$$

So, on day 91, Bank Muamalat would have to return an amount of RM 5,055,479.45 to Ambank Islamic, being the principal plus profit due.

Appendix 2

Common IIMM instruments and their underlying Islamic contracts.

i) Government Investment Issue (GII)

To meet the need for a liquidity management instrument that is also shari'ah compliant, the Malaysian Parliament passed the Government Investment Act in 1983. This act, enabled the Malaysian government to issue a non-interest bearing money market instrument, known as Government Investment Certificates (GIC) {now replaced with Government Investment Issues (GII)}. The GII was introduced in July 1983 under the concept of *Qard al- Hasan*.

Since a *Qard al- Hasan*, based instrument would not have a predetermined fixed “face value” at maturity, it would not be suited for secondary market trading . Thus, beginning with a 15 June 2001, issue, GII's are now issued under a new concept of *Bai Al-Inah*. This, added depth and liquidity to the IIMM as the GII is now tradable in the secondary market via the concept of *Bay ad- Dayn* (debt trading).

ii) Bank Negara Negotiable Notes (BNNN)

Bank Negara Negotiable Notes (BNNN) are a short-term, money market instrument issued by BNM. The underlying contract is that of *Bai Al Inah*. First introduced to the IIMM on 29 November 2000, It is now popularly traded in the secondary market. The price of the BNNN is determined on a discounted basis. Tenor is typically up to one year. The BNNN is designed as a liquidity management tool .

iii) Cagamas Mudharabah Bonds (*Sukuk Mudarabah Cagamas*)

The Cagamas *Mudharabah* Bond, was introduced in March 1994 by Cagamas Berhad, the National Mortgage Corporation, to finance the purchase of Islamic housing debts from financial institutions. As the name suggests, the bond is structured using the concept of *Mudharabah*. Bondholders and Cagamas will share the profits accrued according to the predetermined profit-sharing ratios.

iv) Islamic Accepted Bills (IAB)

The Islamic Accepted Bill (IAB), was introduced in 1991. The objective was to provide a shari'ah compliant instrument to conventional BAs, particularly for trade financing . The IAB is formulated on the Islamic principles of *Al-Murabahah* (deferred lump-sum sale or cost-plus). The secondary market trading of the instrument is based on *Bai ad-Dayn* (debt-trading).

Murabahah is based on a cost-plus profit margin or mark up agreed to by both parties. *Bai Al-Dayn* refers to the sale of a debt arising from a trade transaction in the form of a deferred payment sale. There are two types of financing under the IAB facility, namely:-

- **Trade Financing/ Imports**

A *Murabahah* based, working capital financing mechanism. The Islamic bank appoints the customer as its purchasing agent for the underlying goods. As agent, the customer purchases the needed goods from the seller (foreign exporter) on behalf of the bank, which pays the seller /exporter and resells the goods to the customer at a marked up price. The customer is typically allowed a deferred payment of up to 200 days. Since, the sale of goods by the bank to the customer on deferred payment constitutes a debt, the debt is securitised in the form of a bill of exchange drawn by the bank on and the customer for the full amount of the selling price. The bank can then decide to sell the IAB to a third party on a *Bai al-dayn* basis.

- **Trade Financing/ Exports**

An exporter, with an approved IAB facility, prepares the export documentation as required under the sale contract or letter of credit. The export documents, shall be sent to the importer's bank. The exporter then draws on the foreign commercial bank a new bill of exchange as a substitute bill and this will be the IAB. The bank shall purchase the IAB at a mutually agreed price using the concept of *Bai al-Dayn* and the proceeds will be credited to the exporter's account.

v) **Islamic Negotiable Instruments (INI)**

These negotiable instruments come in two varieties;

Islamic Negotiable Instruments of Deposit (INID)

Based on the concept of *Al-Mudharabah*. The underlying asset is usually a sum of money deposited with an Islamic banking institution and repayable to the bearer on a specified future date.

ii) Negotiable Islamic Debt Certificate (NIDC)

Involves two steps, first, the sale of an Islamic bank's assets to a customer at an agreed cash price. In the second step, the customer resells the asset to the bank at original sale price plus a profit. The bank will pay the customer this new amount at an agreed future date.

vi) Islamic Private Debt Securities

Islamic Private Debt Securities (IPDS) are essentially shari'ah compliant Corporate bonds. Introduced in 1990, they form the backbone of the Malaysian Islamic Bond market. Most of the IPDS currently outstanding, were issued based on concepts of *Bai Bithaman Ajil*, *Murabahah*, *al Mudharabah* and increasingly *al ijarah*.

vii) Sell and Buy Back Agreement (SBBA)

Essentially a replication of the conventional REPO, the Sell and Buy Back Agreement (SBBA) is an Islamic money market transaction. A bilateral agreement in which an SBBA seller (seller) , first sells assets to an SBBA buyer (Buyer) at an agreed price. Subsequently, both parties enter into a separate agreement in which the buyer promises to sell back the asset to the seller at an agreed price.

viii) The Commodity *Murabahah* Program (CMP)

The Commodity *Murabahah* Program (CMP) is the most recent introduction to the Malaysian IIMM. Introduced in March 2007, it is a commodity based liquidity management tool. The underlying commodity is Crude Palm Oil (CPO) . Under the program, an Islamic bank purchases CPO from a broker and sells it to BNM at cost-plus. BNM agrees to pay the bank the said amount on a deferred basis and appoints the bank as its agent to sell the commodity. The bank then sells the commodity to another broker and credits the amount to BNM. What has effectively happened is that, as a result of this transaction, the bank has placed out its excess funds with BNM. The same transaction can be done in reverse if a bank is short of funds and needs liquidity. The CMP however, is not currently available in the secondary market.