Development Impact of Non-Bank Financial Intermediaries on Economic Growth in Malaysia: An Empirical Investigation

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Abstract

This paper aims to empirically examine the development impact of Non-Bank Financial Intermediaries on economic growth in Malaysia using time series data over the period spanning 1974 to 2004. The study employs bounds testing approach to cointegration and error correction mechanism to investigate the existence of a long run equilibrium relationship between NBFIs and economic growth. The study finds evidence of a long run cointegrating relationship between NBFIs and real per capita income. The empirical results indicate that the development of NBFIs positively and significantly influences per capita income in Malaysia. In addition, the CUSUM and CUSUMSQ tests confirm the stability of the model.

JEL Classification: C3, C22, C51, G2.

Key Words: Non-bank financial intermediaries, bounds testing approach, cointegration, Malaysia.

1.0 INTRODUCTION

It is well acknowledged in the academic literature that an efficient and well-developed financial system is important for influencing economic growth. The positive effects of financial development on growth are basically credited to the functions[1] it plays particularly in the mobilization and allocation of resources needed to undertake productive investment activities by various economic agents. Theoretical literature argued that the increased availability of financial instruments and institutions greatly reduces transaction and information costs in economy which in turn influences savings rate, investment decisions and undertaking of technological innovations. A large number of empirical works (e.g., King and Levine, 1993; Levine, 1997, 2003; Neusser and Kugler, 1998; Beck, Levine, and Loayza 2000; Abma and Fase, 2003; Luintel and Khan, 1999; Odedokun, 1996; Rioja and Valev, 2004 etc.) have also tested the finance-growth relationship employing different methodological techniques using different indicators of financial development in cross-country or time series studies. The empirical findings are generally in consensus that a well-functioning and efficient financial system has beneficial impacts on economic growth.

Most of the existing studies have focused on either banking sector development or stock market development. These two sectors of the financial system have been used in the finance-growth nexus literature as proxy for financial development. The emergence of Non-bank financial intermediaries (henceforth NBFIs) as one of the important sub-sectors in the financial system development and hence their relationship with economic activity is largely ignored. Empirically, the association between the development of NBFIs and economic growth has not been examined adequately. Although in recent, there have been some studies (e.g., Impavido and Musalem, 2000; Impavido, Musalem and Tressel, 2003; Harichandra and Thangavelu, 2004; Devis and Hu, 2004 etc.) attempted to examine the association between NBFIs and economic growth, they mainly focused on the developed economies (e.g., OECD) and concentrated disproportionately on the contractual savings (pension and insurance funds) or only on the pension funds. This is despite the fact that in many rapidly growing economies, the NBFIs in various forms have also been seen fast-expanding to compliment the services of the financial system.

[1] For details of the financial functions, see Levine (1997)

This is particularly true for the case of Malaysia where the financial landscape has been observed reshaping faster in concomitant with economic progress over the past three decades. The banking sector in Malaysia is by far the largest component in the financial system and plays the predominant role in providing financial sources to the economy. Like banking institutions, the NBFIs as a group and other financial markets have also gone through a massive expansion process. The NBFIs and other financial markets as alternative sources of financial services have been seen expanding rapidly and gaining importance due to their ability to meet the diverse financial requirements of the economic agents of the country. At the earlier stage of development particularly in the 1950s, there were a few numbers of NBFIs in Malaysia. Along with rapid expansion of economic activities, the number of NBFIs has also increased substantially to include a large number of individual institutions in the list. The resulting effect has witnessed the NBFIs achieved a considerable level of development in the financial system and have rapidly expanded in relation to the size of the Malaysian economy. Most of the NBFIs in Malaysia are developed in concomitant with the expansion of economic activities as to serve the specific purpose in the economy particularly to provide long-term financing for industrialization efforts of the economy. The funds that NBFIs mobilize particularly through contractual savings (provident, pension and insurance funds which are by far the largest component of NBFIs in Malaysia) are mostly of long-term in nature (highly illiquid). On the other hand, the deposits that banking institutions mobilize are mostly of short term (liquid) in nature as their businesses are based on depositors' money.

As such, it is risky for the banks to get involved in long term financing businesses with short termed sources of funds, mismatch of which can jeopardize the macroeconomic stability. The development of NBFIs is of great importance for the development of capital market. A sophisticated and well-developed capital market serves as the backbone of market based economies like the US and the UK whereby the key players are the NBFIs (particularly, pension, provident and insurance institutions; unit trust industries, mortgage and building societies etc.). They play important role in enhancing the health of the capital market by increasing the demand for shares/securities and the level of professional fund management which in turn increase market capitalization, and the value traded relative to GDP (Vittas, 1997). The increasing participation of NBFIs in the development of capital market in Malaysia signifies this. For example in 2004, while banking institutions reduced their holdings of securities (private debt securities and equities) by 11.6 per cent or RM 12.2 billion, the NBFIs (only provident, pension and insurance) increased their investment in securities by 9.7 per cent or RM 23.6 billion (BNM, *AR-2004:*p.104).

The NBFIs in Malaysia also play important role in macroeconomic stability particularly with respect to price stability. This is through the financing of the government's direct development activities that largely come in the form of "captive" savings particularly in the employee provident fund. The funds that the government raises from employee provident fund, insurance fund and also from national savings bank for financing its development efforts are essentially non-inflationary sources which reduce pressure on the economy (BNM, 1994). Rapid expansion of NBFIs can also affect employment growth particularly through expanding small and medium sized enterprises. Small and medium size enterprises normally have limited access to bank credit due to strict collateral requirements against loans. They also face constraints in accessing the capital market. In extending small sized loans, NBFIs on one hand can ease the financial constraints of these enterprises; on the other hand, they can also help to expand business opportunities, which have spill-over effects on creating employment opportunities. With these features of NBFIs development along with the development of banking institutions and financial market, the financial system of Malaysia today has become relatively more matured, sophisticated, broader and better structured which is (on its all fronts) playing crucial role in accelerating the healthy growth of Malaysian economy.

Available data shows that in 1974, the ratio of the financial sectors total resources was 98.4% of GDP and by 2004 this ratio increased to 392.8% of GDP. Within the financial sector, banking sectors' resources accounted for 68.2% of GDP in 1974 which increased to 265.9% as at the end of 2004. The corresponding shares of the NBFIs resources were 30.1% and 126.9% respectively. Similarly, the capital markets[2], which represented a relatively small sub-sector of the Malaysian financial system particularly in the early stages of economic development in the early 1970s, also experienced significant expansion over time. In the capital market, however, the equity market is by far the more active component in Malaysia. Figure 1.1 shows the percentage shares of financial resources of the financial system, banking and non-banking financial institutions with respect to gross domestic product (GDP) in Malaysia for the period 1974-2004.

[2] Capital markets comprise of equity market and bond market. The equity market provides the avenue for corporations to mobilize funds by issuing stocks and shares, while the bond market provides the avenue for the private and public sectors to raise funds by issuing private debt securities and government securities respectively.

Insert Figure 1.1 here

With this brief background, this paper attempts to empirically examine the NBFIs development impact on economic growth using the ARDL approach to cointegration and error correction models (ECM) in the case of Malaysia. Specifically we have two objectives in this study. First, we seek to establish evidence whether there is a long run equilibrium relationship between NBFIs and economic growth. Second, we evaluate whether the development of NBFIs has positive and significant contribution to economic growth in Malaysia. The outline of the rest of this paper is as follows: Section 2 briefly reviews the previous relevant studies. Section 3 specifies the model to be estimated. Section 4 briefly describes the estimation techniques. Section 5 presents the estimation results followed by the stability test in section 6. Section 7 presents the concluding remarks.

2.0 LITERATURE REVIEW

The growth in literature with respect to the relationship between financial development and economic growth has by and large centred on the four broadly categorized hypotheses. They are: no relationship, supply-leading relationship, demand-following relationship and feedback relationship. The most prominent view that no significant relationship exists between financial sectors development and economic growth could be attributed to Lucas (1988) in which he remarked that "the importance of financial factors is very badly over-stressed". With respect to the demand-following hypothesis, Robinson's (1952) argued financial development takes place endogenously in meeting the demand of expanding real economy. In other words, financial development does not influence economic growth. Supply-leading hypothesis originally credited to the works of Schumpeter (1911).

As King and Levine (1993a) pointed out that the services provided by the financial intermediaries –mobilizing savings, evaluating projects, managing risks, monitoring managers, and facilitating transactions are essential for technological innovation and economic development. Thus, Schumpeter's view gives much more importance to the role of financial intermediaries particularly banking system in driving economic growth. However, the modern branch of supply-leading finance theory more pronouncedly starts with the works of McKinnon (1973) and Shaw (1973) which is supported by the majority of the economists. This theory holds that finance significantly and positively influences real sector economy. A large number of empirical works also support that finance influence economic growth. Among those empirical works generally support the hypothesis that finance causes economic growth are King and Levine (1993a, 1993b); Rousseau and Wachtel (1998, 2000, 2003); Neusser and Kugler (1998); Ansari and Ahmed (1998); Levine et al., (2000); Beck et al., (2000); Fase and Abma (2003); Christopoulos and Tsionas (2004); and so on.

The Patrick's (1966) hypothesis, on the other hand, represents the most prominent hypothesis that asserts finance-growth relationship as bidirectional or mutual. This view is found to be consistent with one of the pioneers of development economics (Lewis, 1955) who postulated two-way relationship between financial development and economic growth. The theoretical basis of Patrick's (1966) argument, however, is the stage of development where both supply-leading association and demand-following association are of relevance. Accordingly, at the early stage of development supply-leading association tends to be more influential, while at the matured stage the demand-following association tends to be dominant.

Many theoretical and empirical works suggest that financial development may influence economic growth through some channels such as capital accumulation which is related to the volume of investment and the productivity which is related to the efficiency of investment (e.g., McKinnon, 1973; Shaw, 1973; Galbis, 1977; Pagano, 1993; De Gregorio and Guidotti, 1995; Senhadji, 2000; Beck et al., 2000; Rioja and Valev, 2004 etc). The fundamental intermediary function of the financial system is to mobilize the resources from the savers and make the pooled resources available for investment projects. By doing so, financial system also influences resource allocation and technological innovations. Efficiency in the allocation of resources depends on how well financial system acquires and processes information on the prospective investment project so that the costs involved could be reduced. On the other hand, development of endogenous growth theory focuses much on innovation as an important determinant of economic growth where finance is a crucial factor and hence its role as a driving force of the real economy (Blum, et al., 2002). Thus innovations, capital formation and factor productivity are important mechanisms through which financial system stimulates growth.

Empirically, the two channelling mechanisms (capital accumulation and factor productivity) through which financial development may affect economic growth have been tested in many studies. The results suggest relevance of both channels. For example, Benhabib and Spiegel (2000) examined the relationship between financial development and growth by decomposing into two components (capital accumulation and total factor productivity). Their results suggest that the indicators of financial development contribute to growth through both total factor productivity and physical capital accumulation.

Senhadji (2000), Beck et al., (2000), and De Gregorio and Guidotti (1995) also provided empirical evidence that financial development affects growth mainly through productivity growth. In a recent paper, Rioja and Valev (2004) investigated the channels through which financial development influence economic growth in a panel of 74 countries during 1961-1995. Their investigation provided evidence that finance affects economic growth predominantly through productivity growth in more developed economies while the effect of finance on output growth occurs predominantly through capital accumulation rate in relatively less developed economies. The important point that we observe from the empirical works is that financial development contributes to growth through both channels but the contribution may vary based on a country's relative position of development. Capital accumulation tends to be stronger channel in less developed economies and factor productivity growth is stronger in more developed economies. Apart from banking sector development impact on growth, there are some studies also investigated the impact of stock market development on economic growth. Empirical studies in this line generally suggest a positive linkage between stock market development and economic growth (e.g., Beck and Levine, 2004; Arestis and Demetriades, 1997; Arestis, Demetriades and Luintel, 2001; Rousseau and Wachtel, 2000; Neusser and Kugler, 1998; Levine and Zervos, 1998 etc).

As stated earlier that although in many rapidly growing economies NBFIs forms an important part of the financial sector development, studies on the impact of NBFIs development on economic growth are scant. The lack of adequate focus on the development of NBFIs has thus limited the availability of literature as well as statistical information on this subject. Observations made in the seminal work of Goldsmith (1969) indicate that the financial superstructure tends to expand as economic development proceeds. In other words, the link between financial development and economic growth is reflected in an increasing diversity both in the types of financial intermediaries and in the varieties of instruments in which they specialize. Regarding the evolution of financial structure over time, the view of Gurley and Shaw (1955, 1960, 1973) is prominent. According to their view, at the early stages of development, commercial banks tend to dominate the financial structure. However, as the economies make progress, the share of banks in the total financial assets tends to diminish and a corresponding rise in the share of specialized financial intermediaries (e.g., non-bank institutions such as thrift intermediaries, insurance companies, government and private retirement funds, investment companies, finance companies) and equity markets develop.

Although, the ideas of Goldsmith, Gurley and Shaw are too general which did not provide clarification about the channels through which the newer financial intermediaries may help economy to expand and prosper, they do have theoretical insights and practical implications. The implication is well noted in many developed countries like the U.S., France, U.K, Switzerland and the Netherlands where the importance of non-bank financial intermediaries in different forms such as pension funds, mutual funds and insurance premiums is growing rapidly (Grais and Kantur, 2003). The declining financial intermediary role of commercial banks in the U.S. has been documented since 1920's. Today, NBFIs and financial market play the key role in feeding the economy in the U.S. Similar trend is also observed in the U.K. and France as highlighted in Schmidt and Hackethal (1999). It is estimated that contractual savings mobilized through institutional investors amounted to more than 400 per cent of GDP in the Netherlands, the U.K., and Switzerland in 1997 (Grais and Kantur, 2003).

In a related study, Demirguc-Kunt and Levine (1996) with a statistical data set of 48 countries[3] comprising low-income, middle-income and high-income economies showed graphically how over time the role of NBFIs and stock market grew in importance with banks representing a corresponding smaller share of the overall financial system. The study traced that specialized financial intermediaries and the stock market activities were virtually non-existent at the early stages of development particularly in 1970s. However, by 1990 both non-banks and stock markets began to expand and develop. Their data support Gurley and Shaw's view. The same pattern is observed in the case of middle-income and high-income economies with a higher degree of development of NBFIs and stock markets in the financial system.

Allen and Santomero (2001) examined the changing pattern of financial system's function in allocating resources of economic units with surplus funds to economic units with funding needs over time in the U.S. context. In facilitating the explanation with comparison, they also considered a set of relevant economies like the U.K, France, Germany and Japan.

[3] Comprising 12 low income economies with per capita average GDP US$ 200 in 1970, US$ 430 in 1980 and US$ 490 in 1990; 22 middle income economies with average per capita GDP US$ 510 in 1970, US$ 1980 in 1980 and US$ 2740 in 1990; and 14 high income economies with per capita average GDP US$ 3048 in 1970, US$ 10,61 in 1980 and US$ 20,457 in 1990.

The finding of this study suggests a declining share of assets of banks in the total financial system in the U.S. with a corresponding increase in the share of NBFIs assets in the form of pension funds, trust and investment companies since the 1920's. However, the share of banks' assets to GDP has not declined particularly due to expansion of NBFIs and stock market prosperity. The decline, however, became more vivid after the mid of 1975's favouring the largest share of NBFIs in the U.S. financial system. The finding also indicated that in terms of business lending particularly with respect to consumer lending, the banks have lost their market share to NBFIs (e.g. AT & T, GMAC etc.) who processed close to 80 per cent of credit card business relative to less than 25 per cent by banks given that twenty years ago banks completely dominated the entire credit card business. The study concludes that due to the competitive pressure from the presence of NBFIs and stock markets, banks and other similar financial intermediaries have moved their role of traditional banking business to a more innovative intermediation.

Bossone (2001) acknowledged that the comparative advantages of banks have been progressively eroding due to the increasing functions of NBFIs. Meanwhile, Vitas (1997) analyzed the role of NBFIs in Egypt and in other MENA[4] countries. His analysis mainly focused on the development of major components of NBFIs with a greater emphasis on contractual savings institutions namely pension funds and life insurance, which by far represent the most important component of NBFIs. The study highlights the pattern of growth of NBFIs around the world in different levels of economies. Contractual savings institutions are found to be the rapidly growing NBFIs during the period 1970-1993. The total assets of pension funds and insurance companies in Netherlands, Switzerland, South Africa, the U.S. and the United Kingdom are found to have exceeded 100 per cent of GDP in the early 1990s, growing from less than 50 per cent in 1970.

Unlike the vast empirical studies with respect to the relationship between banking intermediation and economic growth, very few empirical studies have examined the role of NBFIs on economic growth. The majority of these studies, however, have focused on either pension funds or contractual savings (assets of pension funds and life insurance companies) with respect to their impact on national savings or other financial development especially on stock market development. Murphy and Musalem (2004) conducted an empirical study on the effect of the accumulation of pension funds financial assets on national savings on a panel of 43 countries including several developed and developing countries over the period 1960-2002. Besides pension funds assets they also included a set of controlling variables in the regression. By using Ordinary Least Squares (OLS) and 2OLS estimation methods, they found that the accumulation of pension funds financial assets tends to increase national savings in the cases where these funds are the result of a mandatory pension program. In contrast, the pension funds assets, which are the result of a voluntary savings program, do not show significant effect on national savings.

Although this study did not show a direct link between the accumulation of pension funds assets and the economic growth, the indirect implication is that savings mobilization through compulsory pension funds scheme may have positive impact on economic growth via increasing national savings, as national savings is a proven variable that affects growth positively. Conceptually, high savings rates typically go hand in hand with high and persistent investment rates which is widely acknowledged as one of the key engines for driving sustained economic growth. In a similar study, Granville and Mallick (2004) also found positive and significant correlation between total national savings and the pension savings in the case of the UK. Harichandra and Thangavelu (2004) studied the role of institutional investors[5] in the development of financial sector (banking sector and stock market) and economic growth covering 23 OECD countries over the period 1988-1999. They empirically analyzed the causal impact of institutional investors from both aggregated and disaggregated level using a dynamic framework of the panel vector autoregressive model (PVAR).

The study found that institutional investors (both at the aggregated and disaggregated levels) have significant causal impact on economic growth. Overall, the study suggested that the growth of institutional investors play important role in enhancing the economic activities and the development of financial market in the OECD countries. Davis and Hu (2004) in a study of 38 countries (comprising of 18 OECD and 20 Emerging Market Economies, EMEs) over the period 1960-2002, found that pension fund assets positively and significantly contributes to all sample OECD and emerging market economies. The study utilized a variety of econometric methods (Dynamic Ordinary Least Square or DOLS, Dynamic heterogeneous model with ARDL specification, Johansen, and Generalized Method of Moment or GMM) and the results exhibited consistency in all methods. In some cases, the contribution of pension fund assets to economic growth show evidence of a larger effect for EMEs than the OECD countries.

[4] MENA stands for Middle East and North Africa.
[5] Comprises of pension fund, insurance companies and investment companies.

There are also some other studies available examining the development impact of NBFIs in terms of leasing and factoring companies, insurance companies, pension funds or mutual funds on capital market development and economic activities (e.g., Impavido and Musalem, 2000; Catalan, Impavido and Musalem, 2000; Impavido et al., 2003; Vitas, 1997, 2003; Fernando, Klapper, Sulla and Vittas, 2003 and so on). These studies in general conclude that better developed NBFIs (in their various forms such as contractual savings, mutual funds, leasing and factoring) play important role as a locomotive to further accelerate growth by complementing the services provided by banking institutions and also by providing a strong stimulant to the development of capital market. NBFIs play stronger role as an alternative source of funds through accumulating vast amounts of long-term financial resources and channelling them to economy through capital market. Thus from the review of the existing finance-growth literature we conclude that financial sector development in terms of both banking institutions and non-bank financial institutions (NBFIs) have key role to play in expanding of economic development. However as stated earlier, that the importance of NBFIs in finance-growth literature has long been ignored, in this study we attempt to bring this issue in discussion. We use Malaysia as a case study to examine the development impact of NBFIs on its economic growth.

3.0 SPECIFICATION OF THE MODEL AND VARIABLE SELECTIONS

To begin, we specify the generic regression equation in the following form,

(1) $Y_t = f\ (FA_t, IN_t, TD_t, L_t)$

where Y_t equals real per capita GDP. FA_t refers to the measure of NBFIs development indicator proxied as the ratio of total financial assets of NBFIs to GDP. This measure is called as the measure of size relative to the size of the economy. A rise in this ratio implies a larger NBFIs development and therefore greater intermediation activities and vice versa. The Y_t and FA_t are the focal variables in the analysis measuring economic growth and indicator of NBFIs development respectively. IN_t refers to the ratio of gross fixed capital formation to GDP (henceforth termed investment). TD_t is the total trade (exports plus imports) as a proportion of GDP (henceforth trade openness), and L_t refers to the number of employment. These variables are included as other non-financial factors that we deem more relevant for affecting economic growth. The subscript *t* represents the time period. Expressing the relation in linear form using the variables in natural log, we arrive at the following estimating equation:

$$(2) \qquad LnY_t = \alpha_0 + \alpha_1 LnFA_t + \alpha_2 LnIN_t + \alpha_3 LnTD_t + \alpha_4 LnL_t + u_t$$

where *Ln* indicates natural log, $\alpha's$ are the parameters to be estimated and u_t is an error term. The variables are transformed into logarithmic form in order to minimize the scale effect. The expected signs of all the coefficients are positive. The time series data with annual observation cover the period 1974-2004. The data are obtained from the *Annual Reports* (various issues) of the Central Bank of Malaysia (BNM), published sources of the individual NBFIs, *International Financial Statistics* (IFS) and *Key Indicators*, various issues, Asian Development Bank (ADB).

4.0 ESTIMATION TECHNIQUES

4.1 ARDL model specification and bounds testing procedure

There are several estimation techniques (e.g., Engle-Granger, 1987; Johansen, 1988, 1991 and Johansen-Juselius, 1990) available for investigating the long run cointegrating relationship among time series variables. We employed ARDL bounds testing approach to cointegration developed by Pesaran *et al* (2001) as it has some advantages for small size observations and can be applied irrespective of whether the underlying variables are purely *I*(0), *I*(1), or mutually integrated[6]. The bounds testing procedure is the Ordinary Least Square (OLS) based autoregressive distributed lag (ARDL) approach to cointegration. The test is done in two stages. First, we test for the null of no cointegration against the existence of a long run relationship using the following error correction version of the ARDL model formulated as follows:

$$(3) \quad \Delta LnY_t = \alpha_0 + \sum_{i=1}^{k} \alpha_{1i} \Delta LnY_{t-i} + \sum_{i=1}^{k} \alpha_{2i} \Delta LnFA_{t-i} + \sum_{i=1}^{k} \alpha_{3i} \Delta LnIN_{t-i} + \sum_{i=1}^{k} \alpha_{4i} \Delta LnTD_{t-i} +$$

$$\sum_{i=1}^{k} \alpha_{5i} \Delta LnL_{t-i} + \alpha_6 LnY_{t-1} + \alpha_7 LnFA_{t-1} + \alpha_8 LnIN_{t-1} + \alpha_9 LnLD_{t-1} + \alpha_{10} LnL_{t-1} + \varepsilon_{1t}$$

[6] Although ARDL bounds testing approach does not require unit root test, still it is required in order to ensure that the variables are not integrated of order more than *I*(1) because the presence of *I*(2) variables invalidate the use of computed *F*-statistic as the bounds test is based on the assumption that the underlying variables must be either *I*(0) or *I*(1) or mutually integrated.

Here Δ indicates first difference operator, *k* is the lag length. $\alpha_6....\alpha_{10}$ refers to long-run coefficients and α_0 is the drift. Other variables are defined as before. The first part of equations (3) with $\alpha_{1i....}\alpha_{5i}$ represents the short run dynamics of the model, whereas the second part with α_i (i=6….10) represents the long run relationship. The null hypothesis of no cointegration among the variables in equation (3) is (H_0: $\alpha_6 = \alpha_7 = \alpha_8 = \alpha_9 = \alpha_{10} = 0$) against the alternative hypothesis (H_1: $\alpha_6 \neq \alpha_7 \neq \alpha_8 \neq \alpha_9 \neq \alpha_{10} \neq 0$). The hypotheses are tested based on the *Wald* or *F*-statistic. The *F*-test used in this procedure has a non-standard distribution. The calculated *F*-statistics are compared with two sets of critical values[7]: upper bound critical values and the lower bound critical values.

Accordingly, if the computed *F*-statistic falls below the lower bound critical value, the null hypothesis of 'no cointegration' cannot be rejected but if the test statistic exceeds the upper bound critical value, the null hypothesis of 'no cointegration' is rejected implying that the underlying variables are cointegrated. In other words, there exists long run equilibrium relationship among the variables. However, if the computed *F*-statistic falls between these two value bounds the decision is inconclusive and thus to make any conclusive inference knowledge of the order of the integration of the underlying variables is required (Pesaran *et al*. 2001, p. 290). Once the test confirms the existence of cointegration, we can move to the second stage to obtain the long run and the short run dynamics of the error correction estimates for the selected ARDL models. In the presence of long run relationship the associated ARDL error correction model of Eq.(3) can be constructed as follows:

$$\Delta LnY_t = \alpha_0 + \sum_{i=1}^{k} \alpha_1 \Delta LnY_{t-i} + \sum_{i=0}^{k} \alpha_2 \Delta LnFA_{t-i} + \sum_{i=0}^{k} \alpha_3 \Delta LnIN_{t-i} + \sum_{i=0}^{k} \alpha_4 \Delta LnLD_{t-i} + \sum_{i=0}^{k} \alpha_5 \Delta LnL_{t-i} + \psi ECT_{t-1} + \nu_t \quad (4)$$

Where Δ is the first difference operator, $\alpha_i's$ are the short-run dynamic coefficients of the model and ψ is the coefficient of the error correction term[8] that measures the speed of adjustment.

5.0 ESTIMATION RESULTS AND INTERPRETATION

5.1 Unit Root and Cointegration Tests

Although the bounds testing approach to cointegration does not require pre-testing for the stationarity properties or order of integration of the underlying series, the checking of the order of integration is still important. This is to make sure the validity of the use of the ARDL technique in the sense that the order of integration must not exceed *I*(1). The test for stationarity properties of the data series are usually done by conducting unit root test. There are several methods available for checking the stationarity properties of the data series. In this study, we have applied two widely used methods of unit root tests: Augmented Dickey-Fuller (ADF) test and Phillips Perron (PP) test. Lags are selected based on SIC. The unit root tests results are presented in Table 5.1

Insert Table 5.1 here

Table 5.1 presents the results of stationarity test in level and in the first difference. Based on ADF test statistic, we found NBFIs assets series stationary in level at 5% significance level. The PP test statistic further supports this result. However, both the ADF and the PP test statistics show that all the other series are integrated of order one or *I*(1). This indicates that the order of integration of the selected variables is of mix and thus appropriate to apply bounds testing approach. The cointegration results are presented in Table 5.2. We have set the maximum lag length to 2. The results show that at a lag order of 2, the computed *F*-statistics exceed the 95% upper bound critical value rejecting the null hypothesis of 'no cointegration'. In other words, at a lag order of 2, we find evidence of long run cointegration among the variables in equation 3.

Insert Table 5.2 here

The long run and short run coefficient estimates for the selected ARDL models along with *ECTs* are reported in Table 5.3 & 5.4 respectively.

Insert Table 5.3 here

[7]Critical values differ based on sample size. In the original bounds testing procedure, Pesaran and Pesaran (1997) and Pesaran *et al* (2001) generated critical values based on 500 and 1000 sample observations respectively. Since our sample size is relatively small with only 29 annual observations, we employ critical values tabulated by Narayan (2004) are based on sample size of 31.

[8] ECT is derived from the long run cointegrating relationship

The long run coefficient estimates are all statistically significant as expected. More importantly as expected, the long run coefficient of NBFIs denoted as *FA* is positive and statistically significant at 5% significance level implying that a 1% increase in the ratio of *FA* to GDP leads to an increase of 0.89 percent in per capita real GDP. The long run results thus suggest that the NBFIs and other selected variables in model are important determinants of per capita real GDP in Malaysia. The results of the short run dynamic coefficients are also consistent with the long run coefficient estimates as reported in Table 5.4.

Insert Table 5.4 here

Results in Table 5.4 show that the coefficient of the error correction term ($ECT_{t-1)}$ is statistically significant at 1% significance level. Importantly, the *ECT* carries the correct negative sign. The speed of adjustment to the long run equilibrium after a shock is relatively high in all situations. In other words, approximately 55% to 66% of the disequilibria are corrected in the current year. Over all, the regression results suggest that the underlying ARDL model fits the data reasonably well as the adjusted *R*-squared appears considerably high (0.65 to 0.69), the *F*-statistic which measures the joint significance of all the regressors in the model is highly significant and the model also passes through a battery of diagnostic tests such as serial correlation, functional form, normality and heteroscedasticity as presented below in Table 5.5

Insert Table 5.5 here

Overall, from the estimation results we arrive at the key conclusions that-

(i) There exists a cointegrating equilibrium relationship between per capita real GDP and the financial assets of the NBFIs.

(ii) The NBFIs and the other variables such as investment, trade openness, and employment play significant role in influencing per capita GDP in Malaysia.

6.0 PARAMETER STABILITY TESTS

Finally we also examine the stability of the error correction representation of the ARDL model by applying the CUSUM and CUSUMSQ stability tests as suggested by Pesaran and Pesaran (1997). The tests are presented by means of graphs as shown in Figure 6.1 & Figure 6.2. Since, the parameters stability tests reveal that neither CUSUM of squares nor the CUSUM plots cross the critical bounds of 5% significance level, the null hypothesis that all coefficients in the selected error correction representation of the ARDL models are stable over time are accepted. Overall, the results favour the evidence of no significant structural instability and hence it is unlikely that the selected ARDL models suffer from significant misspecification problem.

Insert Figure 6.1 here
Insert Figure 6.2 here

7.0 *CONCLUDING REMARKS*

In this paper, we examined the long-run relationship between per capita real GDP and the NBFIs in Malaysia using the ARDL bounds testing approach to cointegration over the period 1974-2004. The test revealed that there is a stable long run relationship between per capita real GDP and the NBFIs, investment, trade openness, and employment. The existence of a stable long run relationship is further confirmed by the negative and significant coefficients of the error correction terms (*ECT*). We also utilized the CUSUM and CUSUM of squares stability test. The test confirms no evidence of any significant structural instability of the long run coefficients of the output function. The estimation results suggest that both NBFIs and the other variables used in the model play important role for explaining the variations in the long run per capita real GDP in Malaysia. The most striking finding is that the NBFIs have a positive and significant impact on long run per capita real GDP in Malaysia.

The empirical evidence suggests that the financial development indicator in the form of the NBFIs and investment, trade openness and employment are in part responsible for future change in the per capita real GDP in Malaysia. Importantly, the results indicate that the NBFIs is one of the important components of the financial sectors through which the financial resources are effectively channeled from savers to the users in the economy. As such it is important that the relevant authorities should thoroughly examine the mechanisms through which the NBFIs most effectively deliver financial services to promote long run economic growth. This can help the concerned authorities to formulate prudent policies for its further development and hence achieving a long run sustainable economic growth in Malaysia. The development of NBFIs can be an important locomotive for promoting economic growth particularly through providing long term financing to the productive investment activities where the financing activities of the conventional banking system are mostly limited. Furthermore, the development of NBFIs can also promote the development of small and medium-sized industries which have limited opportunities to meet their financial needs from entering into the stock market and also from the commercial banking system.

The empirical findings can also be applicable for other countries of similar interest. As such while considering the financial development (particularly banks and stock market) as an important vehicle for fostering economic growth, the policymakers can also promote the NBFIs as an integral part of the overall financial system. Together they can exert a greater long run and sustainable impact on the economic performance of the country.

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Table 5.1: ADF and PP Unit Root Tests

	Level		First Difference	
Variable	ADF	PP	ADF	PP
LnY	-1.5373 [0]	-1.4798 [2]	-6.7162* [1]	-12.115* [3]
LnFA	-3.3605** [0]	-3.2120** [2]	-4.6304 *[0]	-4.5903* [2]
LnIN	-1.9478 [0]	-2.0813 [1]	-4.8055 *[0]	-4.7901* [2]
LnL	-0.8101 [0]	-0.8574 [1]	-6.3522* [0]	-6.3522* [0]
LnTD	-0.6155 [0]	-0.5234 [3]	-5.4826 *[0]	-5.5342* [3]

Notes: ** and *denote significance at 5% and 1% significance level respectively. Figures in [.] under ADF represent Lag length selected based on Schwartz Info Criterion (SIC) and under PP represent Bandwidth.

Table 5.2: *F*-statistics for testing the existence of cointegration relationship

Order of Lag	*F*-statistics
1	F (5, 16) = 3.4252
2	F (5, 11) = 4.8581**

Notes: The relevant critical value bounds are given in Appendix A3, Case II: (restricted intercept and no trend, with the number of regressors = 4 and 31 observations) in Narayan (2004). The lower critical value bound headed as *I*(0) is 3.033 and the upper critical value bound headed as *I*(1) is 4.188. ** denotes that the *F*-statistic falls above the 95% upper bound.

Table 5.3: Long Run Coefficient Estimates using the ARDL approach

Dependent variable is LnY_t	Model Selection Criterion		
Regressors	SBC ARDL (1,1,0,2,0)	AIC ARDL(1,1,0,2,2)	R-Bar-Squared ARDL(1,1,0,2,2)
LnFA	0.8986** [2.4223]	0.9310* [3.1286]	0.9310* [3.1286]
LnIN	0.1258** [2.2626]	0.0945*** [1.9735]	0.0945*** [1.9735]
LnTD	0.4518* [2.8052]	0.5026* [3.8619]	0.5026* [3.8619]
LnL	0.6006* [3.1287]	0.5404* [3.4684]	0.5404* [3.4684]
Constant	3.8519** [2.4207]	4.3721* [3.3819]	4.3721* [3.3819]

Notes: Figures in [.] are *t*-ratios. *, ** and *** denote significance level at 1%, 5% and 10% respectively.

Table 5.4: Error Correction Representation for the selected ARDL Model

Dependent variable ΔLnY_t			
Model Selection Criterion			
Regressor	SBC ARDL (1,1,0,2,0)	AIC ARDL(1,1,0,2,2)	R-Bar-Squared ARDL(1,1,0,2,2)
$\Delta LnFA_t$	0.2566** [2.1355]	0.2297*** [1.9730]	0.2297*** [1.9730]
$\Delta LnIN_t$	0.0700** [2.1597]	0.0627*** [2.0283]	0.0627*** [2.0283]
$\Delta LnTD_t$	0.0960 [1.2321]	0.1411*** [1.7806]	0.1411*** [1.7806]
$\Delta LnTD_{t-1}$	-0.1974** [2.3241]	-0.2371** [2.7102]	-0.2371** [2.7102]
ΔLnL_t	0.3345** [2.5710]	-0.1097 [0.2539]	-0.1097 [0.2539]
ΔLnL_{t-1}	-	-0.7303** [2.2056]	-0.7303** [2.2056]
Constant	2.1450** [2.5019]	2.9030* [3.0822]	2.9030* [3.0822]
ECM (-1)	-0.5568* [6.5406]	-0.6639* [5.8987]	-0.6639* [5.8987]
R-Bar-Squared	0.65431	0.69455	0.69455
F-statistic	10.7971(0.000)	11.1736(0.000)	11.1736(0.000)
DW-statistic	2.2660	2.4536	2.4536

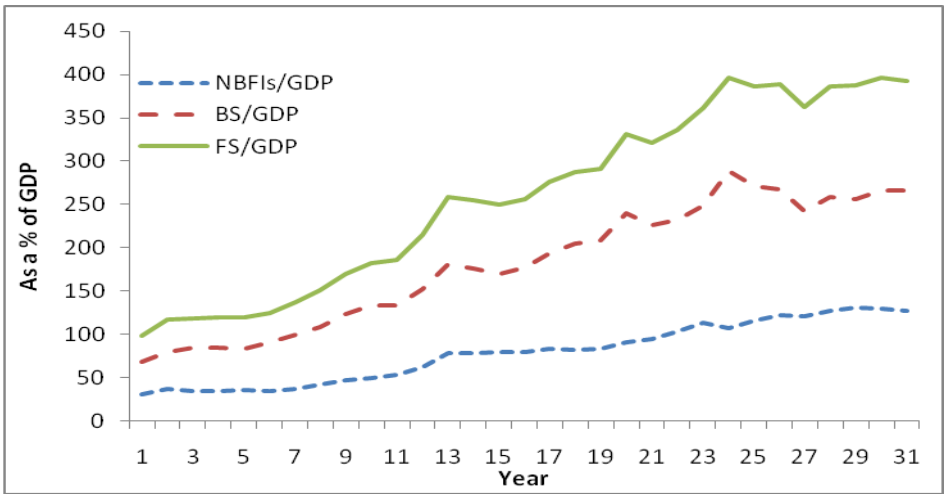
Notes: *, ** and *** denote significance at 1%, 5% and 10% levels respectively. Figures in [.] are *t*-ratios and in parentheses are *p*-values.

Table 5.5: ARDL model diagnostic test statistics

LM Test Statistics	
Serial Correlation	$\chi^2_{SC}(1)$ = 2.4242 [0.119]
Functional Form	$\chi^2_{FF}(1)$ = 1.1995 [0.273]
Normality test	$\chi^2_{N}(2)$ = 0.7108 [0.701]
Heteroscedasticity	$\chi^2_{H}(1)$ = 3.2211 [0.073]

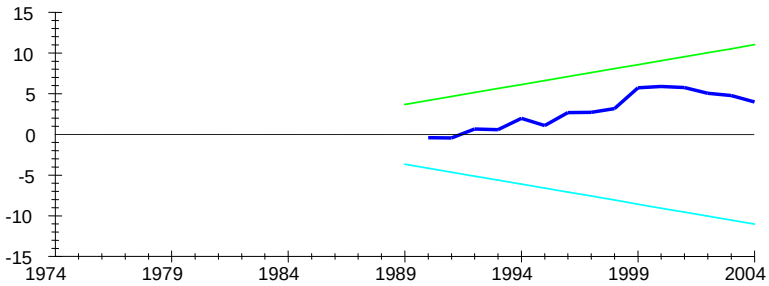
Notes: χ^2_{SC}, χ^2_{FF}, χ^2_{N}, and χ^2_{H} are Lagrange multiplier statistics for testing of residual correlation, functional form misspecification, normality and heteroscedasticity respectively. These statistics are distributed as Chi-squared with degrees of freedom in parentheses. Figures in [.] are *p*-values.

Figure 1.1 Ratio of Financial Assets to GDP (%), 1974 – 2004.



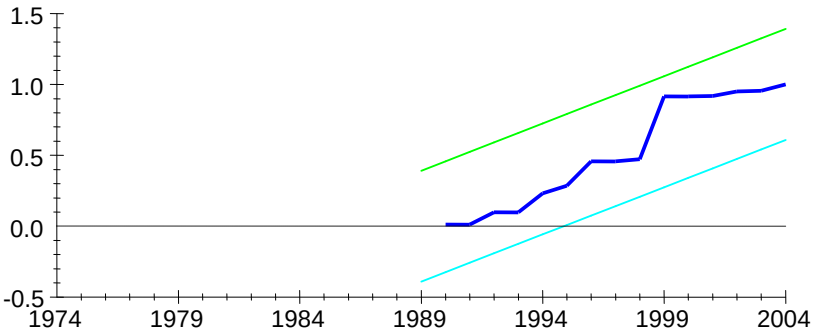
Notes: FS = Financial System, BS = Banking System, NBFIs = Non-bank financial intermediaries/institutions.

Figure 6.1: Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Figure 6.2: Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level