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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

Kertas ini mengkaji semula hubungan jangka panjang dan jangka pendek antara pinjaman bank dengan pertumbuhan ekonomi di Malaysia. Data tahunan bagi tempoh 1960 hingga 1998 telah digunakan. Keputusan daripada teknik penganggaran kointegrasi Pesaran et al. (2001) dan model pembetulan ralat tanpa konstren (Unrestricted ECM), memberi penemuan-penemuan berikut: (1) Berbeza dengan kajian lepas [Tang, 2000], tidak wujud hubungan kointegrasi antara pinjaman bank dengan output Keluaran Dalam Negara Kasar (KDNK) benar. (2) Akan tetapi, hubungan kointegrasi cuma wujud antara KDNK benar dengan pinjaman bank dan memasukkan pemboleh ubah eksport ke dalam sistem kointegrasi. Penemuan ini jelas menunjukkan masalah

ketinggalan pemboleh ubah-pemboleh ubah dalam spesifikasi dua pemboleh ubah. (3) Pinjaman bank adalah dipandu oleh pertumbuhan ekonomi dalam jangka panjang. Keanjalannya adalah 3.02. Bagi menyokong pertumbuhan ekonomi Malaysia, pinjaman bank perlu disalurkan kepada sektor swasta.

***Kata Kunci**: kointegrasi, model pembetulan ralat tanpa konstren; pinjaman bank; KDNK benar; Malaysia.*

INTRODUCTION

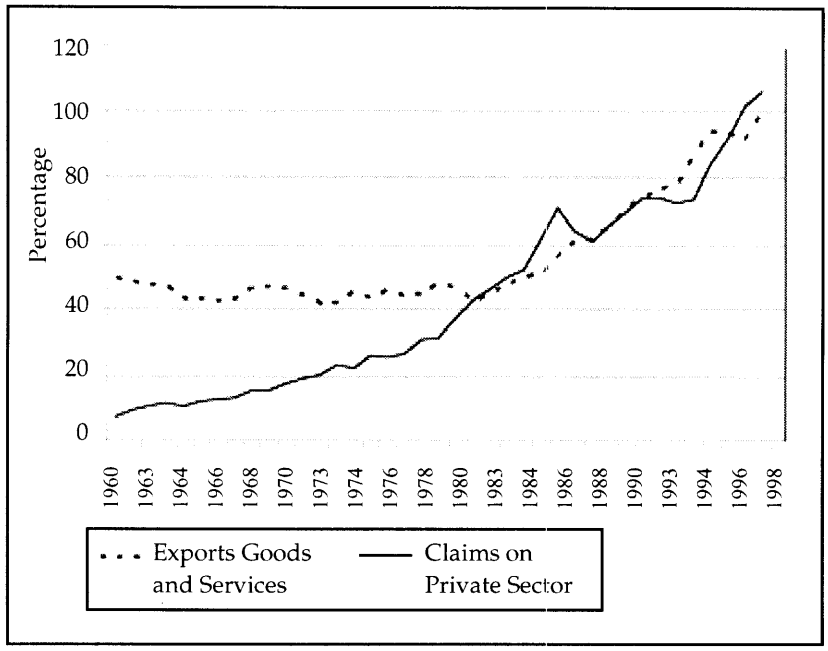
Many factors have contributed to a country's economic growth. For a small but open and developing economy like Malaysia, the crucial factors often singled out are the successful promotion and expansion of the export sector (see Bahmani-Oskooee and Alse, 1993; Al-Yousif, 1999). An issue of concern in this study is that, in the emerging Asian economies, financial intermediation was seen as one of the causes of their rapid economic growth[1]. These economies had favored banks over security markets for financial intermediation, and there was little or no public debt traded (Bosworth, 1998).

Most of the existing empirical studies had made similar observations regarding this matter (Jao, 1976; Fritz 1984; King, 1986; King and Levine, 1993; Odedokun, 1999; Xu, 2000; Beck, Levine and Loayza, 2000), except Ram (1999). The present study seeks to better understand this issue by empirically re-examining the inter-effects of the importance of the bank (proxied by bank lending) and domestic real activity, that is, as reflected in the real Gross Domestic Product (GDP) for Malaysia. We use the bounds testing produce (Pesaran *et al.*, 2001) and the unrestricted error correction model (UECM) for estimation. The findings of this study seem to suggest that there is less empirical evidence to regard the bank as a major cause of economic growth in Malaysia. One the one hand, the study found only significant positive elasticities of bank lending on growth in the short run (current period). The estimated elasticities are slightly inelastic; 0.189 (Table 1) and 0.174 (Table 2). On the other hand, the coefficient of bank lending with two years lag is significantly negative, -0.16. The results also show strong evidence that bank lending in Malaysia is driven by real output in the long run, with an estimated elasticity of 3.019.

Traditional theories insist on the passive role of a country's financial system, as the system merely adapts itself to the financial needs of the economy's real sector, and fits in with the autonomous development of that sector. In contrast, contemporary theories put forward the idea that financial development has a causal influence on growth

(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, p26).

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

from International Financial Statistics and the International Monetary Fund).

According to Mishkin (1999, p.710), credit extensions in the crisis-hit Asian countries grew at faster rates and reached higher levels than the GDP. In this regard, a rapid domestic credit growth - *"lending booms"* was one of the signals of the Asian financial crisis, a point addressed by Bacha (1997), Kaminsky, Lizondo and Reinhart (1998), Sharma (1999), and Mishkin (1999). The problem with the resulting lending boom was not that lending expanded, but that it expanded so rapidly that excessive risk-taking was the result, with large losses on loans in the future. Banks play an important role in overcoming adverse selections and moral hazard problems in the credit market, and are the only sources of lending for many businesses. When bank lending collapses, the economy follows suit (Mishkin, 1999, p. 713). This was also pointed out by Goldstein (1998), who said,

> More than anything else, it was financial-sector weaknesses that got the Asian countries into deep trouble. During the 1990s, each of the 4 ASEAN economies (Thailand, Indonesia, Malaysia, and the Philippines) experienced a credit boom, that is, the growth of bank and non-bank credit to the private sector exceeded by a wide margin the already rapid growth of the real economy. The credit boom was stoked in part by large net private capital inflows, and much of it was directed to real estate and equities.

Thus, as stated earlier, the objective of this study is to re-examine empirically the inter-effects of bank lending and output in a small, but open and developing economy as found in Malaysia. Liu *et al.*, (2001: 199, footnote 2), have justified that *"...these results should be interpreted with caution since Granger causality does not imply that one variable is the effect or the result of another. Granger causality only offers to the precedence of one variable over the others"*.

The present study seeks to understand the following issues. An early study by Tang (1999) used yearly data from 1960 to 1998, documented that the growth of bank lending could promote Malaysian economic growth in the current period. The estimated coefficients are about 0.15. However, he found that there was a significant negative effect of lagged two years of credit growth on Malaysian economic growth. The study was mainly based on dynamic models (short run) instead of a *static* or *long run* specification. This issue was also considered in Tang (2000), in which cointegration and error correction techniques were employed.

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 (Roussea 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

and 23 industrial countries. In another study, Wai (1980) documented that the financial structure (real stock of domestic credit and flow of the credit from the financial sector) provided a better explanation of growth than investment of 11 of the 13 developing countries over the annual period from 1951 to 1977. Using data from the Philippines, Fritz (1984) examined the direction of causation between economic development and financial intermediation. He found that financial intermediation caused economic development at an early stage of economic development while the direction of causation was reversed at a later stage. Using the OLS regression approach and Indian annual data, Gupta (1986) discovered that intermediation variables (growth of money balance) had a positive association with economic growth.

King (1986) examined the question of how monetary aggregates may aid the prediction future GNP behavior. The past growth of demand deposits, commercial and industrial loans, other banks loans, and total bank loans were used to represent the importance of banks. All of these variables were found to 'Granger' cause the future growth of the GNP, except commercial and industrial loans. Furthermore, King and Levine (1993) documented that financial services were importantly linked to economic growth and productivity improvements. The four interested financial development indicators were ratio of liquid liabilities to GDP, deposit bank domestic credit divided by deposit bank domestic credit plus central bank domestic credit, ratio of claims on non-financial private sector to domestic credit, and ratio of private sector gross claims to GDP. The study showed that better financial systems stimulate economic growth by accelerating the rate of productivity enhancement. Lang and Nakamura (1995) is of the view that, a recurring issue in monetary economics concerns the extent to which the central bank influences economic activities, and whether this was due to a credit channel in addition to a direct monetary channel. They found that the proportion of relatively high quality new loans did Granger-cause GDP. On the one hand, Samolyk (1994, pp. 263 and 265) emphaised that although credit variables helped to predict economic activity, this did not imply that it also generates economic activities. A macroeconomic credit channel complicates matters as it is hard to interpret whether financial flows are causing output or merely mirroring underlying investment opportunities. To the extent that credit flows reflect expectations about investment opportunities, local lending can help to predict expectation without causing output growth.

Rousseau and Wachtel (1998) examined the links between the intensity of financial intermediation (deposit banks) and the economic performance of five industrialized countries. A long run relationship

(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).[3] 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 Guidotti (1995). There are other empirical studies which have investi-

gated the role of financial development on economic growth and these are available in the literature.[4]

MODEL SPECIFICATION, METHOD AND DATA

We use bank lending as proxy to the importance of banks in view of its relevance for policy implication. For example, when the Government redirected the bank loans (funds) channeled to the private sector in order to promote economic development or for recovery from the Asian financial crisis (1997-1998), there was a minimum annual loan growth of 8 per cent targeted at all banking institutions. This was done in order to enable the country to achieve a 1 per cent GDP growth in 1999 (*The Star*, 1998). In a study by Gregorio and Guidotti (1995), it was suggested that one should use the ratio of *bank credit* to the private sector to GDP as the indicator of financial development. This was bank credit more accurately represented the actual volume of funds channeled to the private sector, and was more directly linked to investment and economic growth. Furthermore, consider the argument made in Odedokun (1996) that we best manipulate the financial ratios variables, an exercise which would require knowledge of whether and how the variables affect growth. In very broad terms, the variables can be seen to influence growth either by changing the quantum of investible resource, or by affecting the efficiency of utilization of a given quantum of resources, or both.

Apart from the use of a bank lending variable, the importance of banks can also be measured through several indicators like bank deposits and bank assets (Rousseau and Wachtel, 1998; Beck, Levine and Louise, 2000). However, a reservation to not use other bank variables is that these variables (bank lending, bank deposits, and bank assets) are interrelated and they would appear as so in a bank's balance sheet. Using the error-correction technique, Tang and Faoziah (2001) found that a set of indicators of importance of banks did Granger-cause Malaysian economic growth over the period 1959 to 1997. These indicators are capital adequacy, deposit composition, liquidity, and volume of loans to total assets.

The conventionally used cointegration techniques (Engle and Granger, 1987; Johansen and Juselius, 1990) require a pre-test for unit root. However, bounds testing approach, considers the low power of unit root test for a small sample study, thus, the pre-investigation of the degree of integration (unit root test), I(d) of the series is not necessary. Fur-

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:

$$LnY_t = a_0 + a_1 LnB_t + \text{error term} \quad (1)$$
$$LnB_t = a_0 + a_1 LnY_t + \text{error term} \quad (2)$$

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:

$$LnY_t = a_0 + a_1 LnB_t + a_2 LnE_t + \text{error term} \quad (3)$$
$$LnB_t = a_0 + a_1 LnY_t + a_2 LnE_t + \text{error term} \quad (4)$$
$$LnE_t = a_0 + a_1 LnY_t + a_2 LnB_t + \text{error term} \quad (5)$$

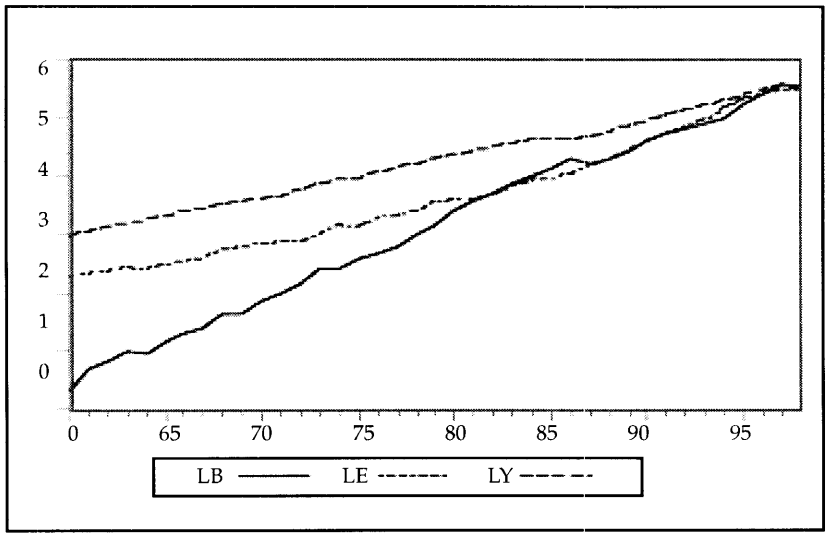
where Y_t is real gross domestic product, and B_t is real commercial banks lending, and E_t is real export of goods and services. *Ln* is natural logarithm form.

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).[5] Since this study also examines the inter-relationship between bank lending and real GDP, with control variables of real ex

ports for omission variables bias, the construction of Equations (1) to (5) are based on the cointegration approach (see Lyons and Murinde, 1994). The main purpose is to test the presence of a cointegrating relation between the examined variables. Empirical studies on testing the relationship between financial development and real output are widely conducted using time series technique (see Odedokun, 1999, pp. 236-238). For instance, based on Granger-causality equations (Granger, 1969), Darrat *et al.* (1989) examined the causal link between financial deepening and growth with additional variables of exports growth and price expectations. Thus, the question about the reliability of the models (1) to (5) had not been raised here, but the specification of error like bias of omission variables was considered in this study.

In the present study, the economic activity is proxied by real GDP (Y), whereby nominal GDP is deflated by a GDP deflator (1995=100). The volume of bank lending, B is total claims on private sector that has been deflated by the GDP deflator (in 1995 prices). Real exports on goods and services, E is current value and is deflated by an import implicit price index (1995=100). The sample period covers annual data from 1960 to 1998. The raw data are collected from *World Tables*, World Bank (*Dx*-database). The plots of these series are cited in Figure 2. Virtually, no significant structural break is observed, and a co-moving relationship among three series can be observed easily.

Figure 2
Log of Real Bank Lending (LB), Real Exports (LE) and Real GDP (LY)



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:

$$\Delta LnY_t = b_0 + \sum_{i=0}^{l} b_{1i}\Delta LnB_{t-1} + \sum_{i=1}^{l} b_{2i}\Delta LnY_{t-i} \quad (6)$$
$$+ b_3 LnY_{t-1} + b_4 LnB_{t-1} + error\_term$$

where Y (left-hand side) is the dependent variable, real GDP, and B is the independent variable, volume of bank lending. Δ is first difference operator, $X_t - X_{t-1}$. 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 LnY_{t-1} and LnB_{t-1}. It is a joint significance testt (Wald test) for the null of no cointegrating relation (H_0:$b_3 = b_4 = 0$), against the alternative hypotheses for a cointegrating relation (H_A : $b_3 \neq 0$, $b_4 \neq 0$). Under the conventionally used significance level α = 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 (α=10%) short run variables (in first difference form) sequentially (see Tang, 2002a). It was also en-

sured that the estimated residual series of the final UECM was white noise and normally distributed. The estimated final UECM for Equations (1) and (2) (bivariate framework) and (3) to (5) (trivariate framework) are as reported in Table 1 and Table 2.

Table 1
Estimated Final UECMs (Bivariate specification – *Ln*B and *Ln*Y)

Dependent Variable:	UECM (1) ΔLnY	UECM (2) ΔLnB
ΔLnB	0.189**	
ΔLnB(t-2)	-0.156***	
ΔLnB(t-3)		-0.191
ΔLnY		0.687**
ΔLnY(t-1)	0.477***	-0.599
ΔLnY(t-2)		0.886
ΔLnY(t-3)	0.213	-0.718
*Ln*B(t-1)	0.095	-0.198
*Ln*Y(t-1)	-0.198	0.389
Constant	0.560***	-0.896
R-squared:	0.277	0.386
F-Statistic (p-value):	1.79 (0.137)	2.426 (0.046)
Q-Statistics (16):	White noise	White noise
Jarque-Bera (p-value):	8.514 (0.014)	0.573 (0.751)
Bounds Test:		
F-statistic:	1.438	1.688
Critical bounds (10%)#:		
lower and upper	4.04 and 4.78	4.04 and 4.78
Conclusion:	Not cointegrated	Not cointegrated

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

From Table 1, the computed test statistics (Bounds test) for UECMs (1) and (2) are 1.438 and 1.688 respectively, and both statistics lie below the lower bound, 4.04, at 10 per cent significance level.[6] Thus, the null of no cointegration cannot be rejected, implying that there was no long run relationship between bank lending and real GDP. This finding runs contrary to that found in the previous study by Tang (2000), which was that a long run relationship between these series was found using the Engle-Granger (1987) approach (see footnote 2 in this study), and the statistical significance of error correction term. However, this is not surprising, as Mah (2000) had stated that the conversional uses of

cointegration approaches (like Engle and Granger, 1987) are inappropriate 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 – *Ln*B, *Ln*Y and *Ln*E)

Dependent Variable:	UECM (3) ΔLnY	UECM (4) ΔLnB	UECM (5) ΔLnE
ΔLnY		1.167*	1.137*
ΔLnY(t-1)	0.819*	-1.494**	-0.833**
ΔLnY(t-2)	-0.607**	0.833	1.193*
ΔLnY(t-3)	0.306	-1.224**	
ΔLnB	0.174**		-0.184
ΔLnB(t-1)			-0.188***
ΔLnB(t-2)			-0.250**
ΔLnB(t-3)		-0.164	-0.169***
ΔLnE	0.426*	-0.362	
ΔLnE(t-1)	-0.119	0.366	
ΔLnE(t-2)	0.276**		-0.540*
ΔLnE(t-3)		0.313	
LnY(t-1)	-0.260	1.374*	0.080
LnB(t-1)	0.080	-0.455*	0.023
LnE(t-1)	0.056	-0.357*	-0.057
Constant	0.615	-2.957*	-0.065
R-squared:	0.692	0.609	0.752
F-Statistic (p-value)	5.396 (0.000)	3.25 (0.01)	6.343 (0.000)
Q-Statistics (16):	White noise	White noise	White noise
Jarque-Bera (p-value):	0.66 (0.719)	1.06 (0.587)	0.074 (0.964)
Bounds Test:			
F-statistic:	3.699	4.761	7.274
#Critical band (10%): lower and upper	3.17 and 4.14	3.17 and 4.14	3.17 and 4.14
Conclusion:	Inconclusive	Cointegrated	Cointegrated

*, **, *** 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),

implying the null of no cointegration can be rejected. Thus, it can be concluded that there was a stable long run relationship between real output, volume of banks lending, and exports by normalized bank lending and the exports variables, respectively. For UECM (3), the *F*-statistic (3.699) had fallen between the 10 per cent significance level of upper-lower bounds, 3.17-4.17, thus inconclusive. The previous studies (Tang, 2000; Tang, 2002a) documented that bank lending, real GDP and exports for Malaysia were nonstationary, or I(1). The summary of estimated long run and short run elasticities for Equations (1) to (5) are reported in Table 3.

Table 3
Summary of Elasticities

	Bivariate:		Trivariate:		
Dependent Variable:	ΔLnY	ΔLnB	ΔLnY	ΔLnB	ΔLnE
Long-run:					
LnY	-	NL	-	3.019	1.399
LnB	NL	-	NL	-1.000	0.397
LnE	-	-	NL	-0.785	-1.000
Short-run:					
$\sum\Delta Ln$Y	-	0.687	-	-1.55	1.4920
$\sum\Delta Ln$B	0.034	-	0.174	-	-0.6078
$\sum\Delta Ln$E	-	-	0.702	n.s	-

n.s is not significant at the 10% level. Short run elasticity is the total of first differenced variables significant at least at the 10% level (Wald test). NL is no long run relationship (not cointegrated). The long run elasticity is calculated by the coefficient of lagged one period desired variable divided by the coefficient of lagged one period level of dependent variable and times a minus sign (Bardsen, 1989).

CONCLUDING REMARKS

The paper has re-examined the long run and short run relationships between real activity and bank lending in Malaysia. Contrary to the findings in a previous study in Tang (2000), it was found that there was no long run relationship between Real Gross Domestic Product and volume of bank lending. However, a cointegrating relationship was found by including exports variable. The results can be explained through the bias of omission variable of using bivariate specification (see Al-Yousif, 1999). The implications of the present study are that

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 elaticities 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).

3 The model regressing growth of total RGDP on marginal productivity of capital in the real sector; labor force growth; growth of monetary sector output (M1, M2 and credit to private sector); and real sector's output with respect to the monetary sector output

4. Most of the literature on the role of financial intermediation in economic growth, particularly for developing countries are cited in Odedokun (1999), Appendix: Table 5, page 236-238. For example, Jao (1976), Wai (1980), Fritz (1984), and Gupta (1986).

5. For more details on its theoretical framework, see Levine (1997).

6 The 10 per cent significance level for cointegrating test (bounds test) was used because this study had used a small sample covering annual data from 1960 to 1998 (39 observations).

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