

MONETARY POLICY, CAPITAL REQUIREMENT AND LENDING BEHAVIOUR OF ISLAMIC BANKING IN MALAYSIA

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This paper tries to analyze the role of Islamic banks in the transmission of monetary policy and business cycle. This study will only analyse the Islamic banking in Malaysia. Previous studies such as, Keynes (1936) found that money plays an important role to economic growth. Furthermore, Gurley and Shaw (1995) began to redirect attention toward the overall interaction between financial structure and real activity, emphasizing financial intermediation, and particularly the role of financial intermediaries in the credit supply process as opposed to the money supply process. However, Bernanke and Blinder (1988) performed another view that looked into the assets side as a monetary policy channel to influence the economic activities. The changes in the monetary policy channel give an idea to regulate and strengthen the banking industry. Thus, several questions can be highlighted: how do the changes in the monetary policy tools affect the bank lending? If bank lending plays as monetary policy channel, do they affect the other portfolio? Do the current regulations (such as capital requirement) affect the Islamic bank lending? Furthermore, this analysis will be used the Generalize Least Squares approach to estimate the monetary changes toward Islamic banks portfolio. Annual data will be used from the year 1997 until 2004. The number of observations is based on the combination of time series and cross-sectional data, which is known as pooled data. Instead of that, we will use an unbalanced bank-level panel data set for Islamic banks (i.e., two full-pledged Islamic banks and thirteen Islamic windows).

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1. Introduction

There has been long determined and interest on the role of banks in the transmission of monetary policy and business cycle. For example, Keynes (1936) found that money plays an important role to economic growth. Furthermore, Gurley and Shaw (1995) began to redirect attention toward the overall interaction between financial structure and real activity, emphasizing financial intermediation, and particularly the role of financial intermediaries in the *credit supply process* as opposed to the money supply process.³

However, Bernanke and Blinder (1988) produced another view that looked into the assets side as a monetary policy channel to influence the economic activities. For example, in a monetary contraction, banks' reserves decrease because of reserve requirements and hence reduce the deposits. Consequently, it may increase the short-term and long-term interest rate and also reduce the supply of bank loans. If bank-dependent borrowers are dominant, thus it will reduce the investments and thereby in economic activity. Besides that, according to balance sheet channel Bernanke and Gertler (1989), monetary policy can affect a borrower's financial position or net worth, thereby influencing the costs of external finance to the borrower (arising from the loss of creditworthiness). Consequently, effects the borrowers' investment and spending plan.

However, the recent studies made by Altunbas, Fazylov, and Molyneux (2002) found that across the EMU systems, undercapitalized banks (of any size) tend to respond more to change in monetary policy. Furthermore, Huang (2003) analysed the cross-section differences between bank-dependent and non-bank-dependent listed companies and between listed and non-listed companies. Their results concluded that small firms bear most of the reductions in bank loan supplies, and since they do not have many alternatives to bank finance, they suffer more from monetary tightening than big firms. Furthermore, he found that big,

³ Several important papers that supported this idea are Kuh and Meyer (1963), Tobin and Dolde (1963) Brainard and Tobin (1963), Minsky (1975) and Kindleberger (1978), Tobin (1975)

non-bank-dependent firms can benefit more from the bank-firm relationship than small, bank-dependent firms.

The changes in the monetary policy channel give an idea to regulate and strengthen the banking industry. Thus, several questions can be highlighted: how do the changes in the monetary policy tools affect the bank lending? If bank lending plays as monetary policy channel, do they affect the other portfolio? Do the current regulations (such as capital requirement) affect the bank lending? Furthermore, we used disaggregated data in order to analyze the response of bank lending in combination with other hypothesis that we mentioned above similar as theoretical literature. Thus, we hope this paper could be contributed to the policy makers for making a good policy in order to stabilize the economy condition as well as banking industry. Therefore, the objective of this paper is to analyze bank lending channel as one of the important transmission mechanism of monetary policy. We also want to examine whether deregulation can produce a counteract affect on the bank supply of loans (assets side).

The organisation of this paper is as follows. Section 2 discusses the stylized facts about monetary policy in Malaysia. Section 3 gives an overview of the Malaysian Islamic banking industry. In section 4, indicates recent literature on monetary transmission and bank lending. Then, section 5 we develop our methodology. Section 6 we present our empirical results. Ultimately, section 7 concludes.

2. The Stylized Facts about Monetary Policy in Malaysia

Bank Negara Malaysia reported that, prior to the mid 1990s; monetary strategy in Malaysia was targeting monetary aggregates. This was an internal strategy and was not formally announced to the public. The establishment of this strategy was based on the evidences that monetary aggregates were closely linked to the ultimate objectives of monetary policy. There was prove by the correlation test that is, monetary growth (M3) shown to be positively and highly correlated with inflation by using quarterly data from 1980-1992. The ultimate objective of monetary policy is to stabilize the price and seen as a suitable target for policy. Prior to 1987, M1 was the main policy target. However, Bank

Negara Malaysia (BNM) eventually placed greater importance on the broad monetary aggregate, M3 as the policy target because of the financial liberalization and innovation.

However, further developments in the economy and the financial system during the early 1990s weakened this relationship and highlighted the problems associated with using monetary aggregates as policy targets. There had been large capital inflows in 1992-93 brought to the instability of the monetary aggregates as targets. The annual growth of money supply, as measured by M3 was extremely volatile during the period of large capital flows. Consequently, BNM had shifted the monetary policy strategy from monetary aggregates to interest rates as the intermediate target. There are four mainly factors that influenced the changes of the monetary policy. Firstly, the liberalization of interest rates since 1978, led to a more market-oriented interest rate determination process.

Secondly, financial deregulation and liberalization measures undertaken during the decade had enhanced the role of interest rate in the monetary transmission mechanism. Thirdly, there was a notable shift in the financing pattern of the economy since the mid-1980s following structural changes in the economy from an interest inelastic market (Government securities market) to a more interest sensitive market (bank credit and capital market). Ultimately, BNM also concentrates on the view that needed stability of interest rate in order to promote a stable financial system which will contribute towards a more effective transmission mechanism of monetary policy. Though given this economic environment investor becomes increasingly more interest-sensitive.

In this monetary policy strategy, we can see the evolution of interest rate regime from 1990 until present. Prior to 1991 the deposit and lending rates subject to administrative control of BNM. However, in February 1991 the policy has been changed that banking institutions free to determine deposit and lending rates. In this policy BNM had developed standardized BLR formula derived based on individual institution's cost of funds. Besides that, margin above BLR capped at 4 percentage points. Furthermore, in November 1995 another changes in interest rate regime that is, developed market-based BLR framework incorporating standardized formula for computation of maximum BLR for industry. Maximum BLR computed based on weighted average of 3-month

interbank rate and administrative margin of 2.5 percentage points. However, maximum margin above BLR remained at 4 percentage points. In the September 1998, BNM had substitute interbank rate with BNM intervention rate. Administrative margin reduced to 2.25 percentage points. However, maximum margin above BLR lowered to 2.5 percentage points. The intervention rate was used as a basis to compute the ceiling BLR as it is the market rate at which banking institutions can borrow from BNM at times when the market is short of liquidity.

Ultimately, recently, in April 26 2004 BNM has implemented the new interest rates framework. Under this new framework, the overnight policy rate (OPR) replaced the three-month intervention rate. The OPR was set at the prevailing interbank overnight rate of 2.7% and allowed to fluctuate within a narrow range of plus or minus 25 basis points. Banking institutions could then fix their cost structures and business strategies.

Furthermore, another characteristic of the monetary policy is the transition towards a more market-based policy procedure. This strategy is to enhance the effectiveness of monetary policy in the medium to long run. BNM has accomplished on a three pronged strategy to facilitate this transition process. There are, namely enhancing transparency, improving the payment and settlement arrangements and accelerating regulatory and prudential reforms. During the financial crisis in mid 1997, there had been effects on financial and economic activities. In that period there was extremely volatility in financial markets. The well built initial conditions and the prompt response and pragmatic measures introduced allowed Malaysia to avoid the extreme effects of the crisis. In order to ensure the payments system and the intermediation function continued to operate efficiently and without interruption there had been given the priority to the policy.

However, the policy responses to the crisis evolved with the difference stages of the financial crisis as circumstances changed. Since the crisis became more long lasting and faced with severe economic contraction on September 1 1998, BNM took the pre-emptive step to introduce selective exchange controls to contain the internalization of the ringgit and to stabilize short-term capital flows. On September 16, BNM reduced the SRR to 4%. Furthermore, BNM also make reductions on the intervention rate in three successive steps to 7% per annum in November continued until August 1999 the policy rate was reduced to 5.5% per annum. As a result of the aggressive easing monetary policy, the average

BLR or commercial banks and finance companies fell from 11.7% and 14.7% per annum repetitively in August 1998 to lows 6.79% and 7.95% per annum by August 1999.

Subsequently, in order to support the economy recovery, the rapid easing of monetary policy following the introduction of the exchange control measures has been the best action to provide an environment of low interest rates and ample liquidity. In addition, in the globalize economy, monetary policy would be conducted more and more through market-based instruments. The monetary policy framework would be adapted accordingly to ensure that monetary policy remains an effective policy instrument in order to promote economic growth and maintaining monetary stability.

The government is heavily involved in financial markets. Most recently, it forced the 58 domestic banks to merge into 10 larger financial institutions, after which it recapitalized these institutions and restructured their extensive non-performing loans through the national asset management company, Pengurusan Danaharta Nasional Berhad. In 2001, the Bank Negara Malaysia (the central bank) announced a 10-year plan for strengthening the financial sector that blocks competition from new foreign banks until after 2007. Overall, foreign participation in commercial banking is limited to 30 percent of equity in any single institution.

3. The Malaysian Islamic Banking Industry

There had been many changes in banking performance since the Asian crisis; during the crisis the Malaysian banking sector faced the disruption of liquidity, capital and performance. Many banks had been merged and acquired in order to recover their losses in crisis. However, up to recent years total Malaysian commercial banks in Malaysia are 25, that is out of 2 fully pledged Islamic banks and others domestic and foreign commercial banks. Islamic banking activities in Malaysia are undertaken by Bank Islam Malaysia Berhad (BIMB) and Bank Muamalat and 20 other financial institutions there are 13 commercial banks, 2 finance companies and 5 merchant banks.

There are many factors influence the Islamic banking in Malaysia in previous history. An establishment of first Islamic bank that is Dubai Islamic Bank in Dubai U.A.E in the year 1975 was an external factor

that gives an idea to establish Islamic banking in Malaysia. Furthermore, the rapid development of Islamic financial institutions in Sudan, Pakistan and Iran also implement banking system to Islamic banking system. The successful of establishment Islamic banking in Malaysia supported by development of the financial market and others financial intermediation in Islamic perspective. For example, there are Islamic Capital Market, Islamic Capital Equity, Islamic International Financial Market, Association of Islamic Banking Institutions in Malaysia, Islamic Banking and Finance Institute Malaysia and Takaful companies.

An increase in cooperation and commitment between Islamic nations is needed in order to perceive strengthen and comprehensive growth in Islamic banking industry. Besides that, contribution and participation from Islamic nations also needed to correlate the gap between Islamic nations in Islamic banking industry growth in their nations. In order to upward Islamic financial become more transparent in their consistency of goods and services needed.

4. Prior Studies

The role of bank as a transmission of monetary policy can be seen from both assets and liabilities. Money channel tries to highlight an important role of banks in order to generate the liabilities. Bank expands their money through the deposits and placements earning from customers, banks and other financial institutions. Ford et al. (2003) examined that monetary contraction, reduces the banks' reserves, owing to reserve requirement. Then, ability of banks to increase their deposits is constrained. Consequently, depositors hold less money (bank deposits) in their portfolios.

The role of banks in the transmission of monetary policy emanates also from their assets. Loans is the main banks' asset, thus monetary policy action will also influence the variables. The transmission of the monetary policy on the bank lending have been classified into two wide views which is traditional *money view* and *credit view* which affects the aggregate demand and thus the output.

The influence of monetary shocks on real economic activity has two dimensions in the credit view that is the borrower net worth channel (also known as the balance sheet channel) and the bank-lending channel. First, a monetary shock can influence the financial position of a borrower firm. A higher net worth of a firm's balance sheet makes external financing from loan market possible and hence, stimulates investment decisions. As the transmission of monetary shocks to the real economy occurs through the borrower's balance sheets, this channel is called the *balance sheet channel (loan demand)*. Second, monetary shock can also influence the bank's loan supply to bank dependent firms. This change in the availability of loans influences the investment decisions of the borrower firms by reducing external source of finance. The transmission through such a channel is called the *bank-lending channel (loan supply)*. However our research will only concentrate on the bank-lending channel as a mechanism transmission in monetary policy.

The approach to the monetary transmission mechanism appears to be an important channel of credit view as there are bank dependent borrowers who have few or no alternative sources of finance other than bank loans. Any frictions in the asset-liability management of banks due to monetary shocks would be transmitted to real economic activity through bank dependent producers in the economy. A tight monetary drains reserves from the banking system and restrict the supply of loanable funds so that it increases the external finance premium of bank dependent borrower firms. In other words, in this channel, Kishan and Opiela (2000) conclude that asymmetric information and time deposits purchasers expose these purchasers to the default risk through the non-reservable, uninsured deposits (that is, time deposits). Consequently, inducing of reserves by central banks may affect some banks unable to completely offset with an increase in time deposits. This implies that open market operations can directly affect loan supply and create an additional channel of monetary transmission.

The effect of a monetary shock on the external finance premium of small size firms is assumed to be higher than it on large ones under the assumptions that large size firms have easier access to the credit markets and have more alternative sources of finance. Kakes and Sturm (2002)

use quarterly data of six different banking groups in the German and conclude that lending by the credit co-operatives, which are on average the smallest banks, declines most, whereas big banks are able to shield their loans portfolio against monetary shocks. This shows that the response of bank lending after a monetary contraction is very different across banking sectors.

Besides that, Kashyap and Stein (1995, 2000) analysed disaggregated data of banks and find that large banks are better able to neutralize monetary shocks than small banks. Small banks face more credit market imperfections and have only limited access to alternative sources of finance, so that they cannot absorb monetary shocks as easy as larger banks. The presence of an active bank-lending channel may serve to explain the amplified and propagated conventional effects of policy shocks. It has been noted that since bank lending channel focuses only on the lending behaviour of banks affected by monetary policy shocks, this transmission channel view is assumed to be narrow typed credit channel approach. Kashyap and Stein (1995) use micro data on bank balance sheet to identify effects of monetary policy on bank lending. They divide banks into size categories and look at the response of lending to monetary policy shocks, which they identify as changes in the federal funds rate. They find that bank lending declines after a monetary policy contraction at all but the largest banks. They interpret this as evidence supporting existence of a bank-lending channel since one of the links in the chain of causality behind the bank-lending channel is that after a monetary contraction, bank lends less. These findings are similar with the research made by Huang (2003), which using balance sheet data for a panel of UK listed firms.

However their result is consistent with a fall in credit demand of small bank borrowers relative to large bank borrowers (consistent with the Oliver and Rude Busch (1995) criticism of Kashyap, Stein and Wilcox (1993)). Kashyap and Stein (1995) do not look at the next step in the chain of causality to see whether the differential response of small and large banks to monetary shocks has effect on the real economy.

However other researchers have studied the effects of the monetary transmission on the bank size and their behaviour towards lending. In

addition, these studies also investigate whether monetary policy has a differential impact for banks of: different asset size (Kasha and Stein (1995), asset size and liquidity (Kasha and Stein 1997a) and asset size and capital strength (Kishan and Opiela 2000). These studies find that a bank-lending channel exists and this is mainly transmitted through small banks. The bank-lending channel also appears to be strengthened when these small banks are either relatively illiquid or undercapitalized. In short, the evidence strongly suggests that a bank lending channel is present for small balance sheet constrained banks. The use of banks' size as a measure to generate cross-sectional differences does not correspond precisely to the underlying theoretical models, which stress the importance of net worth. In this context, banks' capital may be a better proxy. Favero et al (1999) and Kishan and Opiela (2000), categorized banks by size into six asset size categories and further subdivided into three capital strength groups.

Though regulators use a variety of definitions of bank capital, they focus on the equity capital ratio to total asset ratio (Benston, 1998 and Estrella et al.1999). This includes bank with equity to asset ratios with: < 5% (undercapitalized), > 5% and <10% (adequately capitalized) and > 10% (well/over capitalized).

The asset size of each bank there is a significant inverse relationship between bank lending and changes in money market rates for undercapitalized small, medium and large banks across eleven EMU countries. In the case of small and large bank relationship is contemporaneous whereas for medium sized banks there is a significant lagged relationship as they probably are better insulated from monetary policy shock. It seems that bank-lending channel is more prevalent for undercapitalized banks operating in the other smaller EMU countries.

As such evidences of a bank-lending channel in the EMU are mainly transmitted through undercapitalized banks operating in the smaller banking systems. They indeed find that the lending behaviour of small-undercapitalized US banks (those with less than RM300 million in assets) is most responsive to monetary policy. Peek and Rosengren (1992) analyze the lending behaviour of New England banks over the

1990-1991 recessions. Their results indicate that the loans of well-capitalized banks fell by less than the loans of poorly capitalized banks. Hence, as with the Kashyap and Stein findings, their evidence suggest there are effects on informational imperfections in financial markets on the balance sheets of intermediaries as well as borrowers. Debondt (1998) was the first to use disaggregated bank data to test for evidence of the lending channel across various European countries, following a similar approach to Kashyap and Stein (1995, 1997a). Debondt (1998) also tests European banks with varying characteristics (in term of balance sheet size and liquidity) respond to the changes in the stance of monetary policy (short term interest rates) during the 1990-1995 periods in order to examine whether there exists important differences. In his interactive regression models, he uses changes in money market rates (as a proxy for monetary policy stance).

Overall, the evidence shows there are exists bank lending channel in Germany, Belgium and the Netherlands, while the rest of countries under study (France, Italy and the United Kingdom) no significant effect were found. However, when the stance of monetary policy is measured by a monetary condition index, the bank-lending channel also appears to exist in Italy and France. In 1999 he adopts a different approach by using aggregate bank data to examine the main lending channel in the same six European countries. By including security holdings in a vector error correction model as a variable used to detect loan supply effects he finds evidence that credit constraints due to monetary policy are important in Italy, Germany and France, but not in the United Kingdom, Belgium and Netherlands.

Furthermore, Altunbas, Fazylov and Molyneux (2002) by using panel data approach, find that EMU systems, undercapitalized bank (of any size) find to respond more to change in policy. It seems that the bank-lending channel is more prevalent for undercapitalized banks. However, Favero (1999) use individual bank balance sheet data to investigate the response of banks in France, Germany, Italy and Spain to monetary tightening during 1992. They find no evidence of bank lending channel although they do find that banks in different countries respond in different ways to protect the supply of loans from liquidity squeeze.

In other perspectives, bank lending is also exposed to GDP shocks. This is because demand for loans is pro-cyclical. However, banks' lending supply could behave differently according to the business cycle. According to Boot 2000 and Thakor 2004 the reason is that banks deeply involved in relationship lending are likely to smooth lending 'through the cycle'. Though, well-capitalized banks could be in a better position to absorb temporary financial difficulties on the part of their borrowers. Besides that, many previous literatures have emphasized the relationship between bank capital and risk aversion (Rochet, 1992; Hellman et.al). This means, if banks choose ex ante a loan portfolio with higher return and risk, so their borrowers are on average, more financially fragile and more exposed to economic downturns.

These could highly debate an important issue that how bank capital influence the response of bank lending to monetary policy and GDP shocks. Gambacorta and Mistrulli (2004) find that well-capitalized bank are less constrained by capital requirements and have more opportunities to expand their loan portfolio. Furthermore, the results show that the response of bank lending to a monetary policy has the expected negative sign. The findings also show that the effects of a monetary tightening are smaller for banks with higher capital ratios, which have easier access to uninsured financing. Their findings also show that there has been positive correlation between credit and output. An increase in output causes a loan increases. The interaction term between GDP and excess capital is negative. This means that the credit supply of well-capitalized banks is less dependent on the business cycle. This is consistent with Kwan and Eisenbeis (1997), where capital is found to have a significantly negative effect on credit risk.

5. Methodology

5.1. The Model

In this section, we adopt an approach similar to Kashyap and Stein (1995), Kishan and Opiela (2000). Though, we try to examine evidence of the bank-lending channel in Malaysia. In particular, we examine evidence of the lending channel for the commercial banks in Malaysia between 1994 and 2004. According to *bank lending channel* theory, the

central point in the issue of procyclical behaviour of banks is the passing through of lending into the macroeconomic sphere similar to that of Bernanke and Blinder 1992. Therefore, this section briefly discusses the extent to which lending depends on either demand or supply variables. Naturally, there is a strong correlation between demand for credit and the business cycle. The model developed below is estimated using the random effects panel data approach. This is set out as follows, with index i referring to bank i and t to period t . Our empirical model for lending is given as:

$$Lending_{it} = \alpha_1 GDP_{it} + \alpha_2 unemployment_{it} + \alpha_3 M3_{it} + \alpha_4 interbank\ rate_{it} + \alpha_5 profits_{it} + \alpha_6 non-deposit_{it} + \alpha_7 Islamic\ banking\ fund_{it} + \mu_i \quad (1)$$

The explanation of the above variables is as follows:

a. Macroeconomic factors

(i) *Real GDP growth* The GDP growth figure is the most general and most direct measure of macroeconomic developments. In our context, it is first and foremost an indicator of the demand for banking services, including the extension of loans, and the supply of funds, such as deposits, and as such is a direct determinant of profits. As a growth figure, it is the single most useful indicator of the business cycle, while the costs of banks are also expected to be linked to the GDP cycle. The GDP growth figure is made real by deflating it with GDP inflation.

(ii) *Unemployment (%)* Unemployment does not directly influence profitability, but it is a major cyclical indicator. If short-term unemployment is primarily a reflection of the business cycle, long-term unemployment especially indicates structural disequilibrium in the economy. In addition, unemployment is a measure of the current *phase* in the business cycle, whereas a figure like GDP growth merely indicates the *degree of change* in the business cycle.

(iii) *Real money supply (M3; % change)* The money supply is represented by the monetary aggregate M3, defined as the sum of cash and non-cash balances held by the public, short-term deposits, foreign-exchange holdings and short-term savings. Growth of the money supply makes real growth possible, and is primarily an indicator of future growth potential (see Boeschoten *et al.*, 1994; Berk and Bikker, 1995).

In the first place, it reflects the availability of money, which is strongly linked to the creation of money by banks through lending. Excessive money growth implies a risk of overheating the economy and its concomitant, rising inflation. The ECB therefore regards excessive M3 growth as a preamble to rising inflation. The impact of money supply on profits is mostly indirect, which is why this variable, too, functions mostly as a *control* variable. Like real GDP, the real money supply is deflated by GDP price increase.

(iv) *Islamic Interbank rate*. The three-month Klibor is determined by the supply of and demand of funds by financial institutions in the interbank market, the largest lender being Bank Negara Malaysia. The central bank can influence the interbank rates through its open market operations by borrowing from and lending to the financial institutions. According to Affin-OUB Research, the drop in the three-month Klibor reflects a change in the central bank's open market operation and does not signal a change in monetary policy or an impending spike in the statutory reserve requirement (SRR) of banks. In a recent report, the research house said now that the three-month Klibor is more market-determined than before, the financial instrument is expected to display a greater degree of volatility. A head of research from a stockbroker said Bank Negara, by making a shift from the three-month Klibor to the shorter-end one-month Klibor, hopes to encourage banks to lend more among themselves, indirectly boosting loan growth, which has stagnated because banks are unable to find good borrowers.

b. Banking sector specific factors

(i) *Loans (as a share of total assets)*. This variable represents the (relative) size of lending. Generally speaking, loans have a positive influence on profitability, because as a bank's core business, they are a major generator of interest income. But lending also entails operational costs and credit losses. If costs and risks are not expressed adequately in the price of credit (*i.e.* the mark-up rate), for instance, as a result of cross subsidization, then lending becomes a loss-making business. In any case, this variable serves to characterize a bank's balance sheet. Like the variables that follow below, the loans variable is divided by total assets

in order to standardize it and allow comparisons across countries and years.

(ii) *Capital and reserves or Islamic banking fund (as a share of balance sheet total)* this includes paid-up capital, reserved funds, retained profits and other capital funds. Generally speaking, capital and reserves constitute the “own funds” or core capital of a bank and—as an item in the balance sheet total— its solvency. The more risk investments carry; the more capital is needed, so that the coefficient may become negative. While high-risk investments bring in more returns, greater capital could go together with high profits, so that a positive coefficient may be expected as well, depending on the degree to which risk pays off. If profits are defined as *returns on equity*, then a relatively small capital may leverage high profits, and one should expect to see a negative coefficient. If profits are defined as the margin on assets, capital and reserves become a “free” source of finance, so that from this perspective, one must expect a positive coefficient. Thus, on account of the many possible ways they may pass through to the results, the capital and reserves variable is primarily a *control* variable.

(iii) *Non-bank deposits (as a share of balance sheet total)* Non-bank deposits include all deposit liabilities of banks except interbank deposits. This variable characterizes the funding structure of the banking system.

5.2. Estimation Methods

To verify whether the sample data is normally distributed, the data will be tested using several techniques such as the skewness test, kurtosis, the Jarque bera as well as the value of mean and median. If a sample is normally distributed, then the value of skewness will be equal to zero, the value of kurtosis should be three and the value of mean should be the same as the value of its median while the value of Jarque bera should not be significant or with high value of probability. A sample data that is normally distributed should be an efficient estimator, unbiased and consistent. If the sample data is not normally distributed, i.e., the value of mean and median for all the variables are not the same while their skewness is not equal to zero. The values of kurtosis are not equal to three and the values of Jarque-Bera are significant. Therefore it can be

concluded that based on the above, the Ordinary Least Squares estimation method is not a better estimation method to be used. Hence, the Generalize Least Square method is more appropriate and expected to yield a much better result.

The standard unit root test has to be performed first to check the stationarity of our data. However, it is often argued that the commonly used unit root tests such as the augmented Dickey-Fuller test and the Phillips-Perron test are not very powerful. As a response, panel unit root tests are developed. These tests are in essence motivated to increase the power through pooling information across units. In order to adopt the appropriate panel estimator we used Hausman test statistic to compare random effects with the fixed effects model. In all the estimations outlined in our paper the fixed effects was the preferred model.

5.3. Data

To estimate equation (1), we use an unbalanced bank-level panel data set for 15 Islamic banking. The data are annual and span the period from 1997 to 2004. The total number of observations in the sample is 105 samples. Before we can estimate the equation, the number of degrees of freedom (df) should be taking into account.⁴ In this manner a full cycle of the Malaysia economy is included, a point of particular importance given that the aim of this paper is, as mentioned, to analyse whether there is a relationship between the business cycle, lending, monetary policy and regulatory framework.

6. Results

Our first step of estimation is to test the unit root test for each pool data. From the equation we developed there are ten variables to be estimated. Below are the results for the stationary test. From the unit root test we specified them into individual process and common process. Which is,

⁴ The term number of degrees of freedom means the total number of observations in the sample ($= n$) less the number of independent (linear) constraints or restrictions put on them. In other words, for the k variable model it will have $n - k$ df. The general rule is this: $df = n - \text{number of parameters estimated}$.

common test indicates that the tests are estimated assuming a common AR structure for all the series. While the individual test is used for test which is allow for different AR coefficients in each series.

According to table 1, our results show that all variables are significant at level stage for unit root test that is loan ratio, non-deposit ratio, Islamic banking fund ratio, profit, three month Islamic interbank rate, GDP deflator, unemployment rate and monetary growth M3. This stationary test only to prove the stationarity of time series pooled data. However, our next estimation GLS will be regressed all the variables and if any spurious of the data will be checked by the value of the r-adjusted squared and Durbin Watson.

Table 1: Stationary Test (Level)

Variables	Individual unit root process			Common unit root process	
	Im, Pesaran and Shin W-stat	ADF-Fisher Chi square	PP-Fisher Chi-square	Levin, Lin &Chu t*	Breitung tstat Loan/Asset
Loan/Asset	-0.15853 (0.4370)	40.0966 (0.0382)**	34.2536 (0.1288)	-3.43016 (0.0003)*	-0.09689 (0.4614)
NDeposit/Asset	-1.41856 (0.0780)***	46.1395 (0.0301)**	41.7653 (0.0750)***	-7.36785 (0.0000)*	0.23061 (0.5912)
Islamic Banking Fund/Asset	-3.57870 (0.0002)*	73.3546 (0.0000)*	85.6645 (0.0000)*	-11.7104 (0.0000)*	-1.55617 (0.0598)***
Profit	2.20304 (0.9862)	8.97362 (0.7415)	54.1381 (0.0010)*	-6.47672 (0.0000)*	0.24174 (0.5955)
Threem	0.56571 (0.56571)	276.310 (0.9388)	277.571 (0.0000)*	63.4629 (1.0000)	-7.58172 (0.0000)*
GDP Deflator	5.86630 (1.0000)	0.61430 (1.0000)	5.23076 (1.0000)	9.43273 (1.0000)	-13.9636 (0.0000)*
Unemployment	-6.33779 (0.0282)**	106.173 (0.0000)*	138.951 (0.0000)*	-15.2838 (0.0000)*	-0.21374 (0.4154)
Growth of Money M3	1.39428 (0.9184)	11.7673 (0.9988)	12.8452 (0.9974)	-1.66406 (0.0481)**	-6.80427 (0.0000)*

Note: *, ** and *** indicate significance at the 1%, 5% and 10% levels, respectively.

The probability values are in the parenthesis, while others are t statistics. Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Table 2: Descriptive Analysis

	Loan / Asset	Non-deposit / Asset	Islamic Banking Fund / Asset	Profit	Three month	GDP Deflator	Unemployment	Growth of money M3
Mean	0.371947	0.615843	0.085237	38024.63	3.414524	100.7120	3.445238	6.795795
Median	0.368199	0.697295	0.054866	12778.00	3.000000	1000.000	3.475000	6.731682
Maximum	0.980508	0.962901	0.944599	11631.88	6.200000	110.6930	3.675000	12.36965
Minimum	0.000000	0.001536	0.006867	-9010.000	2.820000	95.35120	3.100000	2.725089
Std. Dev.	0.289997	0.249719	0.111360	127901.5	1.147591	5.131638	0.195602	3.380903
Skewness	0.344773	-0.703559	5.710295	8.255786	2.014448	0.777544	-0.645099	0.242924
Kurtosis	2.034722	2.462371	43.5492	73.03800	5.10856	2.491657	2.035944	1.787350
Jarque-Bera	4.925320	7.941580	6211.337	18122.84	72.37314	9.368494	9.079046	5.972994
Probability	0.085208	0.018859	0.000000	0.000000	0.000000	0.009240	0.010678	0.050464

Table 3: The Responsive of Total Loan to Changes in Monetary Policy. Generalize Least Squares (Fixed Effect)

Dependent variables / Independent variables	Loan
Deposit	-1.249605 (-2.158924)**
Islamic banking fund	-0.280015 (-1.419742)
Profit	-1.86E-07 (-1.193229)
Three month (Lag 1)	-0.055077 (-2.701674)*
GDP deflator	0.026109 (3.113471)*
Unemployment (Lag 1)	-0.158200 (-1.125003)
M3(Lag 1)	-0.023938 (-1.940615)***
Constant	-2.36E+08(-2.280945)**
Adjusted R-squared	0.750988
DurbinWatson	2.258983
F-statistic	11.19654

Note: *,** and *** indicate significance at the 1%, 5% and 10% levels, respectively. The t-statistics are in the parenthesis, while others are coefficient values.

As we mentioned earlier, that from the descriptive analysis as shown in table 2 we could know the distribution of the samples data. From our analysis we found that the mean and median value is not equal for each variable tested. Furthermore, the skewness value mostly is not equal to zero, for example; non-deposit and loan are -0.703559 and 0.344773 respectively. Instead of that, from our analysis we found that the kurtosis value is also **not equal to three. Most of the values are more or less than three. The most important thing in the analysis we proved that all of the probability values are significant. Thus, we**

could conclude that all samples of the data are not normally distributed. Therefore, we indicate that our next estimation is more appropriate by using Generalize Least Squares method rather than Ordinary Least Squares.

Table 3 illustrates the responsiveness of total loans (LOAN) to changes in monetary policy across 15 Islamic banking in Malaysia between 1997 and 2004. Fixed effects model has been chosen as our specification test in order to get more powerful and parsimonious model. This could be statistically significantly revealed by the Hausman specification test that shows correlations of the random effects with the regressors. Though, the fixed effects model would be the model of choice. It can be seen that from the loan equation that bank lending does appear to be statistically significantly related to the changes in the stance of the monetary policy.

The illustration shows that the changes in monetary policy proxy by three-month Islamic inter-bank rate significantly show the effect of changes in total loans. This could be revealed that, whenever increasing 1 percent in inter-bank rate (monetary contraction), it would decrease the total loans to -0.055077 percent. This suggests how the changes in monetary stance would affect the supply of loans, which is consistent with bank lending channel. Besides that, the results also reveal that there is a significant negative relationship between total lending and non-deposit, at coefficient value -1.249605. This suggests that banks' non-deposits decrease in the effect of the monetary stance. However, our test failed to reveal the significance of the capital to total asset. This suggested that the monetary policy would only reflect the lending ratio. Furthermore, the two remaining macro variables, there are output deflator and growth of money statistically significantly proven after the monetary policy. This is suggesting that changes in monetary policy could affect the supply of loans in current period, while it increased output immediately at coefficient value 0.026109 and growth of money decreased one year after at coefficient value -0.023938.

7. Conclusions

Following the approach suggested by Kashyap and Stein (1995), Kishan and Opiela (2000) we use bank balance sheet to estimate the response of bank lending to changes in monetary policy stance between 1997 and

2004. From our estimations we found there is evidence on the bank lending channel in the case Islamic bank in Malaysia. This means that any changes in monetary policy for example changed in Islamic inter-bank rate in last year would affect supply of loans in current year.

Policy implication that could be concluded from this paper is we find that there exists a bank lending channel in the case of Malaysia. This means that our monetary policy not only could affect the liabilities side but also the assets side. Thus, as policy makers they can use the monetary policy in order to change the supply of loans to overcome the recession and inflation in the economy. Instead of that we could keep in mind that monetary policy not only could be regulated by money as intermediation targets but also as interest rate.

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