This paper examines the extent to which financial development contributes to output expansion in Malaysia, during the period 1960–2003. An augmented neoclassical growth framework is adopted to provide an evaluation of the impact of financial sector development on economic development. Using the recently developed ARDL bounds procedure, the results show that aggregate output and its determinants are cointegrated in the long run. The results suggest that financial development, private capital stocks and the labour force exert a positive impact on economic development whereas the accumulation of public capital appears to curtail output expansion in the long run.

Keywords: Financial development; Malaysia; ARDL bounds test.

JEL codes: E44; O11; O16; O53

1 Introduction

The important role of financial development in the process of economic development has long been recognised in the literature. Schumpeter (1911) contended that entrepreneurs require credit in order to finance the adoption of new production techniques. Banks were viewed as key agents in facilitating these financial intermediating activities and promoting economic development. Hence, well-developed financial systems could channel financial resources to the most productive use. The notable early works on finance and development along the Schumpeterian lines included Gurley and Shaw (1955), Goldsmith (1969), and Hicks (1969). They argued that the development of a financial system is crucially important in stimulating economic growth. Under-developed financial systems retard economic growth. The policy implication of this viewpoint is that it is important to formulate policies aimed at expanding the financial system in order to foster growth. However, this view had little impact on development policy making in the early post-war decades, partly because it was not presented in a ‘formal’ manner, and partly because of the dominant influence of the Keynesian ‘financial repressionist’ ideology.

In the 1970s, the applicability of the Keynesian view to analysing the role of financial intermediaries and financial markets in the development process was cogently challenged by McKinnon (1973) and Shaw (1973). The McKinnon model assumed that
investment in a typical developing economy is mostly self-financed. Given its ‘lumpy’ nature, investment cannot materialise unless sufficient savings are accumulated in the form of bank deposits. Such a complementary role between money and physical capital is termed the ‘complementarity hypothesis’. On the other hand, the ‘debt-intermediation’ view presented by Shaw (1973) postulated that financial intermediaries promote investment and raise output growth through borrowing and lending. These two arguments suggest that a higher level of financial development, which can be the result of financial liberalisation, will lead to increased output growth.

Following the evolution in the ‘growth literature’ in the 1980s, more complex types of financial development models incorporating financial institutions into endogenous growth models emerged in the early 1990s (see, e.g., Bencivenga and Smith, 1991; King and Levine, 1993b; Pagano, 1993). Various techniques, such as externalities and quality ladders, were employed to model financial intermediation explicitly rather than taking it for granted as in the McKinnon–Shaw framework. These models supported the finance-led argument by demonstrating that financial development reduces informational frictions and improves resource allocation efficiency.

Empirical studies on this subject burgeoned in the 1990s, following the prominent work of King and Levine (1993a). They studied 80 countries over the period 1960–1989 by controlling for other factors that affect long-run growth. Their results implied that the initial level of financial development is a good predictor of the subsequent rates of economic growth. Subsequent studies by Benhabib and Spiegel (2000), Levine, Loayza and Beck (2000) and Rioja and Valev (2004) point to the same conclusion that financial development has a positive impact on economic growth. However, these broad comparative analyses conducted at the aggregate level are unable to account for the complexity of the financial environment and specific institutional context of each individual country. Hence, the present study aims to supplement the cross-country analyses by providing further evidence derived from a Malaysian case study.

It is interesting to take Malaysia as a case study for several reasons. First, with rapid economic growth following the industrial transformation that took place in the 1970s and 1980s, Malaysia has evolved in recent years to become a leading country in the developing world. Accompanying this development there has been a significant improvement in its financial system. In fact, measured by private credit/GDP, Malaysia had one of the highest levels of financial development in the world in 2000, following only the United States, Japan, Cyprus, Switzerland, and Hong Kong. Second, Malaysia has a rich history of financial sector reform. Various financial restructuring programmes that have aimed to achieve a better financial system have been launched since the 1970s. However, there is little empirical evidence that provides policy makers with information as to whether these reforms have had any impact on the financial system, and hence on economic development (Ang and McKibbin, 2007).

2 Finance and Growth: The Malaysian Experience

This section provides an overview of Malaysia’s financial development and economic growth experience, which can be separated into five distinct phases: (1) the early post-independence period (1957–1970); (2) the soaring 1970s; (3) the structural adjustment period in the 1980s; (4) investment booms in the 1990s; and (5) the Asian financial crisis and the recovery period (1997–2003), as illustrated in Figure 1.
During the post-independence era, Malaysia provided a fundamentally sound environment for investment. This was based on a rich natural resource base, the ample availability of financial resources due to a sizeable presence of foreign banks, the supply of a relatively well-trained labour force, and the provision of an adequately developed infrastructure base. These factors, together with the presence of a large plantation sector, were important in generating rapid industrial growth in the 1960s, which had a far-reaching impact on economic development for the next two decades. Real GDP growth accelerated from –0.1% in 1957 to a respectable +7.8% in 1966, but slowed slightly to 6.0% in 1970. Economic growth in the 1960s was accompanied by an improvement in living standards, better access to health and education, and a higher level of urbanisation (Yusof, Hussin, Alowi, Lim and Singh, 1994).

The 1970s marked a significant improvement in the performance of the manufacturing sector. During the period 1971–1980, the manufacturing sector grew by an average annual rate of 22.9%, accounting for 21.6% of GDP in 1980. This was underpinned by a boom in export-oriented and labour-intensive industries, such as electronics, textiles, and wool products. This impressive performance was largely the result of government efforts in attracting and promoting export-oriented industries through the establishment of free-trade zones from the early 1970s. The ratio of private credit to GDP increased more than two-fold from 21.2% to 49.1% during the same period. The economy grew strongly at an average annual rate of 7.9% due to the exceptional performance of these industries.

However, the performance of the economy was severely affected by the oil crisis that led to the world recession of 1975. Real GDP growth declined sharply from 8.3% in 1974 to 0.8% in 1975. Inflation increased rapidly from 3.2% in 1972 to 17.3% in 1974.
The Government responded to this marked decline in growth by massive spending on public investment projects. Average public investment spending grew nearly three-fold between the periods 1971–1975 and 1976–1980, providing a catalyst for economic recovery. As a result, the growth rate in terms of real GDP had rebounded to 9.3% by 1979.

The GDP in the 1980s registered an average annual growth rate of 6.0%, about two percentage points lower than the previous decade. This was mainly due to a sharp fall in commodity prices, following a prolonged global economic recession in the early 1980s. By the end of 1982, the Government faced a twin deficit problem: a fiscal deficit at 18% of GNP and a current account deficit at 14% of GNP. In view of these problems, external borrowing was sought, resulting in a significant increase in external debt from RM 10 billion (19.5% of GNP) in 1980 to RM 24.3 billion (40.7% of GNP) at the end of 1982 (Othman, 1987).

The economy entered a recession when the prices of several of the main export commodity prices collapsed in 1985. Total export income fell by 1.6% and 6.2% in 1985 and 1986 respectively. This had an adverse impact on the economy, with deflation and a dramatic fall in share prices and property prices. As a result, the real GDP contracted by 1%. The ratio of private credit to GDP fell from a peak of 99% in 1986 to 65% in 1989. However, following an improvement of external conditions that led to a spectacular performance in the export sector, the economy recovered rapidly from 1987, achieving an annual growth rate of more than 9% in the period 1988–1990.

The 1990s saw exceptional growth in the Malaysian economy, with an annual average growth rate of 9.6% during the period 1991–1996. This strong growth was mainly due to active promotion of the private sector as the main driver of economic development. Alongside this development, there was a massive influx of foreign direct investment (henceforth FDI), where the average ratio of FDI to GDP increased two-fold from 3.3% during the period 1981–1990 to 6.6% during the period 1991–1996. The share of FDI in total investment reached a record high of about 23% in 1992. This remarkable increase in FDI was partly due to the Government’s decision to grant attractive FDI incentives, including, among others, location incentives, tax allowances, and double tax deduction for the promotion of exports.

The performance of the Malaysian economy was severely affected in the wake of the Asian financial crisis, which led to a corresponding decline in the growth rate of the GDP. In 1998, the economy recorded a negative growth rate of 7.4%. From 1997 to 2003, the average annual real GDP growth rate was much lower, at 3.5%. Various macroeconomic and financial sector policies were formulated to deal with the situation and the economy recovered quite quickly so that in 1999 the real GDP grew by 6.1% as compared with the previous year. The growth rate faltered to just 0.3% during the world trade recession in 2001. In the subsequent two years, the economy grew at an average rate of 4.7%. However, the ratio of private credit to GDP has been on a downward trend since the Asian financial crisis.
3 Model and Data

The empirical specification draws upon the standard neoclassical model, augmented with financial development. Capital stocks are decomposed into private and public capital stocks. The segregation of total capital stocks is important since private and public capital stocks may have different effects on output expansion, as highlighted by a number of authors (see, e.g., Aschauer, 1989a, 1989b; Holtz-Eakin, 1994). Private capital stocks, which arise from investment in the private sector, such as machinery and equipment, are likely to play a positive role in enhancing growth through the adoption of new technologies in the production process. Aschauer (1989a) has argued that public sector capital, such as infrastructure, may complement private sector capital and thereby contribute positively to output expansion. However, if the public sector is associated with waste and inefficiency, this may affect the quality of public infrastructure and retard output growth. Hence, the impact of public capital stocks on economic development is ambiguous.

The above theoretical considerations lead to the formulation of an empirical specification of the aggregate output, given in Equations (1) and (2).

Model A: \( ED_t = f_A(\text{PRK}_t, \text{PUK}_t, \text{LF}_t, \text{PCK}_t) \) \hspace{1cm} (1)

Model B: \( ED_t = f_B(\text{PRK}_t, \text{PUK}_t, \text{LF}_t, M2Y_t) \) \hspace{1cm} (2)

where economic development \( (ED_t) \) is GDP measured at 1987 prices and the independent variables, with the expected signs in the parentheses, are given as:

- \( \text{PRK}_t \) = real private capital stocks (+)
- \( \text{PUK}_t \) = real public capital stocks (?)
- \( \text{LF}_t \) = labour force (+)
- \( \text{PCY}_t \) = financial development measured by the ratio of private credit to GDP (+)
- \( M2Y_t \) = financial development measured by the ratio of M2 to GDP (+).

Included in the above specifications are two dummy variables to account for the effect of the global economic recession in 1985–1986 and the 1997–1998 Asian financial crisis, defined as follows:

\[
D_{85-86} = \begin{cases} 
1 & \text{if } t = 1985-1986 \\
0 & \text{otherwise} 
\end{cases}
\]

\[
D_{97-98} = \begin{cases} 
1 & \text{if } t = 1997-1998 \\
0 & \text{otherwise} 
\end{cases}
\]

The Department of Statistics (1965, p.16) estimated capital stocks in 1954 to be in the range of RM 6,000–7,000 million. Since no estimate is available for 1960, the upper limit of RM 7,000 million is taken to be the initial level of capital stocks for Malaysia in 1960. It is assumed that capital stocks in Malaysia have an average life of twenty years and therefore depreciate at the rate of 5% per annum. Capital stocks \( (K_t) \) can be calculated using the standard perpetual inventory model as follows:

\[
K_t = (1 - \delta)K_{t-1} + GCF_t, \quad (3)
\]

where the depreciation rate \( (\delta) \) is assumed to be 5%, and \( GCF_t \) refers to gross capital formation.
The computation of real private capital stocks \((PRK_t)\) and real public capital stocks \((PUK_t)\) deserves some explanation. First of all, the initial level of physical stocks of RM 7,000 million in 1960 needs to be split. The share of private and public fixed capital formation in total fixed capital formation over the period 1960–2003 is used as the basis of segregation in this study. The computation shows that private fixed capital formation contributes an average of 60% to the total fixed gross capital formation. Thus, \(PRK_t\) and \(PUK_t\) in 1960 are found to be RM 4,200 million and RM 2,800 million, respectively. These two series are deflated by the gross capital formation deflator to get equivalent values in real terms.

Following the definition of the World Bank, the total labour force \((LF_t)\) refers to all individuals willing to supply labour for the production of goods and services in a specified period. It comprises both the employed and the unemployed. The labour force includes the armed forces, unemployed individuals, and first-time job-seekers, but excludes homemakers and other unpaid workers in the ‘informal sector’. The standard practice in the literature is followed in the present study by using the ratio of private credit to GDP \((PCY_t)\) and the ratio of M2 to GDP \((M2Y_t)\) as proxies for financial development (see, e.g., Demetriades and Luintel, 1997; Ang and McKibbin, 2007).

Annual data for the period 1960–2003 were used in the analysis. Most of the data series were obtained directly or compiled from Malaysian sources, including the Annual Reports of Bank Negara Malaysia (BNM), Money and Banking in Malaysia (1994) of BNM, and the Monthly Statistical Bulletin of BNM. Some series were obtained from World Development Indicators (2005) and International Financial Statistics (2005). All data series were measured in natural logarithms, meaning that they can be interpreted in growth terms after taking the first difference.

4 Econometric Methodology

The ARDL bounds test is used to establish the existence of a long-run relationship between aggregate output and all its determinants. Pesaran and Shin (1998) have shown that the OLS estimators of the short-run parameters are consistent and the ARDL-based estimators of the long-run coefficients are super-consistent in small sample sizes. Hence, valid inferences on the long-run parameters can be made using standard normal asymptotic theory, once standard errors have been appropriately adjusted. Furthermore, Pesaran, Shin and Smith (2001) show that the ARDL approach yields consistent and asymptotically normal estimates for the long-run coefficients regardless of whether the underlying variables are \(I(0)\) or \(I(1)\). Hence, this approach allows for the specification of a combination of stationary and non-stationary variables.

To illustrate the procedure, consider the steady-state output function in Equation 1. Accordingly, the ARDL model can be formulated as:

\[
\Delta ED_t = \alpha_t + \beta_t ED_{t-1} + \sum_{j=1}^{p} \beta_j DET_{t-j+1} + \sum_{j=1}^{m} \gamma_j \Delta ED_{t-j+1} + \sum_{j=1}^{m} \gamma_j \Delta DET_{t-j+1} + \epsilon_t
\]

where \(ED_t\) is aggregate output, \(DET_t\) is a vector of \(k\) determinants of output, which includes \(PRK_t\), \(PUK_t\), \(LF_t\), and \(PCY_t\). Two separate statistics are employed to ‘bounds test’ for the existence of a long-run relationship: (1) an \(F\)-test for the joint significance of the coefficients of the lagged terms of the conditional error correction model
I adopt the unrestricted ECM estimator proposed by Inder (1993) to estimate the long-run equilibrium relationship. This involves estimating the long-run parameters by incorporating adequate dynamics into the specification, as given in Equation 5.

$$ED_t = \alpha_0 + \sum_{j=1}^{k} \beta_j DET_{t,j} + \sum_{i=0}^{p} \gamma_i \Delta ED_{t,i-1} + \sum_{j=1}^{k} \delta_j \Delta DET_{t,j-1} + \epsilon_t$$

(5)

I then follow the instrumental variable (IV) approach of Bewley (1979) by using the first lags of the variables as instruments for the current differenced terms in order to obtain valid standard errors and draw valid inferences from the estimated results. The long-run model for $ED_t$ can be obtained from the reduced form solution of Equation 5, when all differenced terms of the regressors are set to zero, i.e., $\gamma_i = \delta_j = 0$ for $i = 0, 1, \ldots, p$ and $j = 1, 2, \ldots, k$. Thus, one obtains the following steady-state solution:

$$ED_t = \alpha_0 + \beta DET_{t} + \beta_1 DET_{t-1} + \ldots + \beta_k DET_{t-k}$$

(6)

Having obtained this long-run relationship, the error-correction term (ECT) can be obtained by taking $ED_{t-1} - \alpha_0 - \beta DET_{t-1} - \ldots - \beta_k DET_{t-k-1}$ to formulate an ECM. The ECT captures the output evolution process by which agents adjust for prediction errors made in the last period. Hendry’s (1995) general-to-specific modelling approach is adopted to derive a satisfactory short-run dynamic model for the output equation. This involves ‘testing down’ the general model by successively eliminating statistically insignificant regressors and imposing data acceptable restrictions on the parameters to obtain the final parsimonious dynamic equation.

5 Results

Three unit root tests were used to assess the order of integration of the variables. The Augmented Dickey–Fuller (ADF) and the Phillips–Perron (PP) test the null hypothesis of a unit root against the alternative of stationarity, while the Kwiatkowski–Phillips–Schmidt–Shin (KPSS) tests the null of stationarity against the alternative of a unit root. The choice of the KPSS test is to complement the widely employed ADF and PP tests. This is motivated by the argument that the ADF and PP tests, which are designed based on the null hypothesis that a series is non-stationary, have low power of rejecting the null. Since most economic time-series are not very informative about whether or not there is a unit root, it would be useful to perform tests of the null hypothesis of stationarity as well as tests of the null hypothesis of a unit root (Kwiatkowski, Phillips, Schmidt and Shin, 1992). On that basis, the results in Table 1 show that none of the variables appears to be integrated at an order higher than one, allowing legitimate use of the ARDL bounds procedure.

An ARDL model is estimated with one and two lags for each model to perform the bounds tests. The results in Table 2 indicate that the null hypothesis of no long-run relationship for the output equation is rejected at the 5% significance level for both models when one lag is chosen. In accordance with the results of the bounds test, both AIC and SBC prefer a simpler dynamic specification of one lag for Model A. For Model B, the results show that AIC favors modelling with two lags whereas SBC point to
specifying the model with only one lag. The results are not surprising, given that SBC always tends to select a model with less dynamics.

TABLE 1
TEST RESULTS FOR UNIT ROOTS

<table>
<thead>
<tr>
<th></th>
<th>ADF</th>
<th>PP</th>
<th>KPSS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>level</td>
<td>1st diff</td>
<td>level</td>
<td>1st diff</td>
</tr>
<tr>
<td>GDP</td>
<td>-3.888**</td>
<td>-5.472***</td>
<td>-2.074</td>
<td>-5.440**</td>
</tr>
<tr>
<td>PRK</td>
<td>-2.784</td>
<td>-4.289***</td>
<td>-1.082</td>
<td>-4.244***</td>
</tr>
<tr>
<td>PUK</td>
<td>-2.056</td>
<td>-4.515***</td>
<td>-1.901</td>
<td>-4.466***</td>
</tr>
<tr>
<td>LF</td>
<td>-2.071</td>
<td>-2.332*</td>
<td>-1.389</td>
<td>-2.390*</td>
</tr>
<tr>
<td>PCY</td>
<td>-1.787</td>
<td>-7.463***</td>
<td>-1.787</td>
<td>-7.452***</td>
</tr>
<tr>
<td>M2Y</td>
<td>-2.472</td>
<td>-7.103***</td>
<td>-2.472</td>
<td>-7.361***</td>
</tr>
</tbody>
</table>

Notes: For ADF, AIC is used to select the lag length and the maximum number of lags is set to be five. For PP and KPSS, Barlett–Kernel is used as the spectral estimation method. The bandwidth is selected using the Newey–West method. *, ** and *** indicate 10%, 5% and 1% level of significance respectively.

TABLE 2
ARDL BOUNDS TESTS AND LAG LENGTH SELECTION

<table>
<thead>
<tr>
<th></th>
<th>Model A</th>
<th></th>
<th></th>
<th>Model B</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P = 1</td>
<td>P = 2</td>
<td>P = 1</td>
<td>P = 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARDL bounds tests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>5.772***</td>
<td>3.472</td>
<td>4.377***</td>
<td>3.023</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-statistic</td>
<td>-4.672***</td>
<td>-2.278</td>
<td>-4.025**</td>
<td>-2.059</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lag length selection criteria</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIC</td>
<td>-4.417</td>
<td>-3.755</td>
<td>-4.401</td>
<td>-4.448</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SBC</td>
<td>-4.536</td>
<td>-3.659</td>
<td>-3.739</td>
<td>-3.570</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Model A uses private credit to GDP (PCYt) whereas Model B uses M2 to GDP (M2Yt) as the proxy for financial development. \( p \) is the optimal lag length for the conditional ECM. \( AIC = -2ll/T + 2k/T \) and \( SBC = -2ll/T + (k/T)(lnT) \), where \( ll \) is the maximised log-likelihood value of the model at lag \( p \), \( k \) is the number of estimated coefficients, and \( T \) is the sample size. The test statistics of the bounds tests are compared against the critical values reported in Pesaran, Shin and Smith (2001). The dependent variable is economic development (EDt). No co-integration is found when other variables are specified as the dependent variables. *, **, and *** indicate 10%, 5%, and 1% levels of significance, respectively.
### TABLE 3
**LONG-RUN AND SHORT-RUN RESULTS OF THE OUTPUT EQUATIONS**

#### A. The long-run equilibrium level relationship (Dep. = ED_t)

<table>
<thead>
<tr>
<th></th>
<th>Model A</th>
<th>Coefficient</th>
<th>p-value</th>
<th>Model B</th>
<th>Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>7.629***</td>
<td>0.000</td>
<td>7.791***</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRK_t</td>
<td>0.378***</td>
<td>0.000</td>
<td>0.388***</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUK_t</td>
<td>-0.322***</td>
<td>0.000</td>
<td>-0.281***</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LF_t</td>
<td>1.674***</td>
<td>0.000</td>
<td>1.329***</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCY_t</td>
<td>0.096***</td>
<td>0.001</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2Y_t</td>
<td>--</td>
<td>--</td>
<td>0.334***</td>
<td>0.007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D85–86</td>
<td>-0.097***</td>
<td>0.000</td>
<td>-0.060***</td>
<td>0.030</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### B. The short-run dynamic model (Dep. = ΔED_t)

<table>
<thead>
<tr>
<th></th>
<th>Model A</th>
<th>Coefficient</th>
<th>p-value</th>
<th>Model B</th>
<th>Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.044**</td>
<td>0.024</td>
<td>-0.013</td>
<td>0.440</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECT_t–1</td>
<td>-0.661***</td>
<td>0.000</td>
<td>-0.544***</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔPRK_t</td>
<td>0.817***</td>
<td>0.000</td>
<td>0.824***</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔPUK_t</td>
<td>-0.691***</td>
<td>0.000</td>
<td>-0.628***</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔPRK_t–1</td>
<td>-0.489***</td>
<td>0.000</td>
<td>-0.421***</td>
<td>0.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔPUK_t–1</td>
<td>0.632***</td>
<td>0.000</td>
<td>0.496***</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Diagnostic checks

<table>
<thead>
<tr>
<th></th>
<th>Test-statistic</th>
<th>p-value</th>
<th>Test-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>χ^2.NORMAL(2)</td>
<td>4.963</td>
<td>0.084</td>
<td>3.557</td>
<td>0.169</td>
</tr>
<tr>
<td>χ^2.NORMAL(1)</td>
<td>0.538</td>
<td>0.463</td>
<td>0.119</td>
<td>0.731</td>
</tr>
<tr>
<td>χ^2.SERIAL(2)</td>
<td>3.555</td>
<td>0.169</td>
<td>2.685</td>
<td>0.261</td>
</tr>
<tr>
<td>χ^2.SERIAL(1)</td>
<td>0.937</td>
<td>0.333</td>
<td>0.930</td>
<td>0.335</td>
</tr>
<tr>
<td>χ^2.ARCH</td>
<td>14.046</td>
<td>0.371</td>
<td>15.989</td>
<td>0.142</td>
</tr>
</tbody>
</table>

Notes: χ^2.NORMAL(2) refers to the Jarque–Bera statistic of the test for normal residuals, χ^2.SERIAL(1) and χ^2.SERIAL(2) are the Breusch–Godfrey LM test statistics for no first- and second-order serial correlation, respectively, χ^2.ARCH(1) is the Engle’s test statistic for no autoregressive conditional heteroskedasticity, and χ^2.WHITE denotes the White’s test statistic to test for homoskedastic errors, with degrees of freedom equal to the number of slope coefficients. *, **, and *** indicate 10%, 5% and 1% levels of significance respectively.

In Table 3, the results associated with the long-run equilibrium relationships show that all variables are statistically significantly at the 5% level. The signs of the coefficients appear to be plausible. Specifically, the results show that capital stocks have a mixed influence on output expansion. A 1 percentage point increase in private capital stocks leads to a 0.378 to 0.388 percentage point increase in output, whereas a 1
percentage point increase in public capital stocks leads to a 0.281 to 0.322 percentage point reduction in output. The finding of a negative effect of public capital stocks is consistent with the results of Ang (2006) for the Malaysian experience, where a negative elasticity of private investment was found with respect to public investment. Therefore, the results imply that the public sector in Malaysia is not efficient in expanding output. Labour input is found to have a positive impact on aggregate output, with a long-run elasticity of 1.674 for Model A and 1.329 for Model B. The results seem to suggest that a high growth rate in the labour force is conducive to economic development in Malaysia.

The elasticity of output with respect to financial development is found to be 0.096 in Model A, suggesting that the influence of financial development on output is quite small when financial development is measured by private credit to GDP. This impact is found to be much larger in Model B (which measures financial development using M2/GDP), with a long-run elasticity of 0.334. The finding that financial development positively influences economic development is consistent with the results of Ang (2007b) for the Malaysian experience. The results are also broadly in line with the cross-sectional findings of King and Levine (1993a), Benhabib and Spiegel (2000), Levine, Loayza and Beck (2000) and Rioja and Valev (2004).

The results lend some support to the endogenous financial development and growth theory, which postulates that financial development facilitates the adoption of new technologies in the domestic economy. Thus, the provision of efficient credit and financial services by the Malaysian financial system appears to have greatly facilitated technological transfer and induced spillover efficiency. Given that evolution of the financial system may affect the speed of technological accumulation and innovations, it is essential to develop a sound financial system in order to reap these efficiency gains and achieve sustained economic growth in the long-run.

The coefficient on $D_{85-86}$ is found to be negative, implying that the world economic recession in 1985–1986 had a negative impact on output. The dummy variable which captures the effect of the Asian financial crisis, i.e., $D_{97-98}$, is found to be statistically insignificant, and is therefore dropped from the estimation.

Interestingly, the short-run impacts of $PRK_t$ and $PUK_t$ on $ED_t$ are consistent with the long-run results. No short-run inference about the relationship between the labour force and financial development can be drawn, since in first-differenced forms these variables are found to be statistically insignificant. Hence, financial development does not seem to foster economic growth in the short-run. The coefficient associated with $ECT_{t-1}$ is statistically significant at the 1% level and has the appropriate sign. Its magnitude implies that the economy takes less than two years to achieve long-run equilibrium whenever there is a deviation from equilibrium. The statistical significance of this error-correction term also provides further evidence against no co-integration between aggregate output and its determinants. The regression results for the conditional ECM of $ΔED_t$ show several desirable statistical features. The regression specification fits remarkably well and passes the diagnostic tests against non-normal residuals, serial correlation, heteroskedasticity, and autoregressive conditional heteroskedasticity at the 5% level of significance.
6 Concluding Remarks

This paper has analysed the role of financial deepening in the process of economic development in Malaysia over the last few decades. Co-integration results based on the ARDL bounds procedure show a fairly robust long-run relationship between aggregate output and its determinants - private and public capital stocks, labour force and financial development. There is evidence that an improvement in the financial system leads to higher economic development in the long run. No short-run effect of financial development is found. The results suggest that an improvement in the financial system has the potential to play an important role in stimulating long-run growth by facilitating the adoption of new technology.

REFERENCES


