BANK LENDING AND ECONOMIC GROWTH IN MALAYSIA: REVISITED

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ABSTRACT

The present study has re-investigated the role of bank financing on Malaysian economic development by using the bounds testing approach proposed in Pesaran et al. (2001). This study had covered the annual periods from 1960 to 1998. The findings of the study are as follows. First, contrary to a previous study [Tang, 2000], it was found that there was no long run relationship between the volume of bank lending and the real Gross Domestic Product (GDP). Second, a long run relationship had been observed between real GDP, and volume of bank lending after including real exports variable into cointegration system. This finding clearly shows the potential bias of omission variables in bivariate specification. An interesting outcome of the study is the suggestion that bank financing is strongly led by a country's economic development in the long run. The estimated elasticity is 3.02. The study suggests that in order to support a sustainable economic growth in Malaysia, bank financing for the private sector will be necessary.

Key Words: bank lending; economic growth; long run relationship; unrestricted error correction model.

ABSTRAK

(Berthélemy and Varoudakis, 1996a, p.17). Following Garson’s (1998) view, financial intermediation is seen as the main engine of economic growth because it causes the money to circulate in the economy by actively seeking deposits and lending mobilized funds to those who need credit. Credit was not to be regarded as mere input, but the engine of growth itself. An advantage of banking intermediaries over the stock markets or bond markets is that they can be more efficient in terms of information gathering and monitoring cost (Berthélemy and Varoudakis, 1996a, p. 27). However, the relationships between finance and growth are unclear. Furthermore, they pointed out that ‘To know whether the comparative development of financial markets (equity and bond markets) and banks can influence economic growth has long been a hotly debated question - to date unresolved - in economic theory’ (Berthélemy and Varoudakis, 1996a, p.26).

**Figure 1**

Share of Real Bank Lending and Real Exports on Real GDP for the Period 1960-1998

A motivation behind this study is that the Malaysian economy has experienced remarkable growth from 1990 to 1996, with an average annual growth of 9.5 per cent. During this period, the ratios of bank lending to GDP, as well as exports to GDP are found to be exceed 100 per cent (see Figure 1, the figures are calculated from data obtained
Using the Engle and Granger (1987) approach, Tang (2000) found that commercial bank lending and real Gross Domestic Product (GDP) were cointegrated over the annual period from 1959 to 1998. The bank lending showed a positive long run effect on real GDP and its elasticity is 0.5. The elasticity of real GDP with respect to bank lending is 1.97, which can be considered elastic. However, bank credit extension showed a negative short run effect (−0.39) on economic growth. Using an error correction model (Engle and Granger, 1987), Tang (2000) found a two-way causality between bank lending and economic growth.²

An active intermediation influences macroeconomic outcomes most emphatically when countries are in the earlier stages of economic development (Rousea and Wachtel, 1998, p. 657-658). Therefore, an understanding of the inter-effects between intermediation variables – bank lending and economic growth, is seen as an advantage for policymakers when channeling funds to economic sectors. Bank lending can be identified as an alternative source of growth thought its efficacy economy financing in Malaysia.

The present study has also used a recently developed econometric method for cointegration analysis – the bounds testing approach which is based on UECM estimate (Pesaran et al., 2001). Mah (2000, p. 240) stated that bounds testing approach and UECM have certain preferences over the conventionally used cointegration techniques like in Engle-Granger (1987) or Johansen-Juselius (1990), in the sense that the latter suffers from problems of small sample size. Furthermore, the bounds test procedure can avoid the potential bias from low power of unit root tests. Pre-investigation of the series integration, I(d) is not required once one can make a conclusion from the bounds test about the presence of a cointegrating relation (Pesaran et al., 2001). Some empirical applications of the Pesaran et al. approach can be found in Mah (2000), Abbott, Darnell, and Evans (2001), Tang (2001a), and Tang (2002a).

**REVIEW OF EMPIRICAL LITERATURE**

Some of the existing empirical studies on testing the relationship between financial development and economic growth are briefly reviewed below.

Jao (1976) found that the money balance-GDP ratio and growth of per capita real money balances (proxy of financial intermediation variables) had a strong positive relationship with economic growth. The study had used cross-section data averaged over 1967-72 in 44 developing
(cointegrated) was found among measures of financial intensity and real per capita levels of output and the monetary base. The results of Granger causality test suggested a leading role for the intermediation variables in real sector activity, but feed back effects were significantly insignificant. This led to the conclusion that intermediation played an important role in the rapid industrial transformations of those countries. In another study, Odedokun (1999) included the size of the monetary sector (M1, M2 and private sector credit stock) into Feder's sectoral production functions of 22 industrial and 100 developing countries (1961-90). The findings revealed beneficial effects on production in the real sector and also on the overall economic growth. The result for Asian developing countries was that, the estimated coefficient of growth for real private sector credit stock is 0.001 and the insignificant t-value is 0.1 and R-square of the model is 9.1%. These figures were found to be significant for developing countries. The financial intermediation had promoted economic growth in most countries.

In addition, Xu's (2000) study of 41 countries found strong evidence that financial development (proxy by liquid liabilities of the financial intermediary sector to GDP) was important to growth, and investment was an important channel through which financial development affected growth. However, contrary to the above studies, the empirical work in Ram (1999) failed to support the view that financial development would be able to promote economic growth. He had used data from 95 individual countries. Tang (2001b) investigated the direction of causality for bank lending and economic growth in India using the Engle-Granger (1987) approach. He found that there was no long run relationship among the non-stationary variables, I(1) – real income and real bank lending, but there was short run causality between bank credit and economic growth.

The above empirical studies had examined the causal relationship between financial variables and growth. A recent empirical study by Beck, Levine and Loayza (2000) had examined the impact of financial intermediaries on private savings rates, capital accumulation, productivity growth and overall economic growth. Using instrumental variable estimator (traditional cross-sectional), and dynamic panel techniques, the study found that (1) financial intermediaries exert a large, positive impact on total factor productivity growth, which feeds through to overall GDP growth, and (2) the long-run links between financial intermediary development and both physical capital growth and private savings rates were tenuous. Other empirical work which had used cross-country sample and panel data can be found in Gregorio and Guidottti (1995). There are other empirical studies which have investi-
thermore, if the test statistic (bounds test) falls between the lower-upper critical bounds, inconclusive inference can be made, and the order of integration of the variables needs to be examined (Pesaran, et al., 2001).

The cointegrating equation for testing the long run relations among bank lending and real GDP can be expressed as the following equations:

\[ \ln Y_t = a_0 + a_1 \ln B_t + \text{error term} \]  
\( (1) \)

\[ \ln B_t = a_0 + a_1 \ln Y_t + \text{error term} \]  
\( (2) \)

where \( Y \) is real GDP, and \( B \) is volume of bank lending. \( \ln \) is natural logarithm form.

This study has considered the bias of using bivariate framework in cointegration analysis as stated by Al-Yousif (1999, p.68), “bivariate models are potentially misspecified and may be flawed due to the omission-of-variable phenomenon”. Thus, one needs an additional variable in bivariate cointegrating framework, which is real exports. The real exports variable is a major cause (engine) of economic growth (see Frankel and Romer, 1999). This inclusion is consistent with Darrat et al.’s (1989) study that employed export growth as one of the additional variables in analyzing the causal link between financial deepening and economic growth. Based on the cointegrating Equations (1) and (2), the cointegrating equations based on trivariate framework with inclusion of real exports variable are:

\[ \ln Y_t = a_0 + a_1 \ln B_t + a_2 \ln E_t + \text{error term} \]  
\( (3) \)

\[ \ln B_t = a_0 + a_1 \ln Y_t + a_2 \ln E_t + \text{error term} \]  
\( (4) \)

\[ \ln E_t = a_0 + a_1 \ln Y_t + a_2 \ln B_t + \text{error term} \]  
\( (5) \)

where \( Y_t \) is real gross domestic product, and \( B_t \) is real commercial banks lending, and \( E_t \) is real export of goods and services. \( \ln \) is natural logarithm form.

Basically, the relationship between financial development and economic growth is argued in the new theories of endogenous economic growth and financial liberalization theory. These theories assume that financial development leads to economic growth (Kar and Pentecost, 2000, p.6). Since this study also examines the inter-relationship between bank lending and real GDP, with control variables of real ex...
Next, an unrestricted error-correction model (UECM) can be constructed for Equation (1) to (5). For example, the UECM for equation (1) can be re-written as below:

\[ \Delta \ln Y_t = b_0 + \sum_{i=0}^{l} \sum_{i=0}^{l} b_{1i} \Delta \ln B_{t-i} + \sum_{i=3}^{l} b_{2i} \Delta \ln Y_{t-i} \]

\[ + b_3 \ln Y_{t-1} + b_4 \ln B_{t-1} + \text{error term} \]  

where \( Y \) (left-hand side) is the dependent variable, real GDP, and \( B \) is the independent variable, volume of bank lending. \( \Delta \) is first difference operator, \( X_i - X_{i-1} \), \( l \) is the lag length. The UECM is estimated by using the Ordinary Least Squares (OLS) estimator. The UECM for Equations (2) to (5) can be derived in similar way.

Pesaran et al. (2001) proposed the bounds test, which is based on the Wald test (F-statistic) to investigate the existence of a cointegrating relation between the examined variables. The asymptotic distribution of the F-statistic is non-standard under the null hypothesis of no cointegration relationship between the examined variables, irrespective of whether the explanatory variables are purely I(0) or purely I(1). The bounds test is conducted in the following ways. First, the null of non cointegration is tested by excluding the lagged level variables on the right hand side of the UECM, that is \( \ln B_{t-1} \) and \( \ln B_{t-2} \). It is a joint significance test (Wald test) for the null of no cointegrating relation \( (H_0 : b_3 = b_4 = 0) \), against the alternative hypothesis for a cointegrating relation \( (H_A : b_3 \neq 0, b_4 \neq 0) \). Under the conventionally used significance level \( \alpha = 10\%, 5\% \) or \( 1\% \), if the test statistic (F-statistic, Wald test) lies outside the critical bounds, a conclusive inference can be made without considering the order of integration of the explanatory variables. In other words, if the F-statistic exceeds the upper critical bound, then the null of no cointegration can be rejected. We cannot reject the null hypothesis if the test statistic lies below the lower critical bound.

**EMPIRICAL RESULTS**

Using the annual data, it was initially estimated that the UECM for Equations (1) to (5) in general form would have three years lag length, \( l=3 \). In order to minimize the problem of being over-parameterized, a set of final UECMs had been derived from the general UECMs by eliminating the statistically insignificant (\( \alpha = 10\% \)) short run variables (in first difference form) sequentially (see Tang, 2002a). It was also en-
cointegration approaches (like Engle and Granger, 1987) are inap-
appropriate for finite sample study. Mah (2000) had recommended the use
of the unrestricted error correction model (Pesaran et al. approach) for
a small sample study. Another justification is the specification error of
some omitted important variables (see Al-Yousif, 1999, p. 69).

Table 2
Estimated Final UECMs (Trivariate specification – LnB, LnY and LnE)

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>UECM (3)</th>
<th>UECM (4)</th>
<th>UECM (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ΔLnY</td>
<td>ΔLnB</td>
<td>ΔLnE</td>
</tr>
<tr>
<td>ΔLnY (t-1)</td>
<td>0.819*</td>
<td>-1.494**</td>
<td>-0.833**</td>
</tr>
<tr>
<td>ΔLnY (t-2)</td>
<td>-0.607**</td>
<td>0.833</td>
<td>1.193*</td>
</tr>
<tr>
<td>ΔLnY (t-3)</td>
<td>0.306</td>
<td>-1.224**</td>
<td></td>
</tr>
<tr>
<td>ΔLnB</td>
<td>0.174**</td>
<td></td>
<td>-0.184</td>
</tr>
<tr>
<td>ΔLnB (t-1)</td>
<td></td>
<td>-0.188***</td>
<td></td>
</tr>
<tr>
<td>ΔLnB (t-2)</td>
<td></td>
<td>-0.250**</td>
<td></td>
</tr>
<tr>
<td>ΔLnB (t-3)</td>
<td></td>
<td>-0.164</td>
<td>-0.169***</td>
</tr>
<tr>
<td>ΔLnE</td>
<td>0.426*</td>
<td>-0.362</td>
<td></td>
</tr>
<tr>
<td>ΔLnE (t-1)</td>
<td>-0.119</td>
<td>0.366</td>
<td></td>
</tr>
<tr>
<td>ΔLnE (t-2)</td>
<td>0.276**</td>
<td></td>
<td>-0.540*</td>
</tr>
<tr>
<td>ΔLnE (t-3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LnY (t-1)</td>
<td>-0.260</td>
<td>1.374*</td>
<td>0.080</td>
</tr>
<tr>
<td>LnB (t-1)</td>
<td>0.080</td>
<td>-0.455*</td>
<td>0.023</td>
</tr>
<tr>
<td>LnE (t-1)</td>
<td>0.056</td>
<td>-0.357*</td>
<td>-0.057</td>
</tr>
<tr>
<td>Constant</td>
<td>0.615</td>
<td>-2.957*</td>
<td>-0.065</td>
</tr>
<tr>
<td>R-squared:</td>
<td>0.692</td>
<td>0.609</td>
<td>0.752</td>
</tr>
<tr>
<td>F-Statistic (p-value)</td>
<td>5.396 (0.000)</td>
<td>3.25 (0.01)</td>
<td>6.343 (0.000)</td>
</tr>
<tr>
<td>Q-Statistics (16):</td>
<td>White noise</td>
<td>White noise</td>
<td>White noise</td>
</tr>
<tr>
<td>Jarque-Bera (p-value):</td>
<td>0.66 (0.719)</td>
<td>1.06 (0.587)</td>
<td>0.074 (0.964)</td>
</tr>
</tbody>
</table>

**Bounds Test:**

| F-statistic: | 3.699 | 4.761 | 7.274 |

#Critical band (10%): lower and upper Conclusion: Inconclusive Cointegrated

3.17 and 4.14 3.17 and 4.14 3.17 and 4.14

*, **, *** denote significant at the 1%, 5% and 10% level. #Unrestricted intercept and no trend (k=2) from Pesaran, et al. (2001)

Furthermore, the exports variable was included into bivariate specification as in Equations (3), (4) and (5), to account for the bias of omitted variables. The estimated final UECMs are as presented in Table 2. For UECMs (4) and (5) the F-statistic (bounds test) are 4.761 and 7.27, which lie above the upper bound, 4.14 (at 10 per cent significance level),
bank lending and export do not have encouraging effects on economic growth in the long run, as there was no long run relationship by normalizing the real GDP variable. The estimated short run elasticities of bank lending and exports on economic growth are inelastic, which were 0.17 and 0.7 respectively. The result is contrary to the conclusions presented in the previous study by Tang (2000) that the extension of bank credit has a negative short run effect on economic growth (-0.39).

The present study has found that bank financing is strongly driven by economic growth, and not in the reversed direction. The elasticity is 3.02, which is considered elastic. The recent data has revealed that the volume of bank lending growth was –3.6 per cent in 1998 during the Asian crisis period (1997-98) compared to 25.9 per cent, 20.5 per cent and 19.04 per cent in 1995, 1996 and 1997 respectively. It is interesting to note that the present study has provided the empirical evidence that bank lending has driven economic growth, and this can be regarded as an effective policy design and monitor in the long run. This implication was further supported by Tang’s (2002b) study that, the existing financial liberalization regulation or policies are able to lead the ASEAN group towards becoming international or regional financial centers in other time zones due to its long run equilibrium relationship of financial liberalization measure (ratio of bank credit to GDP) among the five founding nations of ASEAN.

ENDNOTES

1. Financial intermediaries are, following Gurley and Shaw (1955, original emphasis), individuals or institutions that solicit loanable funds from surplus spending units and allocate these funds among deficit units whose direct debt they absorb.

2. There is a strong reservation of these results since the critical values reported for cointegration test in Tang (2000: 67, Table 4. Estimated cointegrating equations), are based on MacKinnon (1991) which are valid only for a data series, but not for estimated values like in residual series. In short, the MacKinnon (1991) critical values are not appropriate for cointegration tests in the residuals of a regression (see Eviews 4 user’s guide, 2002, p. 332-333). However, Davidson and MacKinnon (1993) generated the correct critical values for cointegration test (residual based approach), which are available in their book (Davidson and MacKinnon, 1993, p. 722 and see Table 20.2).


