Financial development and economic growth in Malaysia: Cointegration and Co-feature analysis

Roshaiza Taha*, Sisira R.N. Colombage, Svetlana Maslyuk†

Abstract:
This study seeks to explore the relationship between financial development and economic growth in Malaysia over the period of 1980 to 2008 using the Kuala Lumpur Composite Index (KLCI) and the Index of Industrial Production (IIP). Focusing on long term relationship, this investigation is carried out within the Granger causality and vector error correction model (VECM). The empirical results data suggest the existence of the long-run equilibrium relationship between financial development and economic growth in Malaysia. The causality between economic growth and stock market was found to mutually causal, that is the causality is bi-directional. This finding suggests that a strong stock market is a good channel to foster economic growth of the country. At the same time, strong growth of economy helps to promote the development of the stock market in Malaysia. Therefore it is vital for the Malaysian government to formulate policy that will enhance the efficiency of the financial system to stimulate the stock market and further boost up the growth of economy.

Keywords: stock market, economic growth, Malaysia, causality, VECM

*Corresponding author. E-mail: Roshaiza.Taha@buseco.monash.edu.au
† School of Business and Economics, Monash University Northways Road, Churchill, Victoria Australia 3842

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1. Introduction and background

Malaysia had experienced positive economic growth for the past two decades where its economic performance for the sixth consecutive year can best be described as strongly growing with above 5% expansion each year. This growth was accompanied by stable prices, low unemployment rate, moderate wage increases, a continually large current-account surplus and a slight decline in the country’s fiscal deficit. The introduction of the five year plans since 1955 by the government has helped to boost the economy. The Malaysia Plan is a comprehensive five-year blueprint detailing the country's economic growth and national budget allocation for all economic sectors of the country. Results have shown that this plan has facilitated the recovery of Malaysia’s economics from a few recession periods. The plan covers the future planning for Malaysia in all aspects pertaining to the financial sector (Malaysia, 2006).

The development of the financial sector is crucial to drive the development of the economy, especially for Malaysia, which has being classified as a newly industrialized country (NIC). Therefore, it is important for Malaysia to keep abreast of the development and changes in other countries as well as improving its own economic performance. With the growing integration and complications of the worldwide financial system, the challenge for the Malaysian financial system is to cope with the changing market. The government will continue to ensure a conducive environment for economic development. Attractive investment incentives, a productive workforce and political stability are strong points for the nation, as they can lead to sustained growth in the inflow of investments into the economy. Moreover, Malaysia welcomes investments in a wide range of industrial sub-sectors and investors will find Malaysia a cost-effective country within which to operate in the long run.

The financial industry in Malaysia itself has also emerged as an important source of economic growth, accounting for 10.7% of GDP in 2007 (Malaysia, 2008). The Kuala Lumpur Composite Index (KLCI), which is Malaysian stock market showed tremendous growth for the period of the 1980s and 1990s but a slight decline starting from 2000 onwards. This was due to uncertainty over global economic growth, volatility in financial markets as well as falling commodity prices. Despite the lacklustre market conditions, the stock market remained an important avenue to raise funds. With the abolishment of the Real Property Gains Tax (RPGT) it is expected that property stocks will be boosted and high-end properties in choice locations, which are favoured by foreign buyers, expected to benefit the most from the tax holiday.

One institution that was established to monitor the Malaysian stock market activities are Bursa Malaysia (formerly known as Kuala Lumpur Stock Exchange) which was incorporated on 1976. With just under 1,000 listed companies offering a wide range of investment choices to the world, Bursa Malaysia today is one of the largest bourses in Asia. Companies are either listed on Bursa Malaysia Securities Berhad Main Market (Main Board and Second Board) or ACE Market. Main Market provides an avenue to raise funds for the established company whereas ACE Market is an alternative sponsor-driven market for companies which seek for a expansion platform. Listed companies are falls within nine main sector which include construction, consumer product, finance, industrial product, mining, plantation, property, technology, and trading or services.

KLCI was enhanced as part of Bursa Malaysia’s strategic initiative to ensure the national economy is growing in line with the global economy. Most recent in 2009 Bursa Malaysia together with FTSE International Limited (FTSE), its index partner, has implemented the new enhancements which show the change of the index name from KLCI to FTSE Bursa Malaysia KLCI. With the new enhancement Bursa Malaysia and FTSE incorporated the KLCI with internationally accepted methodology of index calculation which provide a more investable, tradable and transparently managed index. In addition these changes allow Malaysian stock market to offers a wider range of investable and appealing opportunities. Furthermore these changes are vital to foster the growth to the economy.
Recognising the fact, the aim of this study is to examine the stock market-growth nexus in Malaysia. Is the stock market a stimulus for economic growth or does economic growth contributes to the stock market development or two ways direction? For Malaysia, studying the relationship between stock market and economic growth is a vital one, considering the importance of the market to the economy. In addition the evidence from this study will contribute to economic policy about the possible linkages between stock market and economic growth.

Prior studies in this area emphasized on the stock market-growth nexus in advanced economies while disregard the relationship in developing economy. Considering this it is vital to examine this relationship in NIC like Malaysia since the results may vary depending upon the circumstances of the country.

The remainder of this paper is organized as follows. Section 2 discusses the literature review. Section 3 briefly discusses the methodology and data collection procedure. We report our empirical analysis in Section 4. Finally, the paper concludes with the discussion on findings and policy implications.

2. Literature review

The relationship between stock market and economic growth has been the subject of intense research for many years. More specifically these researches has highlighted at the theoretical (Schumpeter, 1912; Robinson, 1952; Solow, 1956; Levine, 1991; King & Levine, 1993) and empirical (Naceur, Ghazouani, & Omran, 2007; Padhan, 2007) level the significant of stock market to support economic growth. However it is arguable as whether the stock market can be the catalyst for future growth or vice versa. This section reviews various papers on both theoretical and empirical between stock market-growth nexus.

2.1 Theoretical issues

Studies on the relationship between finance and economic growth goes far back to the work of Schumpeter (1912), Robinson (1952), McKinon (1973), Shaw (1973), Levine (1991) and King and Levine (1993). There were two schools of thought with differently viewing the important role of finance in foster growth. On the first hand finance is seen as the vital engine to foster growth. Emphasize on the influence of financial sector, Schumpeter claimed that this sector are the major contributor to the growth of an economy. Schumpeter (1912) hold the view that a well functioning financial system would selected and financing businesses that are forecasted to be successful in order to encourage technological innovation. These will later leads to the economic growth of the country.

The link between financial developments and the real economy has also been theoretically conceptualized by McKinon (1973) and Shaw (1973). They claimed that financial markets play a key role in economic activity and highlight a positive association between the financial sector and the real economy. Their views were supported by Levine (1991) and King and Levine (1993). Levine (1991) suggested that a well developed financial system tends to help a country to grow faster. In the model Levine (1991) explains how stock markets influence King and Levine (1993)

Whereas

However Robinson (1952) and Solow (1956) claims that financial system only has minor effect on economic growth. Robinson (1952) argue that finance was essentially the handmaiden to industry, which passively respond to other factors that produced cross-country differences in growth. Solow (1956) considered the rates of saving and population growth to determine the steady-state level of income per capita. However there are difference steady states due the various saving and population growth rates. The higher the rate of saving, the richer the countries, while the higher rate of
population makes the country poorer. In addition Solow (1956) remark the function of technological progress to sustained growth in the long run.

In summary previous theoretical studies has suggested conflicting theory between the finance-growth nexus. This lead to the emergence of empirical studies that attempt to prove the theories. Study related to stock market and economic growth may contribute to the literature on policy impacting growth.

2.2 Empirical evidence

Over the years a large number of empirical studies attempt to prove finance-growth theory. Recent empirical studies (Aghion, Bacchetta, & Banerjee, 1999; Beck, Levine, & Loayza, 2000; Levine, Loayza, & Beck, 2000; Abu-Bader & Abu-Qarn, 2008) tend to proxy financial development by a number of variables. Among such variables are liquid liabilities, money market, and Treasury bill. The proxies for growth tend to include the growth rates of per capita GDP, total productivity and industrial production index (IPI). However with the growing of stock market globally, more researcher focused on the examining the role of stock market towards the economic growth.

Studies that support positive relationship does exist between financial development and economic growth are voluminous. Employing Generalised Methods of Moment (GMM) for panel data analysis Beck and Levine (2004), Adjasi and Biekpe (2006), Hahn (2008) and Saci, Giorgioni and Holden (2009) confirmed the significant positive link between stock market and economic growth. Though the direction of relationship is ambiguous these studies proved that stock markets work as a very important catalyst of economic growth. Beck and Levine (2004) argue that this positive findings is not due to the potential biases occurs through simultaneity, omitted variables or unobserved countries-specific effects. Besides Adjasi and Biekpe (2006) suggest that more attention needed to develop stock market in low income countries to elicit economic gains from stock markets. Adding to this Agrawalla and Tuteja (2007) suggest that the policies related to stock market should be directed towards the creation of transparent and mature stock exchanges. They support the positive relationship does exist between stock market an economic growth in the long run in India.

Naceur, Ghazouani and Omran (2007) and Gentzoglanis (2007), also found the existence of a relationship between financial and economic variables in Middle East and North African (MENA) countries. In addition they indicate that the economic stability does play a significant role in determining stock market capitalization. However, Gentzoglanis (2007) claimed that the direction of causality only exists in high income countries while only a weak relationship could be seen in low income countries. They suggest that low income countries should focused on continuing to work towards the adoption of more market oriented mechanisms and adopt policies favoring regional and international integration of their markets. Similarly, Kyereboah-Coleman and Agyire-Tettey (2008), using the Ghana Stock Exchange data, proved that financial development (stock markets) does contribute to economic growth. They emphasize on the importance of implementing prudent macroeconomic policies for a country to benefit from stocks market.

While many studies on stock market and economic growth supported positive nexus few studies attempt to examine the direction of relationship between stock market and economic growth. Padhan (2007) applies recently developed Granger non-causality tests introduced by Toda-Yamamota, Dolado and Lutkepol (popularly known as TYDL) to the monthly data on India from 1991 to 2005. This study found a bi-directional causality between stock price and economic activity, implying that a well developed stock market could enhance economic activity and vice versa.

Handa and Shubha Rahman (2008) point out that the relationship between financial intermediation and growth fall into four hypotheses. These are: uni-directional from financial intermediation to growth, uni-directional relationship from growth to financial intermediation, bi-directional relationship between them and the absence of any relationship. This study employed Granger-causality and Vector Error Correction Model (VECM) test to ascertain the relationship. Annual data from 1960-2002 of banking and stock market to proxy financial development and growth rates of
GDP per capita were utilised in this study. Based on analysis of diversified annual sample of 13 countries causality results are quite mixed: bi-directional relationship does exist for all developed economies, uni-directional relationship from growth to financial development for all low income economies and both for middle-income economies. However there is no evidence on the direction of relationship from financial development and economic growth. Following this Enisan and Olufisayo (2009) examines the long run and causal relationship between stock market development and economic growth for seven countries in sub-Saharan Africa rule out the non-existence of relationship from financial development and economic growth. Employing the autoregressive distributed lag (ARDL) bound test, this study finds that bi-directional causality between stock market and economic growth. This implies that stock market helps to induce economic growth and in turn economic growth stimulate the stock market development. Enisan and Olufisayo (2009) also found weak uni-directional relationship from economic growth to financial market. True, that most studies confirm the existence of a positive relationship between stock market and economic growth. However the important contribution of stock market on economic growth might be exaggerated in the studies of cross section countries (Arestis, 2006). The argument for these is supported by studies (Harris, 1997; Ram, 1999; Arestis, 2006) that proved the weak or negative relationship between stock market and economic growth.

Harris (1997) found that stock market did have an impact on economic growth in less developed countries but very weak for developed countries. This implies that stock market activity does not really help to explain the growth of an economy especially in developed countries. Ram (1999), in conducting a study on 95 individual countries, claimed that the correlation between financial development and economic growth was found to be weakly negative or negligible. It is suggested that future research may include greater focus on individual-country studies to provide accurate result. This view is supported by Arestis (2006) who emphasize the impact of stock market on economic growth are statistically weak in United Kingdom and United States. This implies that capital-market based is not able to promote growth in developed economies.

In analysing the relationship between economic growth and financial market, most studies concentrated on cross section or panel study. Less discussion focuses on individual country-specific sample which may provide deeper analysis as compare to cross-country analysis. Besides Handa & Shubha Rahman (2008) emphasize the importance of having more observations to obtain accurate results from the analysis. Therefore we are motivated to examine the relationship between stock market and economic growth in Malaysia since data on individual analysis provide deeper result Ram (1999).

3. Methodology and data

3.1 The Data

This study utilizes monthly stock market and economic growth data which are proxied by KLCI and the Index of Industrial Production (IIP) respectively which cover the sample period of 1980:1 to 2008:5. Most of the studies (Adjasi & Biekpe, 2006; Abu-Bader & Abu-Qarn, 2008) which tested the relationship of economic growth with stock market have used GDP as a measurement of economic growth. However, this study uses IIP (Agrawalla & Tuteja, 2007; Padhan, 2007) due to the non-availability of monthly GDP data. Data for KLCI is obtained from Bursa Malaysia, Malaysia’s Department of Statistics, International Financial Statistics and Datastream. All data sets expressed in natural logarithm form to preserve homogeneity.
As Figure 1 shows, KLCI has gone through several upward and downwards movements. It is clearly shown that KLCI has strongly affected with 1985 crisis, 1997 East Asian financial crisis and 2008 financial crisis. Whereas, IIP has generally increased throughout the sample period which shows that it is not really influenced by the global economic situation. Table 1 presents the descriptive statistics for the logs of stock market and economic growth variables employed in the empirical analysis. A comparison of means and median indicate that they are very close to each other during the sample period. An examination of skewness indicates that both variables are negatively skewed. That means that the negatively skewed variables have been on increase during the sample period. Kurtosis figure indicates that the data are leptokurtic with negative skewness provide non-normal distributions for all variables. This is supported with the significance of the Jarque-Bera statistic reported in the table. A perusal of ARCH LM test also suggests the presence of ARCH effect.

Table 1: Descriptive statistic for stock market and economic growth

<table>
<thead>
<tr>
<th></th>
<th>LN KLCI</th>
<th>LN IPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>9.4454</td>
<td>3.7468</td>
</tr>
<tr>
<td>Median</td>
<td>9.4924</td>
<td>3.8148</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.5104</td>
<td>0.6840</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.2586</td>
<td>-0.3471</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.0517</td>
<td>1.8231</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>16.5764*</td>
<td>26.5288*</td>
</tr>
<tr>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>ARCH LM test</td>
<td>10.8050*</td>
<td>16.7474*</td>
</tr>
<tr>
<td>(0.000)</td>
<td>(0.000)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Jarque-Bera is the test for normality and ARCH LM test is the test for the presence of ARCH effects in errors. P-values are given in the parenthesis.

3.2 Stationarity

It is important to determine the characteristics of the individual series before conducting the cointegration analysis. An enormous amount of studies have shown that the majority of macroeconomics time series are not stationary but rather stationary with a deterministic trend. This creates a problem for econometricians since in the conditions of non-stationary data the normal properties t-statistics and Durbin Watson statistics (DW), and measures such as R-squares break results. To test the order of integrations, we used the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) tests and Ng-Perron test proposed by (Perron & Ng, 1996), which is useful in empirical work as they are free of the size problems that have plagued many unit root tests.
Table 2 below summarizes the outcome of the ADF, PP and NG-Perron tests for un-filtered data on all the variables in this study. The null hypothesis tested is that the variable under investigation has a unit root against the stationarity alternative. In each case, the lag-length is chosen using the Akaike Information Criteria (AIC) for both the ADF and Ng-Perron test.

3.3 Cointegration Tests

Cointegration between economic variables implies that these series are linked in the long run linear relationship which prevents them from drifting away from each other. More technically, it means that the non-stationary variables are integrated in the same order with the residuals being stationary. First the concept of cointegration was proposed by Granger (1969) proposes, which was further developed by Engel and Granger (1987). This study will employ the Johansen and Juselius (1988) (hereafter JJ) cointegration test.

In general, the components of the vector \( X_t \) are said to be cointegrated of order \( d,b \), and denoted by \( X_t \sim CI(d,b) \) if (i) \( X_t \) is \( I(d) \) and (ii) there exists a non-zero vector \( \alpha \) such that \( \alpha' X_t \sim I(d-b) \), \( d \geq b \geq 0 \). The vector \( \alpha \) is called the cointegrating vector. The JJ cointegration approach suggests an alternative method to perform the cointegration test. The JJ method takes the form of the following equation:

\[
\Delta Y_t = Y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-i} + BX_t + \varepsilon_t \tag{1}
\]

Where, \( \Pi = \sum_{i=1}^{p} A_i - I \), \( \Gamma_i = \sum_{j=i+1}^{p} A_j \), \( Y_t \) is a \( k \)-vector of non-stationary \( I(1) \) variables. \( X_t \) is a \( d \)-vector of deterministic variables, and \( \varepsilon_t \) is a vector of white noise with zero mean and finite variance. The number of cointegrating vectors is represented by the rank of the coefficient matrix \( \Pi \). Johansen’s method is utilised to estimate the \( \Pi \) matrix in an unrestricted form. Further test will be applied to determine whether one can reject the restrictions implied by reducing the rank of \( \Pi \). In making inferences about the number of cointegrating relations, trace statistics and maximal eigenvalue statistic are used which are compared with critical values tabulated in Osterwald-Lenum (1992). It is to be noted that the variables under consideration should have identical orders, and, in particular, are integrated to the order of one (Engle and Granger, 1987).

3.4 Vector Error Correction Models (VECM)

In most cases, the direction of causality between the variables is not known apriory and various tests have been suggested to identify the direction. The most well-known test is the one proposed by Granger (1969). This test, being based on the premise that the future cannot cause the present or the past, utilizes the concept of the Vector Autoregressive model (VAR). In most empirical studies the causality analysis between macroeconomic variables is normally performed in frameworks such as Granger (Baharumshah, Thanoon, & Rashid, 2003; Neelesh, Paresh Kumar, & Arti, 2007), vector autoregressive models (VAR) (S. Johansen, 1991; Hoffman, 2001), vector error correction models (VECM) (Onafowora & Owoye, 1998) and unrestricted error-correction model (UECM) (Tang, 2001).

This study attempts to establish the short term feedback relationships between financial and real sectors using the Granger causality test. The hypotheses are tested in the context of VAR of the following form:

\[
\Delta KLC_{it} = j = 1n \ i \Delta IIP_{t-1} + j = 1n \delta_j \Delta KLC_{it-1} + u_{2t} \tag{2}
\]

\[
\Delta IIP_{t} = i = 1n \gamma_i \Delta IIP_{t-1} + j = 1n \phi_j \Delta KLC_{it-1} + u_{1t} \tag{3}
\]

where, equation (2) suggests that current KLCI is related to past values of itself as well as that of IIP. While equation (3) present a similar behaviour of IIP towards KLCI. Based on equation (2) and (3) four different hypotheses between KLCI and IIP can be formulated. First unidirectional Granger-
causality runs from KLCI to IIP which shows that stock market growth increase the growth of an economy but not vice versa. Second unidirectional Granger-causality runs from IIP to KLCI but not vice versa. This shows that only economic growth increase the prediction of the stock market growth. The third is bidirectional or feedback causality which shows that the growth rate of an economy increases the prediction of stock market growth and vice versa. Finally there might be no Granger causality in any directions which shows the independence between stock market and economic growth.

This study will use the VECM approach to analyse the data. The use of VECM allows specifying the long-run dynamics of the model while also capturing potential endogeneity. The specification model to answer the research question of this study can be written in the equations 2-5 below:

\[ \Delta EG_t = \alpha_1 + j=1^n \gamma_1 \Delta EG_{t-j} + \epsilon_{1,t-1} \]  
(4)

\[ \Delta FD_t = \alpha_2 + j=1^n \gamma_2 \Delta EG_{t-j} + \epsilon_{2,t-1} \]  
(5)

\[ \epsilon_{1,t-1} = \lambda_1 (aEG_{t-1} + bFD_{t-1}) \]  
(6)

\[ \epsilon_{2,t-1} = \lambda_2 (aEG_{t-1} + bFD_{t-1}) \]  
(7)

where \( \Delta \) is the first difference operator, \( \Delta EG_t \) is the output, \( FD_t \) is the amount of financial development and \( \epsilon_{1,t-1} \) are uncorrelated error terms. The ECM allow alternative channel of causality through the error correction term which is overlook in standard Granger causality tests.

4. Empirical Results and analysis

Table 2 summarizes the outcome of the ADF, PP and NG-Perron tests on all the variables in this study. The null hypothesis tested is that the variable under investigation has a unit root against the alternative that it does not. In each case, the lag-length is chosen using the Akaike Information Criteria (AIC) for both the ADF and Ng-Perron test. The results of the unit root tests applied to the series reveal that for each variable the null hypothesis of a unit root are not stationary in both the ADF and the PP in their levels.

Table 2: Unit root test

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF</th>
<th>PP</th>
<th>NG-Perron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MZ_d</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MZ_d</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MSB_d</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MP_d</td>
</tr>
<tr>
<td>No trend</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IIP</td>
<td>-1.20</td>
<td>-1.14</td>
<td>1.10</td>
</tr>
<tr>
<td>KLCI</td>
<td>-1.48</td>
<td>-1.82</td>
<td>-0.36</td>
</tr>
<tr>
<td>First difference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IIP</td>
<td>-4.34</td>
<td>-</td>
<td>34.50</td>
</tr>
<tr>
<td>KLCI</td>
<td>-5.84</td>
<td>21.84</td>
<td>-5.54</td>
</tr>
<tr>
<td>Trend and intercept</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IIP</td>
<td>-2.26</td>
<td>-3.94</td>
<td>-14.99</td>
</tr>
<tr>
<td>KLCI</td>
<td>-2.09</td>
<td>-2.55</td>
<td>-31.66</td>
</tr>
</tbody>
</table>
These results are consistent when an intercept and trend are included as deterministic components in the test equation. The unit root test performed on the first differences of the variables indicates the stationarity of both KLCI and IIP. While performing NG-Perron test results shows stationarity of all variables except in levels without trend. Since the data appears to be stationary we, therefore, maintain the null hypothesis that each variable is integrated of order one $(I(1))$.

The test results, as reported in Table 5, show that a cointegrating vector exists between variables for both maximum eigenvalue ($\lambda$\text{Max-Eigen}) and the trace statistics($\lambda$\text{trace}). From the analysis we conclude that there is a cointegrating vector between economic growth and financial development. Since the series is cointegrated, the long run causality of the series can be determined by the Vector Error Correction Model (VECM).

Table 2: Johansen’s Cointegration Tests

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Trace Statistics</th>
<th>5% Critical Value</th>
<th>1% Critical Value</th>
<th>Max-Eigen Value Statistics</th>
<th>5% Critical Value</th>
<th>1% Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$r = 0$</td>
<td>13.29$^a$</td>
<td>18.17</td>
<td>23.46</td>
<td>7.60$^a$</td>
<td>16.87</td>
<td>21.47</td>
</tr>
<tr>
<td>$r \leq 1$</td>
<td>5.69$^a$</td>
<td>3.74</td>
<td>6.40</td>
<td>5.69$^a$</td>
<td>3.74</td>
<td>6.40</td>
</tr>
</tbody>
</table>

Note: $r$ is a number of cointegrating vectors. $a$, $b$ and $c$ denotes significance at the 1%, 5% and 10% levels, respectively. The deterministic components are selected using the Pantula principle suggested by Johansen (1992). The Pantula principle selected the cointegration equation with linear deterministic trend. Lag lengths in vector auto regression are selected using the likelihood ratio (LR) test.

Table 3: Granger Causality test

<table>
<thead>
<tr>
<th>IIP</th>
<th>KLCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIP</td>
<td>-3.25$^a$</td>
</tr>
<tr>
<td>KLCI</td>
<td>2.40$^a$</td>
</tr>
</tbody>
</table>

Note: $a$, $b$ and $c$ denotes significance at the 1%, 5% and 10% levels, respectively.

The Granger-causality tests conducted above are conducted using a joint F-statistic for the exclusion of variable from one equation as illustrated above in a simple matrix form. The results of these tests indicate that Granger-causality is running in both directions between stock market and economic growth. Table 3 clearly shows the Granger-causality directions between stock market and economic growth in Malaysia. Our results show that stock market does have a causal impact on economic growth or vice versa. This result falls under the third hypothesis where bidirectional or feedback causality which shows that the growth rate of an economy increases the prediction of stock market growth and vice versa. Results are also in line with findings by Padhan (2007) and Enisan and Olufisayo (2009) who obtained similar results on other countries.

Once the variables included in the VAR model found to be cointegrated, we applied VECM. Indeed VECM is special type of restricted VAR, is introduced to correct a disequilibrium that may shock the whole system. The ECM results reported in Table 4 clearly show the significant error correction for both stock market and economic growth. This shows that these variables adjust to the disequilibrium from the long run relationship. This result supports the two-way relationship between stock market
and economic growth in Malaysia. This result also consistent with previous findings by Demetriades and Hussein (1996), Padhan (2007) and Enisan and Olufisayo (2009) which noted the mutual dependency of financial development and economic growth. Thus it can be said in short run and long run, erudition and development of stock market helps to stimulate and influence the future growth performance. Besides, our findings also suggest that economic stimulus is vital to sustain the development of stock market in Malaysia.
Table 4: Error Correction Model (ECM) results for stock market and economic growth

<table>
<thead>
<tr>
<th>Variables</th>
<th>Constant</th>
<th>$EC_{t-1}(ECT)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>KLCI</td>
<td>0.12</td>
<td>0.02^a</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(2.47)</td>
</tr>
<tr>
<td>IIP</td>
<td>0.01</td>
<td>0.25^a</td>
</tr>
<tr>
<td></td>
<td>(0.99)</td>
<td>(-1.52)</td>
</tr>
</tbody>
</table>

Note: t-statistic in the parenthesis. a, b and c denotes significance at the 1%, 5% and 10% levels, respectively

5. Conclusions and policy implications

Malaysia presents a promising place for both local and foreign investors through an investment opportunity provided in the stock market. The key role played by the government to develop the economy, the efficient financial institution and the excellent economic climate are the reason of the strong pace of stock market development in Malaysia. Acknowledging the importance of stock market development in Malaysia we examine the prominent role of stock market in Malaysia economy.

Therefore this paper attempts to determine the nexus between stock market development and economic growth in Malaysia both in the short run and the long run. This analysis is helpful for us to understand the role of stock market development in the process of boosting economic growth. Likewise we also managed to observe the function of economic growth in stimulating stock market. In fact it is meaningful to perform an empirical investigation to observe the time related nature of the relationship between these two components of important macroeconomic variables to see the direction of movement. We employed ADF, PP and Ng Perron test to check the stationarity of the data and proceed with the Johansen cointegration test. Further we perform the Granger causality test and VECM to check the direction of causality in the short and the long run.

This study has shown there is ample empirical evidence that support the important role of stock market development to promote future growth. While supporting the argument of the importance of stock market development in the future economic growth, it is evident from the result that stock market development has significantly positive effect on the economic growth performance. Our empirical result test for both Granger causality and VECM test reported the existence of two way relationship which supports the hypothesis that the relationship runs from stock market towards economic growth and vice versa. This implies that short run and long run relationship does exist between stock market and economic growth. The existence of a long run relationship between these two variables could imply greater macroeconomic stability.

This result is consistent with the previous findings showing a significant relationship between stock market and economic growth. The key policy implications of our findings are straightforward. In order to maintain the strong growth of the economy the Malaysian government has to intensify the financial system and undertake strong action to enhance the capability of the financial sector as a key enabler and catalyst of economic growth. Added to this what we require therefore is a strong and transparent stock market which allows attracting the investors and furthering positively influences the future growth of an economy.

Results from this study will contribute to a deeper knowledge concerning the stock market-growth nexus in NIC such as Malaysia. Most importantly this research provides new dimensions on the discussion between stock market and economic growth in individual country where past research more focused on examining the relation through cross-country sample.

References


