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The Analysis of Risk Models for Malaysia’s Non-financial Sectors

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Abstract

The research highlights three Value-at-Risk (VaR) representations that are integrated with GARCH-based models to estimate the Malaysian stock exchange market risk. The methodology covers the quantifications of expected maximum losses at 95% level of confidence for six non-financial sectors namely the construction, consumer product, industrial product, plantation, property and trade and services from the year of 1993 until 2006. Further analyses are conducted using Kupiec, Christoffersen and Lopez backtests. The results in particular based on Lopez’s Quadratic Loss Function test proved that when the basic VaR is integrated with GARCH model under the assumption of t-distribution, the model is found to be at the most accurate level. Thus consideration on non-normal behaviour of the market is important to determine financial risk quantifications.

Keywords: Value-at-Risk, volatility modelling, backtesting

JEL classification: C53, G10

1 Introduction

In today’s competitive business environment, financial markets have to face varieties of risks namely market, credit, liquidity, operational and legal risk. Even though the volatile environment exposes firms to greater financial risk levels, the conditions always provide the platform for firms to find new and better ways to manage risk. From time to time, combinations between fundamental and analytical methodologies create new and better risk measures thus helping financial decision maker to finalize more accurate investment results in order to minimize losses. Some of the major risk measurement tools can be categorized according to the type of financial instruments (Wiener, 1997). Bonds, for instance, can be associated with duration, convexity and term structure models while stocks utilize volatility, correlation and beta. The largest financial market in the world that is the foreign exchange uses spreads, exchange rate volatilities and target zones to measure risk. Credit instruments may comprehend rating and default models. Many academicians and practitioners agree that the evolution of

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risk measures since the mid-1970s has experienced a tremendous change due to the introduction of many new derivative instruments and engineered securities (refer to among others Alexander, 1998; Butler, 1999; Dowd, 1999, 2005; Jorion, 1997; Rahl & Esseghaier, 2000, Sharpe, 2000).

Undoubtedly, one of the risk measures that are getting more attention is the Value-at-Risk (VaR). Practically, it summarizes the worst expected loss that an institution can suffer over a target horizon under normal market conditions at a given confidence level (Dowd, 2005; Jorion, 1997). Together with the encouragement by the Basle Committee, VaR has been widely applied especially on banks. VaR popularity is influenced with the urgent need for a single risk measure in order to establish the capital adequacy limits for banks and other financial institutions

Nonetheless, many researchers give evidence that some of the studies on VaR require more in-depth investigation. As far as the literature is concerned, studies on VaR are micro-focused on VaR comparative assessment using the variance-covariance method (VCV), historical simulation (HS), Monte Carlo simulation (MCS) and extreme value theory (EVT) methods. For MCS in particularly, most research are done to enhance the computation speed or to handle methodological issues for example the variance reduction elements, effect of total risk factors and MCS in multivariate settings (Fuglsbejerg, 2000; Glasserman, Heidelberger & Shahabuddin, 2000a, 2000b; Papageorgiou & Paskov, 1999; Singh, 1997). Still studies on integrating MCS with volatility models as an additional parameter to maximise its accuracy capabilities have yet to be extensively and thoroughly examined.

Within these consequences, the objective of this paper is to test three VaR models on major non-financial sectors in the Malaysian market and finally to suggest the most accurate one that can be applied in the market. The full valuation approach namely the MCS is employed for this reasons. The following sections are structured as follows: Section 2 highlights the review of literature. Section 3 describes the data and the methodology used to determine the VaR values. Section 4 explains the findings and Section 5 concludes.

2  Review of Literature

Several research papers have reported ample evidence that market data can be more accurately explained when it is quantified by heavy-tailed distributions. Thus for this purpose, a technique via Monte Carlo simulation can be applied to capture fat-tail issues in verifying VaR. Historically, Monte Carlo which is named after a famous roulette wheel, is used to estimate VaR from a distribution of future portfolio values which is simulated using pseudo-random number or, in other general term, the random walk approach (Dowd, 1998).
In basic terms, MCS will generate a series of underlying asset prices and then observe how the instrument behaves. To do this, it requires a distribution for changes in each market factor which include correlations between each factor. Typically, either one or both normal and lognormal distributions are utilized with correlations obtained from the historical financial data. MCS is strictly dependent on a statistical distribution assumption of market factors and its parameters (Linsmeier & Pearson, 1996). As mentioned by Davis and Fouda (1999):

*With the Monte Carlo simulation method, the user specifies a distribution for the changes in the market factors. Although the normal and lognormal distributions are commonly used for this purpose, the user is free to use any distribution that is believed to adequately represent the possible changes in market factors. The distribution is used to simulate changes in market factors. These are then used to calculate thousands of potential future portfolio values. These portfolio values are sorted in descending order and VaR is determined in the same manner as in the historical simulation method.*

(p. 186)

Among the method to quantify VaR, MCS is found to be the most powerful and yet the most intensive method because it can adapt to situations which other method is not able to. It accommodates nonlinearity conditions, fat-tails, extreme scenarios, volatility risk and model risk (refer among others Jorion, 2006; Lambardiaris, Papadopoulou, Skiadopoulos & Zoulis, 2003). Dowd (1998) and Jorion (2006) stressed that MCS is an ideal financial risk management tool for multidimensional scenarios where the outcomes depend on multiple risk variable.

Another research with significant impact on VaR literatures using MCS was conducted by Beder (1995). Based on three U.S. investment portfolios, Beder (1995) utilized both MCS and HS at two different holding periods specifically 1-day and two-weeks. The first portfolio which consisted of U.S. Treasury strips showed that the HS for the database of 100 and 250 days was highly appreciated compared to MCS. For the second portfolio based on the outright and option positions on S&P 500 equity index contract records for 1-day returns, both the HS and MCS showed low probability of high return/large loss expectation while for the two-week returns the distribution changes displayed upside down normal distribution (binomial behaviour). The result for portfolio three that is the combination of portfolio 1 and 2 displayed more consistency than single-asset class. In short, Beder provide evidence that different VaR calculations can produce drastically different results. It depends also on the correlation assumptions, the type of data and length of time horizons. Thus different capital requirements and allocation decisions can be achieved using a similar model that produces various VaR within the same investment’s portfolio. Nonetheless, this study provided contradicting views compared to Hendricks (1996) who failed to justify any suitable model. This can be due to the fact that Beder (1995) intended to quantify only the magnitude of errors rather than evaluating models’ performance,
Vlaar (2000) on the other hand combined and tested the methodology of variance-covariance and MCS to address the dynamics of Dutch interest rates and its effect on the VaR models' accuracy. Besides that, three other methods namely HS, pure MCS and pure variance-covariance were also applied to the same data. Under the ten-day holding period, the research on 25 simulated and hypothetical portfolios of Dutch government bonds demonstrated that the combined variance-covariance and MCS gave the best outcomes. However, these results are only held for term-structure model with a normal distribution and GARCH specification. Unlikely performances are shown by t-distribution or co-integration specification due to less weight of extreme distribution. These results supported earlier views like those by de Raaji and Raunig (1998) that statistical distribution plays an important part in determining VaR numbers.

Earlier, Johansson, Seiler and Tjarnberg (1999) who focused exclusively on VaR for equities on a daily basis over a 1-day horizon for 261 trading days, proposed that the application of MCS with full valuation could be considered to obtain a more reliable risk estimate than analytical models. Their study applied a higher number of models as compared to Vlaar (2000). In precise, twenty VaR models which consist of four analytical models, four HS models, six MCS models and six analytical beta techniques (commonly known as beta VaR, is similar to the technique used in RiskMetrics) were put together to test the effectiveness of the downside risk measures.

It is important to note that VaR behaviour using MCS can be strictly influenced by imposing different types of marginal distributions other than normal distribution. A different behaviour towards interpreting a range of skewness and kurtosis coefficient effect is one of the expected outcomes attainable from it. Besides that the results are also constrained by the chosen level of probability. Some examples of other non-normal marginal distributions include a mixture of the normal distribution with and without skewness and also a generalised lambda distribution (Delianedis, Laknado & Tikhonov, 2000).

3 Data and Methodology

3.1 Data

Six non-financial sectors time series data traded in the first board of the Bursa Malaysia over the period 1993 until 2006 is chosen for the analysis. The data which consists of daily return of the indices is then divided into two parts in that data consist from year 1993 until 2004, is used to estimate the volatility parameters while from year 2005 until 2006, is used for backtesting the estimated VaR models (Mohamed, 2005; Pederzoli, 2006). The selected sectors are construction, consumer product, industrial products, plantation, properties, trading and services. The remaining two sectors namely
technology and mining are not included because the former only started its index listing in the year of 2000, while the latter is represented by only one company. On the other hand, the financial sector which comprises of banking institutions, securities firms and unit trust companies are omitted because these institutions portray different regulatory background as compared with the non-financial ones (Ibrahim & Mazlan, 2006). These data were obtained from Datastream.

3.2 VaR Theoretical Formula

From Dowd (2005), Value-at-risk, \( \text{VaR}_t(h) \), can be defined as the conditional quantile as follows:

\[
\text{Pr} \left[ \rho_{t+h} < \text{VaR}_t(h) \right] = \alpha
\]

(3.1)

where return series \( r_{t+h} \) of a financial asset denotes the portfolio wealth at time \( t \), the portfolio return at time \( t + h \), degree of confidence level \( \alpha \) and holding period \( h \). VaR is a specific quantile of a portfolio’s potential loss distribution over a given holding period. Assuming \( r_t \) follows a general distribution, \( f_t \), VaR under a certain chosen \( h \) and \( \alpha \) gives:

\[
\int_{-\infty}^{\text{VaR}(h, \alpha)} f_{t+h}(x)dx = 1 - \alpha
\]

(3.2)

Infinitely, VaR can be presented as the followings:

\[
\text{VaR}_t = W_t \alpha \sigma \sqrt{\Delta t}
\]

(3.3)

where \( W_t \) is the portfolio value at time \( t \), \( \sigma \) is the standard deviation of the portfolio return and \( \sqrt{\Delta t} \) is the holding period horizon (\( h \)) as a fraction of a year.

3.3 Volatility Modelling

The Monte Carlo methodology consists of a number of specific steps (Jorion, 2006):

1. Select a model for the stochastic variable(s) of interest.
2. Estimate its parameters; volatilities, correlations, and etc. based on historical or market data.
3. Construct fictitious or simulated paths for the stochastic variables where ‘random’ numbers are produced.
4. Each set of ‘random’ numbers then produces a set of hypothetical terminal price(s) for the portfolio.
5. Repeat these simulations (steps 3 and 4) as many times as necessary to be confident that the simulated distribution of portfolio values is sufficiently close to the ‘true’ distribution of actual portfolio values.
6. VaR values are then inferred from this proxy distribution.
3.4 Volatility Modelling under a Normal Distribution

Under the normal (Gaussian) distribution, the study will implement the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) while under t-distribution, the study applies the GARCH (t-distribution) and the Exponential GARCH (EGARCH) model,

Volatility Modelling under a Normal Distribution

From Bollerslev (1986) generalized Engle’s ARCH \((p)\) model by adding the \(q\) autoregressive terms to the moving averages of squared unexpected returns:

\[
\sigma_t^2 = \omega + \alpha_1 \varepsilon_{t-1}^2 + \ldots + \alpha_p \varepsilon_{t-p}^2 + \beta_1 \sigma_{t-1}^2 + \ldots + \beta_q \sigma_{t-q}^2
\]

(3.4)

where \(\omega > 0\); \(\alpha_1, \ldots, \alpha_p\); \(\beta_1, \ldots, \beta_q\) \(\geq 0\)

The simplest model is GARCH \((1,1)\) if \(p = q = 1\), thus the estimator is:

\[
\sigma_t^2 = \omega + \alpha \varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2
\]

(3.5)

where \(\omega > 0\) and \(\alpha, \beta \geq 0\). Commonly, most researchers apply GARCH \((1,1)\) model due to the fact that it is relatively easier to estimate and more parsimony (Bollerslev, 1986).

Volatility Modelling under Non-Normal Distribution

a. GARCH t-distribution

From equation (3.4), the GARCH-t is then expressed for which \(\mu = v_t \sqrt{h_t}\) where \(v_t ~ t(0, 1, \nu)\) is a student t-distribution with a mean equal to zero, variance unity, \(\nu\) degrees of freedom and \(h_t\), a scaling factor that depends on the squared error term at time \(t-1\).

b. EGARCH

EGARCH is generated by taking the exponential function of conditional volatility. Through this volatility log formulation, the impact of the lagged squared residuals is exponential

\[
\ln \sigma_t^2 = \alpha + g(z_{t-1}) + \beta \ln \sigma_{t-1}^2
\]

where

\[
g(z_t) = \omega z_t + \lambda \left( |z_t| - \sqrt{\frac{2}{\pi}} \right)
\]

(3.6)
3.5 Test of Accuracy

Proportion of Failure Likelihood Ratio Test (Kupiec, 1995)

Based on the probability under the binomial distribution of observing \( x \) exceptions in the sample size \( T \).

\[
f(x) = \binom{T}{x} p^x (1-p)^{T-x}
\]

(3.7)

an accurate VaR model should provide VaR estimates with unconditional coverage \( \hat{p} \), given by the failure rate \( \frac{x}{T} \), equal to the desired coverage \( p \), given by the chosen confidence level (5% for 95% confidence levels). Therefore, under the null hypothesis \( H_0 = \hat{p} = p \), the appropriate likelihood ratio is given by:

\[
LR_{ac} = -2\ln(\binom{T}{x}) = 2h((1- \hat{p})^{T-x} \hat{p}^x) + 2h((1- p)^{T-x} p^x))
\]

(3.8)

Conditional Testing (Christoffersen, 1998)

Firstly, by extending the \( LR_{ac} \) to specify that exceptions must be independently distributed, the test needs to define the indicator of exceptions as follows:

\[
I_i = \begin{cases} 
1, & f_{\Delta P_{i,t}} < VaR_{i|t-1} \\
0, & f_{\Delta P_{i,t}} \geq VaR_{i|t-1}
\end{cases}
\]

(3.9)

Secondly, define the number of days in which state \( i \) is followed by state \( j \) as \( T_{ij} \), and the probability of observing an exception conditional on state \( i \) the previous day as \( \pi_i \). In order to test the hypothesis that the failure rate is independently distributed, the likelihood test for independence is calculated as:

\[
LR_{ind} = -2\ln\left(\frac{(1-\pi)^{r_{00}+r_{10}} \pi^{r_{01}+r_{11}}}{(1-\pi_0)^{r_{00} \pi_0 ^{r_{01} \pi_0} (1-\pi_1)^{r_{10} \pi_1} r_{11}}\right) \sim \chi_2^2
\]

(3.10)

where

\[
\pi = \frac{T_{01}+T_{11}}{T}, \quad \pi_0 = \frac{T_{01}}{T_{00} + T_{00}}, \quad \text{and} \quad \pi_1 = \frac{T_{11}}{T_{10} + T_{11}}
\]
Finally the likelihood test for conditional coverage $LR_{cc} = LR_{uc} + LR_{ind}$ which is quantified as:

$$LR_{cc} = -21\ln \left( \frac{(1 - P)T_1 P^T_0}{(1 - \pi_0)^T_0 \pi_0^T_0 (1 - \pi_1)^T_1 \pi_1^T_1} \right) \sim \chi^2_2$$

(3.11)

**Quadratic Loss Function (Lopez, 1999)**

Quadratic Loss Function (QLF) is indicated based on the concept of failure rate; if actual loss is greater than the VaR value then it is considered as failure. Every failure is assigned a constant 1, otherwise is zero.

$$L_{i,t+1} = \begin{cases} 1 + (\Delta r_{i,t+1} - \text{VaR}_{i,t})^2, & \text{if } \Delta r_{i,t+1} < \text{VaR}_{i,t} \\ 0, & \text{if } \Delta r_{i,t+1} \geq \text{VaR}_{i,t} \end{cases}$$

(3.12)

### 4 Results

#### 4.1 Descriptive Statistical Analysis

Table 1 presents the basic statistical characteristics of the return series. The sample mean for is close to zero. Except for COP and PLN, the calculated means are negative for all the sectors. This indicates CON, INP, PRP and TAS have more negative returns compared to COP and PLN which are positive-definite. The construction sector with the highest standard deviation value indicates that it has the largest average deviation from the mean compared to other returns series. For similar parameter, the consumer product has the lowest number. In addition, the normality tests outputs as indicated by the sample skewness, kurtosis and the consequent rejections of the normality hypothesis based on Jarque-Bera analysis confirm the empirical findings that daily returns for the data are far from being normal (Gaussian).

A low $-0.5700$ (INP) to a high of $0.9145$ (CON) for skewness values suggest that the series distributions are skewed. Besides that the distributions of series are leptokurtic or fat-tailed as shown by the high kurtosis as compared to the normal distribution which is 3. Strong evidence of non-normality is also given by the large JB statistics. The Ljung-Box Q tests reject the null hypothesis in all series with serial correlation of the squared returns. Referring to Table 4.1, ARCH effect is present in the data together with the large values of chi-square statistics and small values of probability statistics which indicates the hypothesis that the series is not heteroscedastic is rejected at the 1% significance level.
With these evidences of non-normal return distribution, it is then appropriate to apply volatility models in this study. The estimated values for three models namely the GARCH(1,1)N, GARCH(1,1)t and EGARCH(1,1)t will be compared in Subsection 4.2. Denote that subscript ‘N’ is referred to model under normal distribution while subscript ‘t’ is referred to model under t-distribution. Then the models are cointegrated with the VaR framework to construct risk models for each of the six non-financial sector.

4.2 GARCH-based Model Estimates

The GARCH-based models are estimated by maximum likelihood method and the results are presented in Table 2. Subsequently, Table 3 shows the findings of several diagnostic tests for each model.

a. GARCH (1,1)$_N$

Overall results of parameter $\omega$, $\alpha$ and $\beta$ are found to satisfy the condition; $\omega > 0$ and $\alpha, \beta > 0$ (Panel A, Table 2). The intercept term ‘$\omega$’ is extremely small while the coefficient on the lagged conditional variance, $\beta$ is approximately 0.9. The sum of the estimated coefficient for each sector of the variance equations (3.16) $\alpha$ and $\beta$, which is the persistence coefficient, is very close to unity. It signifies highly persistent shocks to the conditional variance. The coefficients on all three terms in the conditional variance equation are highly statistically significant except for COP. Referring to Table 4.3, the residual based diagnostic tests indicate that the squared standardized returns present no significant autocorrelation. This is found consistent with the LB which finally verifies GARCH(1,1)N is expected to capture the non-linear dependence. Conclusively, the estimated models are also well-specified as there is no residual ARCH evidence in the standardized returns.

b. GARCH (1,1)$_N$, 

Referring to Panel B, Table 2, the parameters for GARCH(1,1)t verify the restriction that $\omega > 0$ and $\alpha, \beta > 0$. For all series, the coefficients for the three terms in the conditional variance equation are found to be highly statistically significant. Besides providing intercept $\omega$ values that are very small, $\beta$ shows a high value between 0.8 and 0.9. The sum of coefficient $\alpha$ and $\beta$ for the sectors indicate values close to one, which portrays a high persistence level of volatility. From Table 3, the Ljung-Box statistics test indicates at lag 20, no evidence of non-linear dependence is seen in the standardized squared residuals. This proves the model is well-specified in that Engle’s first-order LM test for ARCH residuals show no evidence of time-varying volatility for the tested series.
The conditional variance equation coefficients including asymmetry coefficient \( \delta \), are significantly different from zero. This confirms the existence of asymmetric impacts of returns on conditional variance. For the diagnostic tests, the model has approximately zero mean and unit variance. Furthermore no autocorrelation is indicated as shown by the squared standardized residuals meaning all nonlinear dependencies are captured in all the returns. In all, the estimated model is well-specified since the ARCH effects are also not present for the sample.

**Table 1 Basic statistics of the full sample**

<table>
<thead>
<tr>
<th></th>
<th>CON</th>
<th>COP</th>
<th>INP</th>
<th>PLN</th>
<th>PRP</th>
<th>TAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>−0.0001</td>
<td>0.0001</td>
<td>−0.0002</td>
<td>0.0002</td>
<td>−0.0004</td>
<td>−3.99E-05</td>
</tr>
<tr>
<td>Std Dev</td>
<td>0.0207</td>
<td>0.0126</td>
<td>0.0154</td>
<td>0.0152</td>
<td>0.0187</td>
<td>0.0169</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.9145</td>
<td>0.2221</td>
<td>−0.5700</td>
<td>−0.2813</td>
<td>0.6349</td>
<td>0.8322</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>28.1857</td>
<td>40.3411</td>
<td>41.7549</td>
<td>26.8443</td>
<td>21.0114</td>
<td>32.9321</td>
</tr>
<tr>
<td>JB</td>
<td>91372.35</td>
<td>199828.20</td>
<td>215402.20</td>
<td>81513.64</td>
<td>46731.86</td>
<td>128776.00</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>LB(20)</td>
<td>2163.20</td>
<td>1356.00</td>
<td>1721.00</td>
<td>2123.6</td>
<td>1732.7</td>
<td>1370.10</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>ARCH-LM(1)</td>
<td>1296.31</td>
<td>593.58</td>
<td>1433.05</td>
<td>973.98</td>
<td>1412.95</td>
<td>564.01</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
</tbody>
</table>

Notes:
1. JB test statistics are based on Jarque-Bera (1987) and are asymptotically chi-square-distributed at 2 degrees of freedom.
2. LB(20) is the Ljung-Box test for serial correlation with 20 lags, applied to squared returns \( (r^2) \).
3. ARCH-LM(1) is the test for ARCH effects for 1 lag.
4. Values in parentheses denote the p-value. *** denotes significance at 1% level.
5. Industries (Symbols used): Construction (CON), Consumer Product (COP), Industrial Product (INP), Plantation (PLN), Property (PRP), Trade & Service (TAS)
Table 2 Estimation results of GARCH-based model

<table>
<thead>
<tr>
<th>Panel A: GARCH(1,1)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\omega$</td>
<td>$\alpha_1$</td>
<td>$\beta_1$</td>
<td>$\alpha + \beta$</td>
</tr>
<tr>
<td>CON</td>
<td>4.64E-06 (1.79E-06)**</td>
<td>0.0877 (0.0142)**</td>
<td>0.9014 (0.0146)**</td>
<td>0.9891</td>
</tr>
<tr>
<td>COP</td>
<td>6.19E-07 (1.17E-06)***</td>
<td>0.0721 (0.0223)**</td>
<td>0.9199 (0.0332)**</td>
<td>0.9843</td>
</tr>
<tr>
<td>INP</td>
<td>2.31E-06 (7.68E-06)***</td>
<td>0.1161 (0.0191)**</td>
<td>0.8639 (0.0153)**</td>
<td>0.9854</td>
</tr>
<tr>
<td>PLN</td>
<td>2.81E-06 (9.04E-07)***</td>
<td>0.1391 (0.0197)**</td>
<td>0.8451 (0.0195)**</td>
<td>0.9842</td>
</tr>
<tr>
<td>PRP</td>
<td>3.95E-06 (1.10E-06)***</td>
<td>0.1390 (0.0258)**</td>
<td>0.8394 (0.0204)**</td>
<td>0.9784</td>
</tr>
<tr>
<td>TAS</td>
<td>1.64E-06 (7.50E-07)**</td>
<td>0.0889 (0.0146)**</td>
<td>0.9100 (0.0149)**</td>
<td>0.9989</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: GARCH(1,1)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\Omega$</td>
<td>$\alpha_1$</td>
<td>$\beta_1$</td>
<td>$\alpha + \beta$</td>
</tr>
<tr>
<td>CON</td>
<td>8.55E-06 (1.90E-06)**</td>
<td>0.1497 (0.0245)**</td>
<td>0.8331 (0.0148)**</td>
<td>0.9828</td>
</tr>
<tr>
<td>COP</td>
<td>1.28E-06 (3.24E-07)***</td>
<td>0.1015 (0.0131)**</td>
<td>0.8761 (0.0099)**</td>
<td>0.9776</td>
</tr>
<tr>
<td>INP</td>
<td>2.77E-06 (6.78E-07)***</td>
<td>0.1201 (0.0177)**</td>
<td>0.8573 (0.0126)**</td>
<td>0.9774</td>
</tr>
<tr>
<td>PLN</td>
<td>3.67E-06 (8.51E-07)***</td>
<td>0.1571 (0.0261)**</td>
<td>0.8256 (0.0151)**</td>
<td>0.9827</td>
</tr>
<tr>
<td>PRP</td>
<td>4.02E-06 (5.95E-07)***</td>
<td>0.1576 (0.0115)**</td>
<td>0.8251 (0.0101)**</td>
<td>0.9827</td>
</tr>
<tr>
<td>TAS</td>
<td>3.33E-06 (8.15E-07)***</td>
<td>0.1218 (0.0152)**</td>
<td>0.8779 (0.0119)**</td>
<td>0.9997</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel C: EGARCH(1,1)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\Omega$</td>
<td>$\alpha_1$</td>
<td>$\beta_1$</td>
<td>$\delta$</td>
</tr>
<tr>
<td>CON</td>
<td>−0.4131 (0.0527)***</td>
<td>0.2799 (0.0289)***</td>
<td>0.9710 (0.0056)***</td>
<td>−0.0794 (0.0157)***</td>
</tr>
<tr>
<td>COP</td>
<td>−0.2485 (0.0352)***</td>
<td>0.1876 (0.0192)***</td>
<td>0.9783 (0.0034)***</td>
<td>−0.0376 (0.0104)***</td>
</tr>
<tr>
<td>INP</td>
<td>−0.3296 (0.0450)***</td>
<td>0.2322 (0.0239)***</td>
<td>0.9799 (0.0043)***</td>
<td>−0.1025 (0.0337)***</td>
</tr>
<tr>
<td>PLN</td>
<td>−0.4001 (0.0500)***</td>
<td>0.3035 (0.0287)***</td>
<td>0.9694 (0.0049)***</td>
<td>−0.0450 (0.0148)***</td>
</tr>
<tr>
<td>PRP</td>
<td>−0.4395 (0.0492)***</td>
<td>0.3391 (0.0291)***</td>
<td>0.9714 (0.0054)***</td>
<td>−0.0332 (0.0148)***</td>
</tr>
<tr>
<td>TAS</td>
<td>−0.2599 (0.0298)***</td>
<td>0.1892 (0.0210)***</td>
<td>0.9845 (0.0035)***</td>
<td>−0.0419 (0.0115)***</td>
</tr>
</tbody>
</table>

Notes:
1. GARCH(1,1)$_N$ is the GARCH model under normal distribution; GARCH(1,1)$_t$ is the GARCH model under $t$-distribution and EGARCH(1,1)$_t$ is the EGARCH model under $t$-distribution.
2. Standard errors are in parentheses.
3. *, ** and *** denote significance at 10%, 5% and 1% levels.
4. $\omega$ is the constant in the conditional variance equations. $\alpha$ refers to the lagged squared error. $\beta$ coefficient refers to the lagged conditional variance and $\delta$ coefficient is the EGARCH asymmetric term.
### Table 3 GARCH-based models diagnostic tests

<table>
<thead>
<tr>
<th></th>
<th>E(μ/σ)</th>
<th>E(μ/σ)^2</th>
<th>LB(20)</th>
<th>ARCH(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CON</td>
<td>GARCH(1,1)_N</td>
<td>-0.0423</td>
<td>0.9983</td>
<td>21.8000 (0.3410)</td>
</tr>
<tr>
<td></td>
<td>GARCH(1,1)_t</td>
<td>-0.0053</td>
<td>0.9562</td>
<td>21.4750 (0.3680)</td>
</tr>
<tr>
<td></td>
<td>EGARCH(1,1)_t</td>
<td>0.0283</td>
<td>0.9639</td>
<td>16.0430 (0.7130)</td>
</tr>
<tr>
<td>COP</td>
<td>GARCH(1,1)_N</td>
<td>-0.0268</td>
<td>1.0005</td>
<td>21.1120 (0.3900)</td>
</tr>
<tr>
<td></td>
<td>GARCH(1,1)_t</td>
<td>-0.0159</td>
<td>0.9887</td>
<td>13.5510 (0.8420)</td>
</tr>
<tr>
<td></td>
<td>EGARCH(1,1)_t</td>
<td>0.0010</td>
<td>0.9981</td>
<td>9.8627 (0.9500)</td>
</tr>
<tr>
<td>INP</td>
<td>GARCH(1,1)_N</td>
<td>-0.0481</td>
<td>0.9982</td>
<td>10.5050 (0.9560)</td>
</tr>
<tr>
<td></td>
<td>GARCH(1,1)_t</td>
<td>-0.0179</td>
<td>0.9700</td>
<td>10.1030 (0.9650)</td>
</tr>
<tr>
<td></td>
<td>EGARCH(1,1)_t</td>
<td>0.0131</td>
<td>0.9703</td>
<td>13.6430 (0.8340)</td>
</tr>
<tr>
<td>PLN</td>
<td>GARCH(1,1)_N</td>
<td>-0.0226</td>
<td>1.0002</td>
<td>25.3860 (0.1850)</td>
</tr>
<tr>
<td></td>
<td>GARCH(1,1)_t</td>
<td>-0.0145</td>
<td>0.9434</td>
<td>23.8530 (0.2480)</td>
</tr>
<tr>
<td></td>
<td>EGARCH(1,1)_t</td>
<td>0.0010</td>
<td>0.9398</td>
<td>24.0100 (0.2410)</td>
</tr>
<tr>
<td>PRP</td>
<td>GARCH(1,1)_N</td>
<td>-0.0154</td>
<td>1.0002</td>
<td>18.4770 (0.5550)</td>
</tr>
<tr>
<td></td>
<td>GARCH(1,1)_t</td>
<td>-0.0112</td>
<td>1.0549</td>
<td>15.6060 (0.7400)</td>
</tr>
<tr>
<td></td>
<td>EGARCH(1,1)_t</td>
<td>0.0388</td>
<td>0.9610</td>
<td>21.8970 (0.3450)</td>
</tr>
<tr>
<td>TAS</td>
<td>GARCH(1,1)_N</td>
<td>-0.0319</td>
<td>1.0004</td>
<td>15.1460 (0.7690)</td>
</tr>
<tr>
<td></td>
<td>GARCH(1,1)_t</td>
<td>-0.0113</td>
<td>0.9698</td>
<td>12.8240 (0.8840)</td>
</tr>
<tr>
<td></td>
<td>EGARCH(1,1)_t</td>
<td>0.0184</td>
<td>0.9794</td>
<td>13.0820 (0.8730)</td>
</tr>
</tbody>
</table>

**Notes:**
1. Standard errors are in parentheses.
2. LB(20) is the Ljung-Box statistics at lag 20, distributed as a chi-square with 20 degrees of freedom. The critical values for LB tests at lag 20 are 37.56, 31.41 and 28.41 at 1%, 5% and 10% levels of significance respectively.

### 4.3 Testing for Accuracy

To determine whether the suggested VaR model is accurate, tests are conducted based on Kupiec, Christoffersen and Lopez test. The results are shown in subsequent Table 4 while visual illustrations are presented via Figures 1, 2 and 3.
Table 4 Accuracy test performance summary

<table>
<thead>
<tr>
<th></th>
<th>LRuc</th>
<th>Lrin</th>
<th>LRcc</th>
<th>AQLF</th>
</tr>
</thead>
<tbody>
<tr>
<td>CON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$MC_1^+GARCH_N$</td>
<td>0.1719</td>
<td>2.8652</td>
<td>3.0372</td>
<td>0.1746</td>
</tr>
<tr>
<td>$MC_1^+GARCH_I$</td>
<td>0.0108</td>
<td>1.4207</td>
<td>1.7431</td>
<td>0.0777</td>
</tr>
<tr>
<td>$MC_1^+EGARCH_I$</td>
<td>0.0016</td>
<td>1.8156</td>
<td>1.6172</td>
<td>0.1019</td>
</tr>
<tr>
<td>COP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$MC_1^+GARCH_N$</td>
<td>0.5470</td>
<td>4.1999</td>
<td>4.7469</td>
<td>0.2473</td>
</tr>
<tr>
<td>$MC_1^+GARCH_I$</td>
<td>0.1456</td>
<td>3.0627</td>
<td>3.2083</td>
<td>0.1677</td>
</tr>
<tr>
<td>$MC_1^+EGARCH_I$</td>
<td>0.1211</td>
<td>2.9572</td>
<td>3.0783</td>
<td>0.1607</td>
</tr>
<tr>
<td>INP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$MC_1^+GARCH_N$</td>
<td>1.1812</td>
<td>0.8578</td>
<td>2.0390</td>
<td>0.0431</td>
</tr>
<tr>
<td>$MC_1^+GARCH_I$</td>
<td>0.8278</td>
<td>0.3686</td>
<td>1.1964</td>
<td>0.0223</td>
</tr>
<tr>
<td>$MC_1^+EGARCH_I$</td>
<td>6.8934</td>
<td>5.8698</td>
<td>12.7632</td>
<td>0.3788</td>
</tr>
<tr>
<td>PLN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$MC_1^+GARCH_N$</td>
<td>7.9534</td>
<td>6.3792</td>
<td>14.2326</td>
<td>0.4411</td>
</tr>
<tr>
<td>$MC_1^+GARCH_I$</td>
<td>6.5989</td>
<td>5.4559</td>
<td>12.0548</td>
<td>0.3615</td>
</tr>
<tr>
<td>$MC_1^+EGARCH_I$</td>
<td>6.7167</td>
<td>5.5378</td>
<td>12.2545</td>
<td>0.3684</td>
</tr>
<tr>
<td>PRP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$MC_1^+GARCH_N$</td>
<td>0.7690</td>
<td>0.2577</td>
<td>1.0267</td>
<td>0.0188</td>
</tr>
<tr>
<td>$MC_1^+GARCH_I$</td>
<td>0.7101</td>
<td>0.1714</td>
<td>0.8815</td>
<td>0.0153</td>
</tr>
<tr>
<td>$MC_1^+EGARCH_I$</td>
<td>0.7100</td>
<td>0.1714</td>
<td>0.8814</td>
<td>0.0154</td>
</tr>
<tr>
<td>TAS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$MC_1^+GARCH_N$</td>
<td>2.5357</td>
<td>2.3535</td>
<td>4.8892</td>
<td>0.1227</td>
</tr>
<tr>
<td>$MC_1^+GARCH_I$</td>
<td>1.5345</td>
<td>1.2929</td>
<td>2.8274</td>
<td>0.0638</td>
</tr>
<tr>
<td>$MC_1^+EGARCH_I$</td>
<td>1.8879</td>
<td>1.6897</td>
<td>3.5776</td>
<td>0.0846</td>
</tr>
</tbody>
</table>

Notes:
1. LRuc (Kupiec Test) and Lrin follow asymptotically $\chi(1)$ with critical value 3.84. LRcc (Christoffersen Test) is asymptotically $\chi^2$ distributed with critical value 5.99.
2. MC1 denotes Monte Carlo Cases

a. Failure Likelihood Ratio Test (Kupiec Test)

Referring to Column 2, Table 4 all VaR models for CON, COP, PRP and TAS pass LRuc test at 95% confidence level. Figure 1 illustrates the outcomes. Thus, the null hypothesis $H_0 = \hat{p} = p$ where the unconditional coverage, $\hat{p}$ equals the desired coverage level, $p$ is not rejected and it also illustrates that these models generate reasonable unconditional coverage probabilities. However for the other two sectors, observing INP, only $MC_1^+EGARCH_I$ fails to pass the LRuc test and for PLN, none of its model passes the Kupiec test. Thus the suggested models are not suitable to be
implemented for the plantation sector. In comparing between normal and t-distribution models, the former provides better accuracy outcome.

b. **Conditional Testing (Christoffesen Test)**

Referring to Column 4, Table 4, again all VaR models for CON, COP, PRP and TAS sector pass the LR$_{cc}$ test. Similar evidences are also shown for both INP and PLN sectors. One of the reasons for these is because the reasonable conditional coverage values for LR$_{cc}$ are found to be on the high side in that it exceeds the critical value of 5.99 (Figure 2).

c. **Quadratic Loss Function (Lopez Test)**

Observing Column 5, Table 4, model with the lowest values is represented by the MC$_1$+GARCH$_t$. This clearly indicates that when VaR is integrated with GARCH-based model under t-distribution assumption, it provides the highest accuracy level. Similar conclusion cannot be made for sector COP. However, in all sectors except for, the most inaccurate model is MC$_1$+GARCH$_N$, which means that when VaR is integrated with GARCH-based model under normal distribution, it does not provide the avenues for making the best risk quantification decisions.

![Figure 1 Kupiec test](image-url)
Figure 2 Christoffersen test

Figure 3 Lopez test
5. Conclusions

Overall when analysing the performance of VaR risk models for the Malaysian non-financial sectors, it is important when one should take into consideration the statistical properties of distribution. Assuming a normal distribution trait is easy but it may also has limited capabilities to tolerate fat tails or asymmetries.

As a general conclusion drawn from the accuracy tests, the most accurate model that can be associated with the Malaysian stock market is the VAR MC1+GARCHt. This is due to the fact that it quantifies for leptokurtic distribution or t-distribution thus illustrates a greater tendency to handle tail dynamics of the conditional distribution. It is important to note that accuracy of a model will gradually reduce if it relies only on the first two moments of loss distribution. Similar justifications can be referred to earlier studies by de Raaji and Raunig (1998), Lee and Saltoglu (2002), Lin and Shen (2006), Mohamed (2005) and Vlaar (2000). And even though EGARCH theoretically may handle asymmetry properties, this research found that VaR model is less accurate within the framework. This can be the result of assuming EGARCH will work with a t-distribution may not maximize its potential in VaR estimation. Thus to handle more extreme cases, for future research EGARCH should be associated with other forms of statistical distribution for example the Generalized Error Distribution (GED), Frechet, Weibull or even Gumbel distribution. Apart from that, other model from the GARCH-family may also be an interesting methodology to deal with VaR. In fact, the overall findings and concluding notes are also limited to the six sectors. Dealing with the remaining two non-financial sectors namely technology and mining plus the financial sector may quantified for different perspectives of discussions.

In summary, consideration on non-normal behaviour of the market is important to determine financial risk quantifications. In fact to establish the best model, VaR should be supported with backtesting techniques besides high dependencies on the settings of its data and methodology.
References


The Feasibility of Entrepreneurship after Retirement

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Abstract

Many people are looking forward for retirement after long years of working. Retirement is the time to do things that we enjoyed all this while. Nonetheless, some of the retirees are thinking about their retirement plans as their Employees Provident Fund (EPF) is not sufficient to support them for the remaining years and they are too shy to ask money from their children. In order to support themselves and with the motivation as well as the means, some of the retirees opt to be an entrepreneur. This paper attempts to explore entrepreneurship in later phase of life especially for most of the retirees which are categorised in the “Third Age” group. Additionally, this paper discusses the impact of elderly entrepreneurship towards entrepreneurship development in Malaysia.

Keywords: retirement, entrepreneurship, elderly, self-employment, motivation

JEL classification: L26, M13

1 Introduction

Population of ageing people has been increasing almost everywhere in the world. Since mid-twentieth centuries, the magnitude of older persons has been increasing gradually. Older person by United Nations’ Department of Economic & Social Affairs (2013) definition is people aged 60 years old and above. The number of older persons is 841 million in 2013, which is four times higher than the 202 million in 1950 and projected will almost triple by 2050, when it is expected to surpass the two billion mark (United Nations, Department of Economic & Social Affairs, 2013). In Malaysia, the percentage of people age 65 and above is 3.9 % in 2000 increase to 5.1 % in 2010 (Department of Statistics, 2011) and expected to increase by 6.8% in 2020 and 11.4% in 2040 (Department of Statistics, 2012). This magnitude will continue to increase as long as Malaysian experiencing improved health, longer life expectancy of male and female — 75 years old and 79 years old respectively, low mortality, and declining fertility due to urbanisation and higher number of working women.

In Malaysia, the low age of mandatory retirement for civil servants age is 56 but recently employees can take the options to choose to retire at the age of 58 as being revised by the government in July 2008 (Malaysia Government, 2008). Thereby,
these make Malaysian a retiree before they get older. However, it is different for the private sector as recently the government has been revising the minimum retirement age for private sector to 60 years old under the Minimum Retirement Act 2012 which take effect in July 2013 (Malaysia Government, 2012). This phenomenon plus the increasing ageing population can create social and economic challenges since they have 15 to 20 years more of their life after retirement based on the life expectancy rate. The rising demand for medical services and high medical expenses will impose pressures on government and family budgets, labour markets will experience shortages in the supply of labour plus implications on labour productivity and also will lead to the appearance of social welfare and gender related issues. These changes could affect economic growth and thereby the welfare of the people (Economic & Social Commission for Asia and the Pacific, 2004).

Therefore, there is a need to find ways to minimise these social and economic problems of the ageing people in Malaysia. One of the most possible solutions is to encourage entrepreneurship among the retirees. This is in line with the Ministry of Entrepreneurial Development vision on the establishment of Bumiputera Commercial and Industrial Community (BCIC) to assist in achieving Vision 2020. Involving retirees or elderly people in the labour force as entrepreneurs might help to minimise these problems and also have a positive impact on the country economic growth as well as entrepreneurship development in Malaysia.

However, entrepreneurship is typically perceived and described as a privilege and opportunity for younger people and whether the older population can be as entrepreneurial is in question. Thus, the purpose of this paper is to explore the opportunities of entrepreneurship in later phase of life especially on retirees, who are considered as ageing people. Additionally, this paper also discusses the impact of elderly entrepreneurship towards the development of entrepreneurship in Malaysia. This paper is an exploratory study and conceptual in nature, therefore it is expected that this paper could provide a valuable contributions to the policy makers and practitioners as well as contribute to the academician for further studies. This paper proceeds by analysing current literature on retirement, entrepreneurship and entrepreneurial motivation and intention. The following section discussing the feasibility of retired people taken entrepreneurship as a later phase career and lastly this paper point out some recommendations for the policy makers, companies as well as what steps retired people can take to venture into business. The last section concludes the paper.
2 Literature Review

2.1 Retirement

Traditionally, retirement is most often define as a workers move from full-time employment to complete withdrawal from the labour force in a single step (Purcell, 2001). Standard retirement age in developing countries often is lower than in the more industrialised world, most commonly at age 60 for men and age 55 for women. The reasons for such regional differences are due to the average life expectancy, which is usually lower in developing countries, and due to the involvement of a large numbers of young persons in need of jobs (United Nations, Department of Economic & Social Affairs, 2013).

In East Asian countries, the government provide pensions for government workers and only a few countries like Japan, Singapore, Malaysia and Taiwan provide a significant support to non-governmental workers (Chan, Biddlecom, Ofstedal & Hermelin, 2003; Holzmann, MacArthur & Sin, 2000). In Malaysia, the retirement age for civil servants of 58 years old means those retirees will have to rely on one-third of their actual income for a long period of time. Moreover, the actual number of older persons with pension only makes up a small percentage of the ageing population. On the other hand, the Employees Provident Fund (EPF) is the compulsory retirement scheme for private sector workers in Malaysia with 6.5 million contributors in 2013 (Lembaga Simpanan Wang Pekerja, 2014).

Nevertheless, a survey conducted by Dr. Tengku Aizan from Gerontology Institute, UPM in Malaysia reveals that 67% retirees’ main source of income come from their children (Hariati, 2007a). Data from the nationwide study on Mental Health and Quality of Life of Older Malaysians (2005) also shows that monetary assistance from sons and daughters are the most common source of income for older persons in Malaysia since most of the elderly are unable to work or find gainful employment, they have to depend on their children or grandchildren (Hariati, 2007b). In Indonesia, family financial contributions increase with age and generally higher for older men who has poor health and who is not working (McKee, 2006).

According to Purcell (2001), nowadays many workers choose to continue working after they retired from their lifetime job. Retirement is no longer the end of working but more to a career and lifestyle transition. Apoue yand Clark (2007) discover that retirement is associated with failing health. If people do not get active and just sit at home do nothing, their health will deteriorate faster especially older people which decrease their brain function and inclined to get Alzheimer. Another reason why people choose to work is because they want to reduce 50% of family support and make their own income by working rather than staying out of work (McKee, 2006).
2.2 Self-employment

Self-employment can be considered as the gainful employment that is not determined by wages or salary. Self-employed are own-account workers and employers (Karoly, 2004). In recent years, self-employment has been regarded as an important source of new jobs and a way of employing entrepreneurial abilities. Pietrobelli, Rabelolotti and Aquilina (2004) claim that in developing countries, self-employment is regarded as a dynamic modernising factor represents potential emerging entrepreneurs and also has positive effects on the development of the government and country. According to AARP study in 2004, about 10.2% of the overall workforce in US is self-employed and from that, 16.4% are workers aged 50 and older. Many of them made a transition from being a wage and salary worker to own-account workers after the age 50 (2004). In Malaysia, the self-employed workers amounted to 20.5% of the total distribution of employed workers (Hariati, 2007a). Self-employed people are financially better off than waged and salaried workers but they do not have pensions and health insurance on their current job.

According to a research done by Zissimopolous & Karoly (2007), the impact of health condition and access to capital are associated with the changes of waged and salaried workers to self-employment at an older age. A long life expectancy also motivates self-employed people to work longer (Devaney & Kim, 2003). Karoly (2004) reveals that older self-employed workers aged 51 and older, are more likely to be able to work longer even despite poorer health and work with more flexibility in hours. Thus, self-employed workers are more able to accommodate their changing preferences for work versus leisure as they make transition to retirement. The differences in the age distribution, health status and work effort among elder self-employed workers versus waged and salaried workers suggest that self-employed at older ages seems to be motivated to continue to work.

2.3 Entrepreneurship in Malaysia

Rogoff (2007) defines entrepreneurship is the creation of wealth through participation in any part of establishing, operating and investing in business ventures. People become entrepreneurs either they have to or because they are unable to find employment due to limited opportunities, or they want to because of their interests and dreams they want to pursue. Research has shown there are many reasons people attracted to entrepreneurship (Morrison, 2000; Pietrobelli, Rabelolotti & Aquilina, 2004). They want to follow their dreams, managing family and time constraints, having flexibility over time, building equity value, being the boss and doing good things especially for economic and social purposes (Rogoff, 2007).
In Malaysia, the development of entrepreneurship is a growing importance. (Arif & Syarisa (2003) state, the essence of entrepreneurship is in the creation and growth of new firms, whether out of necessity or opportunity. According to the 2012 statistics provided by the National SME Development Council, Small and Medium Enterprises (SMEs) represents the largest percentage of establishments in Malaysia at 97.3% and contributes 37.2% to Malaysia gross domestic products (GDP) and 57.4% to total work force (2013). The importance of entrepreneurship as one of the engines of growth for Malaysia’s economy can be seen through the vast amount and variety of supporting mechanisms and policies that exist for entrepreneurs. This includes the establishment of Ministry of Entrepreneurship Development (MeCD) in 2004 and a variety of funding schemes, tax incentives, physical infrastructure for business and entrepreneur as well as business incubators and advisory services.

In the Small and Medium Enterprises Ministerial Meeting in Chiang Mai, Thailand (Asia-Pacific Economic Cooperation, 2003), Malaysia reported the government has been and continue to support entrepreneurship by newly formulated and implemented economic policies and strategies that will be directed towards sustaining and promoting domestic sources of growth. Therefore, the growth of more entrepreneurs and enterprises are encouraged by formulating new micro credit programmes with the existing programmes were streamlined. Loans are easily accessible for enterprises through leaner loan conditions in terms of collateral, lower cost of borrowing and flexible repayment schedules.

Apart from that, another move taken by Malaysia to strengthening the developing entrepreneurial environment, the Ministry of Higher Education also implemented a new compulsory module for entrepreneurship course in all universities in 2007. Since entrepreneurship is associated with economic growth and development, it is a need to restructure the universities module to better educate students in the field of small business and entrepreneurship so the students can be independent, creative and competitive and can create job opportunities for people alike.

2.4 Entrepreneurial Motivations and Intentions

Motivation is the process by which an individual exert their efforts towards attaining a goal (Robbins & Coulter, 2007). In entrepreneurial contexts, motivation is the willingness that drives an individual to pursue a new venture creation. Webster and Walker (2005) describe many people jump into the entrepreneurship wagon either due to “push” factors or “pull” factors. “Pull” factors are positive factors that stimulate individual having a reasonably strong desire to start a business venture, whereby “push” factors are negative impulses that drive individual towards new venture
creation. On a general level, Bosma, Acs, Autio, Codura and Levie (2008) explain the “pull” and “push” motivations are associated with opportunity and necessity entrepreneurship used in.

The work of Segal, Borgia, & Schoenfeld (2005) and Shane, Locke and Collins (2003) claim the internal “pull’ factors such as need for achievement, locus of control, desire for independence, passion and drive rather than external “push” factors such as power, sense of obligation, status and affiliation that have ultimate bearing on the individual final decision to take entrepreneurial intentions The intention of being an entrepreneur not only drives by the human factor but also people’s life situations, changing goals or contingent preferences (Vesalainen & Pihlaka, 1999).

Thus, motivation is the driver for entrepreneurial intention. Intention is a state of mind directing a person’s attention toward a specific goal in order to achieve something. Krueger, Reilly and Carsrud (2000) state the entrepreneurial process of identifying opportunities is clearly an intentional process. A variety of intention models have been developed in previous research and most entrepreneurial research had used the Theory of Planned Behavior (TPB) by Ajzen (1991) and Shapero’s model of Entrepreneurial Event (SEE) by Shapero (1982) to see the intensity of people being an entrepreneur (De Pillis& Reardon, 2007; Krueger Jr., Reilly, & Carsrud, 2000; Ramayah & Harun, 2005; Segal, Borgia & Schoenfeld, 2005; Zhao, Seibert & Hills, 2005).

TPB explains three factors, which are crucial in changing the intention and the actual behaviour of a person. First of all, the belief and attitude somebody has toward the behaviour. Secondly, is a social factor termed subjective norm which refers to the social pressure from the environment on the individual to perform or not to perform the behaviour and lastly, factor that influences intention is the perceived behavioural control that the actual behaviour does not only dependent on the motivation or intention to perform certain behaviour, but also on the perception of the difficulty of performing the behaviour. Normally the more favourable the attitude and subjective norm and the greater the perceived control, the person intention to perform certain behaviour will be stronger (Ajzen, 1991).

On the other hand, SEE intentions to start a business that lead to entrepreneurial event are derived from a person’s perceptions of desirability and feasibility of action coupled with an individual propensity to take action. The perceived desirability comes from an attraction to start a business and the capability of starting a business is the perceived feasibility. It is influenced positively by the extent and breadth of a person past experience. This will result to a higher propensity to take action by the quality to act on one’s decision (Shapero, 1982).
Likewise, research done by Segal, Borgia and Schoenfeld (2005) argue that entrepreneurial intention is form when there is a positive anticipated outcome from entrepreneurship, high tolerance of risk and high desirability and self-confidence. Barbosa, Gerhardt and Kickul (2007) also claim that individual with high risk preference have a higher level of entrepreneurial intention and opportunity seeking self-efficacy. In addition, the subjective norms point the importance of family, friends, and relatives in encouraging entrepreneurship (Ramayah & Harun, 2005). Hence, intentions are the best predictors of entrepreneurship, though it is difficult to fully understand the reasons behind an entrepreneurial intention.

2.5 Retired Workers and Entrepreneurship

Not all people eager to stop working. They might well be glad that they do not have to work for someone else and get away from their routine works but yet, they still have so much to accomplish and their energies can still be put into good used particularly if there is any form of work that contributed to an increase in income and improvement of personal wealth (Gray, 2007). Therefore, entrepreneurship is a viable option for those who want to continue working post-retirement.

Life course perspective by Moschis (2007) integrates the variables and relationship that are relevant to shape the patterns of behaviour in later life. The events or changes that happened in people life through the process of socialization, changes in emotions and behaviours can lead to another event or changes in person life. This can be used to predict the changes that happened to a person in later phase of their life. Furlong (2004) discovers a growing number of Americans decided to go into business for themselves rather than working for someone else due to the technology advancement and expanding global market place. Many also moved to start their own business due to personal experience, sense of ownership and unexpected freedom as entrepreneurs.

Previous researches have suggested that older entrepreneurs are more capable of starting and running a business than younger entrepreneurs due to financial, human and social capital accumulated over a lifetime career (Singh & DeNoble, 2003; Weber & Schaper, 2004). Zhang (2007) discloses that elderly entrepreneurship is positively associated with regional economic growth. It helps to reduce the ageing labour shortages and the collapse of Social Security fund. He also mentioned older individuals have a higher self-employment rate and tend to concentrate in the knowledge-based sector than the younger individual.
2.5.1 Retired Workers and Entrepreneurial Motivation and Intentions

According to Klein (2007) starting up a business after retirement relates more on the person lifestyle and personality type. Personality traits such as need for achievement, locus of control and self-efficacy are variables that significantly related to entrepreneurial intention (Indarti & Kristiansen, 2003; Ramayah & Harun, 2005). According to Reid cited by Sharma (2008), retirees work after their retirement because they need the money and some of them worked because of the enjoyment of it. This is attributable to the longer live expectancy rate and better healthcare, recognised the need for extra income, and looking for intellectual stimulation.

Singh and DeNoble (2003) propose three types of early retirees entrepreneurs; constrained, rational and reluctant. Their study discovered constraint entrepreneurs will venture into business due to entrepreneurial tendencies and lack of liquidity constraints. The rational entrepreneurs will venture into business because they have greater financial resources, have business and social networks, have access to lower cost of capital and have relevant subsidies, whereby reluctant entrepreneurs jump into self-employment because they are lacking of financial securities and limited employment opportunities. The research also found that early retirees more reasonably become self-employed due to access of capital and more established networks; therefore they have more self-efficacy and entrepreneurial attitudes. It is agreeable with Kautonen (2008) research on Finland entrepreneurs found that elderly were driven to self-employment largely due to “pull” factors (i.e. earn more money and carry out own ideas) rather than “push” factors (i.e. unemployment and want a less stressful job). Elderly are more motivated to work by means of economics incentives when there are in their 50s and basically the motivation change when they are in the 60s where they feel they still have something to contribute and they do not want to waste their skills and years of experience (Finn, 2008).

Attitudes to retirement are changing and society is beginning to view that elderly seek self-fulfilment and meaning in their life and self-employment can offer opportunities for self-identity and achievement (Gray, 2007). Hence, entrepreneurship will give more reward such as valuable sense of fulfilment as well as grow the economy to elderly who are “pulled” towards it compared to being “pushed” into it (AARP Press Center, 2004).

3 Discussion

Upon careful examination from the literature, elderly people have much to contribute to the society. Considering the lower fertility rate and the rapidly ageing population in the future, it is important to target the effective use of older person’s capability so that
they can fulfil the role as part of as much as possible, in addition to supporting efforts to materialize their continuing work according to their motivation and capabilities. Since Malaysian retired at the age of 58, they have about 20 years more of their life to spend. It is a waste to let go of the experience and valuable resources. At their retirement age, they might want to continue working due to their passion for working, but various factors discourage them to continue staying in their current employment. Thus, one good way to solve these problems is the need to build a stronger elderly entrepreneurship environment especially among retirees.

Firstly, it is critical for the government with the help of organizations to maintain retirees or elderly people in the labour force since they have valuable human capital such as accumulated working experience, mature interpersonal skills and a well-established business network that is essential to encourage entrepreneurship and to support the success of their business. The retirees have been working for more than 30 years. Many of them are managers or executives that throughout their career they had gained so much experience and developed a lot of skills and some of them are entrepreneurial skills. Moreover, retirees are likely already build up a network of people from professional workers to regular people an essential elements in building up and doing businesses that younger counterpart are lacking.

Secondly, the retirees have strong financial condition. They have pensions from their long years of civil servant employment or their EPF. Even some of them have been planning for their retirement by saving money through investing in stocks, bonds and mutual funds. Given that businesses usually require capital and a good credit to obtain financing from other resources, retirees have financial capabilities that younger people are lacking off. On the other hand, for some retirees, their main source of income is the contribution from their children or extended family as they do not saved enough for their retirement. Hence, self-employment is an attractive option.

Thirdly, the health issue arises among the retirees and elderly. At the retirement age of 58, Malaysian people are older before their age. Old age is certainly prone to biological and physical decline. Older Malaysians are noted for practising an unhealthy lifestyle when it comes to exercising (Sharifah Norazizan & Tengku Aizan, 2007). If they just sit at home leisurely and doing nothing, they are prone to diseases. Inactivity poses a risk to several major chronic diseases such as Alzheimer, high blood pressure and heart diseases. Even with advance health care facilities it would not be a help to prolong the life expectancy. As a result, retirees need to occupy themselves with something, so that their body will be fit and their mind will be more alert and minimize the proneness to chronic diseases.
Fourth, Malaysian government is truly supportive in building up entrepreneurship environment. A lot of opportunities for aspiring entrepreneurs are growing. As of the vast amount of supporting mechanism and changing policies, there are plenty of opportunities in terms of access capital and business opportunities are there to grasp. In addition, the importance of information communication technology (ICT) also contributes to make entrepreneurial activities more accessible.

Lastly, the transition of retired people towards entrepreneurship has a strong impact on the development of entrepreneurship environment particularly in Malaysia. Malaysia is striving to build up Bumiputera Commercial and Industrial Community (BCIC) to assist in achieving Vision 2020, priority also have to be given to developing elderly entrepreneurship because elderly entrepreneurship has a stronger impact on regional economic growth than physical capital, knowledge capital, and younger entrepreneurship (Zhang, 2007). Government cannot just rely on younger generation but the government need to shift focus into retired people who can contributed to the development of entrepreneurial environment.

4 Recommendations

This section outlines a set of recommendations on how best to encourage entrepreneurship among the retirees and seize the opportunities especially for policy makers in Malaysia. The recommendations are based on previous discussion emphasizing on evidence-based research. It is clear that more multidisciplinary research is needed to understand the effects of the elderly entrepreneurship on the development of entrepreneurial environment.

Firstly, government put a lot of effort focusing on younger generations by establishing entrepreneurship programme in university to encourage students to choose entrepreneurship as their career. Even the unemployment rate of 3.0% (Department of Statistics, 2014) in Malaysia is considered low; government is pushing young Malaysian to venture into entrepreneurship. Nevertheless, government attention to entrepreneurship should not just focus on the young. The retirees should be included as the new focus and priority for entrepreneurship initiatives. The younger generations are very eager to work but they do not have the passion and abilities to be an entrepreneur and grasp all the opportunity out there. Therefore, government should look for ways to promote entrepreneurship to the retired people or people near retirement as a part of their retirement planning. Government agencies could design low cost or even free entrepreneurship training and forum programs to the elderly. Those who are senior and skilled in entrepreneurship, the programs can make them as examples and for those who have ideas but do not have enough knowledge, skills, or access to starting a business, necessary trainings on writing business plans, learning financial
management, familiarizing with business starting procedures, and referring to the correct network would be very helpful. They may be a bit slower in learning compared to younger generations but government can design some strategy and learning techniques that suit the elderly people. The policy can be changed into creating awareness of entrepreneurship activities for retired people. Having enterprise incubators or apprenticeship programme can also help entrepreneurs who are approaching retirement age to retain with their entrepreneurial activities and target their markets to include retired seniors who have the skills and interest to start businesses. Apart from that, existing retired people or elderly who are currently entrepreneurs can give seminars or talks on starting up new ventures since they will be more influential to encourage entrepreneurs and other seniors to be involved in more entrepreneurial activities and can also help the younger entrepreneurs to succeed.

Secondly, the scenario in Malaysia now, more company are willing to employ older workers because they are more experienced, show leadership skills, tend to be more positive in dealing with difficulties and have more motivation than the younger ones (Ram & De Silva, 2008). Besides employing them to work, current employer can help the retired people planning for their retirement and stimulate their employee who is in near retirement to be an entrepreneur. Employers or companies should encourage corporate entrepreneurship and make it as a part of organizational culture. Corporate entrepreneurship is the entrepreneurial behaviour within the organization (Morris, Kuratko, & Covin, 2008). If corporate entrepreneurship is the culture of the organization, this behaviour will be embedded in employees and they will have the intention to venture in a new business when they retired.

Thirdly, the retired people have to equip themselves with a lot of information about starting up a business and what business opportunities that they can grasp and get to know the suitable business for them. They can do research by attending seminars, talks, joining business associations, mingle around with experienced people in business or even visit businesses. Most importantly, retired people have to have the passion to start up business. They have time constraints in setting up businesses compared to younger people. Therefore, without passions it is near impossible to venture into business.

Additionally, franchise business is a growing opportunity for entrepreneurs. There are more than thousands businesses local and international that have franchisees. In Malaysia, Perbadanan Nasional Berhad (PNS) is an agency that focuses on franchising. Franchising is appealing to people who wants a less risky business with an existing well-known brand name, a good concept and operating plan. Known with a greater level of wealth and access to capital retired people have, they should take into consideration this form of business and franchise business is a good match for retired people.
5 Conclusions

Entrepreneurship can be considered as the engine of growth in many countries. Government should not abandon the fit and healthy retirees since they have much to contribute to the society and country. Retired people have the means, motives and opportunity to participate in and benefit from entrepreneurship. Apart from that, they can also contribute to the development of entrepreneurship in Malaysia.

There should be a new kind of support service that helps retired people to be economically active. Since most people will still be active for 20 years or so after retirement they will face a period half as long again as they have worked. It will be nice if they have some alternatives than simply leisure activities. Employers and government should look forward for a new and innovative ways of using these huge resources of wisdom and experience than the young and energetic resources. Developing elderly entrepreneurship should be treated as a national strategy for the economy in the long run.

Finally, entrepreneurship in later phase of life or after retirement should be a focal point since it is not too late for retired people and ageing individual to venture into it. It should be regard as one of the important research topic for further studies and practice particularly in gerontology and economic development area. In fact, future research should focus on the topic of elderly entrepreneurship to promote them publicly.

References


Unemployment and Inflation in Malaysia:
Evidence from Error Correction Model

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Abstract

The negative association between unemployment and inflation is known as the Phillips Curve because the trade-off relationship between these two variables was first pointed out by William Phillips in 1958. For several decades, the Phillips Curve has been an important tool for macroeconomic policy formulators in various countries. Considering the fact that the majority of the studies on the Phillips Curve have been done in the context of the developed economies, this study focuses on Malaysia and aims to empirically analyze the relationship between unemployment rate and inflation rate in a developing country. The main finding of the current inquiry is that there existed an equilibrium relationship between unemployment rate and inflation rate in Malaysia. In other words, the results of this study support the validity of the Phillips Curve hypothesis.

Keywords: unemployment, inflation, Malaysia

JEL classification: E52, E24, J3

1 Introduction

In 1958, William Phillips published his seminal paper entitled “The Relationship between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom 1861 – 1957”. According to Phillips, there existed a strong negative association between unemployment and inflation in the country during the observation period. This trade-off relationship discovered by Phillips is now known as the “Phillips Curve”.

Despite some criticisms of the basic tenets of the Phillips Curve, the hypothesis remains one of the most important foundations for macroeconomics. Since 1958 till the present time, numerous academic inquiries have been done on the relationship between unemployment and inflation in various countries. As Hart (2003, p.108) observed, “The Phillips curve still plays a prominent role in macroeconomic theory and associated empirical work”.

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The basic theoretical foundations of the Phillips Curve can be understood by using the concept of labour demand and supply. If labour demand is greater than labour supply, the excessive demand for labour can put upward pressure on the wage rate, which will cause high inflation in the country. In this situation, it would be easy for workers to find employment and the unemployment rate would remain at a low level. By contrast, if labor supply exceeds labour demand, the surplus of labour supply would push the wages down, which would result in a lower inflation rate in the country. At the same time, with the excessive labour supply, it would be difficult for workers to find job, and unemployment would be at a high level.

In other words, during the years of economic boom, companies would try to increase their production volumes by employing more workers. During these economic upturns, low unemployment would co-exist with high inflation. On the other hand, during economic recessions, companies would try to decrease their production volumes by decreasing the number of workforce. In such a situation, high unemployment would be accompanied by low inflation.

Besides providing a solid theoretical foundation the Phillips Curve hypothesis has important policy implications. Price stabilization is one of the important policy targets of central bank in any country, and it can be achieved through controlling inflation rate. Central bank tends to formulate and conduct the monetary policy with the aim to keep inflation as low as it is possible. However, assuming that there exists an inverse relationship between inflation and unemployment, achieving a low inflation rate would be possible when or if the unemployment rate is high. This means that central bank will face a serious dilemma of whether to choose a combination of low inflation and high unemployment or vice versa.

The problem of high unemployment is one of the most onerous domestic economic and political issues in any country. High unemployment may prompt political leaders to oppose central bank’s initiatives aimed at price stabilization if these initiatives exacerbate unemployment. In other words, central bank and political leaders may have different opinions about the proposed price stabilization policies, which could prevent the policy makers from introducing decisive economic measures.

Considering important implications of the Phillips Curve hypothesis the current study aims to examine whether there existed the trade-off relationship between unemployment and inflation in Malaysia and employs several econometric techniques for this purpose. This article consists of five sections. Following this introduction, Section 2 gives a brief review of literature on the Phillips Curve hypothesis. Section 3 offers information on the unemployment rate and the inflation rate in Malaysia over the period 1975–2004. Research method and data used in this study are explained in Section 4, and the empirical results are reported in Section 5. Section 6 concludes.
2    Literature review

For several decades, the Phillips Curve remains an important criterion and a guiding principle for macroeconomic policy formulators. As Islam et al. (2003, p.107) noted, “In the 1960s and 1970s, the Phillips Curve was used as an important macroeconomic policy tool in the developed as well as less developed countries. It acted as a reminder for the macroeconomic policy formulators and the governments how far they were able to push down inflation rate or unemployment rate without unduly risking the other because of the trade-off relationship between these two key macroeconomic variables”.

There exists a vast body of literature on the Phillips Curve. Research studies on the topic began appearing as early as in the 1960s. Samuelson and Solow (1960) examined the relationship between unemployment and inflation in the context of the United States economy and concluded that there had existed an inverse relationship between these two macroeconomic variables. A significant contribution to the research on the Phillips Curve was made by Solow (1970) and Gordon (1971) who confirmed the existence of a negative trade-off relationship between unemployment and inflation in the United States using macroeconomic data for both the pre-1970s and the post-1970s periods. The studies by Solow and Gordon have been known as the “Solow-Gordon affirmation” of the Phillips Curve.

Despite a solid theoretical foundation and the availability of numerous empirical studies that have confirmed the validity of the Phillips Curve, there exist criticisms and doubts regarding the soundness of the hypothesis. As Islam et al. (2003, p. 107) remarked, “Since its inception, the Phillips Curve hypothesis has been open to debates”. For example, such prominent economists as Friedman (1968) and Phelps (1967) refuted the existence of the trade-off relationship between unemployment and inflation. They both conceded that a negative relationship between unemployment and inflation could be in evidence but only in the short run. In the long run, unemployment rate would conform to a vertical pattern and the trade-off relationship between the two variables would cease to exist. A more recent study by Cashell (2004) supported this argumentation. The researcher maintained that in the long run, unemployment tends to move towards an equilibrium level, which is dubbed as the natural rate of unemployment or the “non-accelerating inflation rate of unemployment” (NAIRU).

Robert Lucas (1976), a prominent economist and a representative of the Chicago economic school, argued that the trade-off relationship between unemployment and inflation may exist only if the workers do not expect that the policy makers could create an artificial situation of high inflation combined with low unemployment. Otherwise, if the workers can foresee an impending high inflation they would demand a wage increase. In such a case, high unemployment and high inflation would co-exist, which
contradicts the Phillips Curve hypothesis. This line of argumentation is known as the “Lucas critique” of the Phillips Curve.

The thorough and systematic criticism of the Phillips Curve done by Lucas led to a loss of interest in the topic among the academicians. As Debelle and Vickery (1998, p. 384) put it, “The Phillips Curve fell into a period of neglect in academic circles during the 1980s, while remaining an important tool for policy makers”. However, in the 1990s, there occurred a revival of interest in the Phillips Curve hypothesis, and it once again became “the subject of intensive debate (for example, the symposium in the Journal of Economic Perspectives)” (Debelle & Vickery, 1998, p. 384).

To reflect this renewed interest, King and Watson’s (1994) study examined the existence of the Phillips Curve in the context of the U.S. economy using the post-war macroeconomic data. The findings of the study provided empirical support to the existence of the trade-off relationship between unemployment and inflation in the United States. As King and Watson (1994) pointed out, the presence of the inverse relationship between unemployment and inflation could be detected if the long-run and the short-run noises are eliminated from the data. A study by Hogan (1998) tested the Phillips Curve hypothesis using the U.S. macroeconomic data over the period 1960 – 1993. The findings of the study supported the existence of a significant and negative relationship between unemployment and inflation although the traditional Phillips Curve seemed to over-predict the rate of inflation.

Recent methodological innovations allow a more thorough examination of the Phillips Curve hypothesis. For example, in some research studies, panel data analysis has been used to test the existence of the “common” Phillips Curve in different countries over the same period of time. One of such studies done by DiNardo and Moore (1999) employed the panel data analysis, the method of Ordinary Least Squares (OLS) and the Generalised Least Squares (GLS) to investigate the Phillips Curve in the context of the developed economies and selected 9 OECD (Organization for Economic Co-operation and Development) member countries. The findings of the study confirmed the existence of the “common” Phillips Curve in all these countries. As DiNardo and Moore (1999, p. 19) concluded, “In sum, we believe that our results show a remarkable robust relationship between relative inflation and relative unemployment”.

Another study that employed the panel data analysis to examine the Phillips Curve hypothesis was done by Turner and Seghezza (1999). It focused on 21 OECD member countries over the period from the early 1970s to 1997. To analyze the pooled data, the researchers used the method of Seemingly Unrelated Estimation (SURE) rather than the OLS. Based on the findings, Turner and Seghezza concluded that there was a “strong support” for the existence of the “common” Phillips Curve among the 21 OECD member countries.
Academic inquiries on the Phillips Curve hypothesis in the context of the Malaysian economy are still lacking. An empirical research on the relationship between inflation and unemployment in Malaysia was done by Furuoka (2007) who examined the unemployment gap, which is the difference between the natural rate of unemployment and the actual rate of unemployment. The study detected the presence of a long-run equilibrium and a causal relationship between inflation and unemployment in the country.

Considering the important political and economic implications and the fact that the majority of the previous academic inquiries on the Phillips Curve have been done in the context of the developed economies, the present paper chooses Malaysia as a case study to analyse the relationship between unemployment and inflation.

3 Unemployment Rate and Inflation Rate in Malaysia

Unemployment rate in Malaysia was above 5 per cent in the 1970s (see Figure 1). In the beginning of the following decade, i.e., in 1981 and 1982, it fell below the 5 per cent level. From 1983, the unemployment rate kept increasing until it reached its peak of 8.7 per cent in 1987. Starting from 1988, the reverse trend was in evidence. Due to the economic boom in the country the unemployment rate was shrinking and, in 1997, it amounted to 2.6 per cent. From 1998 to 2004, the unemployment rate in Malaysia remained at a moderate level of approximately 3.5 per cent.

As to the inflation rate, there have been greater fluctuations between 1975 and 2004 compared to the unemployment rate in the country over the same period (see Figure 1). In the second half of the 1970s, the inflation rate was approximately...
4 per cent. In 1980, it reached 6.6 per cent, and further increased to 9.7 per cent in 1981. Beginning from 1982, the inflation rate kept decreasing until it amounted to less than 1 per cent in 1986. In the first half of the 1990s, the inflation in the country remained stable at approximately 4 per cent. The Asian economic crisis that started in 1997 triggered the inflation rate in Malaysia which reached 5.2 per cent in 1998. Between 2000 and 2004, there was some stabilization in the inflation rate fluctuations and the inflation rate remained at approximately 1.5 per cent. It should be noted that between 1975 and 2004, both the inflation rate and the unemployment rate in Malaysia were relatively low. Thus, the average annual inflation rate was 3.37 per cent, while the average unemployment was 4.76 per cent.

4 Data and Methods

This study uses the Error Correction Model (ECM) analysis to test the Phillips Curve hypothesis and to examine the relationship between unemployment rates and inflation rates in Malaysia for the period of 1975 – 2004. The annual data for unemployment rate and inflation rates for these countries are obtained from National Economic and Development Authority (NEDA), Philippines (2009), the Department of Statistics (DOS), Malaysia (2006) and the Asian Development Bank (ADB) (2007).

Three separate econometric tests will be conducted, i.e., (1) unit root test, (2) Johansen cointegration test, and (3) Error Correction Model. In order to test the simple Phillips Curve, the following equation can be used:

$$ IFR_t = \alpha_0 + \gamma_1 UER_{t-1} + \epsilon_t $$

(1)

where $\alpha_0$ is a constant, $\gamma_1$ is the slope coefficient, $IFR_t$ is inflation rate in Malaysia in the year $t$, $UER_t$ is unemployment rate in Malaysia in the year $t$, and $\epsilon_t$ is the error term. Support for the Phillips Curve hypothesis would require a negative and significant coefficient for the unemployment rate, i.e. $\gamma_1 < 0$.

The current paper estimates the “augmented Phillips Curve” rather than the simple Phillips Curve. Therefore, the equation could be expressed as:

$$ \Delta IFR_t = \alpha_0 + \sum_{i=1}^{n} \beta_i \Delta IFR_{t-i} + \sum_{i=1}^{n} \gamma_i \Delta UER_{t-i} + \epsilon_t $$

(2)

There are three stages in which the Phillips Curve is tested in this paper. In the first stage, a unit root test is used to examine the stationarity of the data sets. According to Gujarati (2003), the time series data is stationary if its mean and variance are constant over time. The current study uses the augmented Dickey-Fuller (ADF) unit root test
to examine the stationarity (Dickey & Fuller, 1979, 1981). The ADF test is based on the following regression:

$$\Delta y_t = \mu + \beta_t \cdot t + \sum_{i=1}^{n} \gamma_i \Delta y_{t-i} + \epsilon_t$$ (3)

where $t$ is the linear time trend, $\mu$ is a constant, $\Delta$ is the difference operator, and $\epsilon_t$ is the error term. The ADF test tends to be sensitive to the choice of lag length $n$ which is determined by minimizing the Schwarz information criterion (SIC) (Schwarz, 1978).

In the second stage, this study examines the implications of equation (1). For this purpose, the OLS regression model could be used provided that the variables are integrated of order zero, $I(0)$. On the other hand, if the variables are integrated order one, $I(1)$, Johansen cointegration test (Johansen, 1988, 1991) could be used to check the cointegrating relationship between the variables. The variables are considered cointegrated if there is a long-run equilibrium relationship between them (Gujarati, 2003). The Johansen co-integration test is based on a maximum likelihood estimation of the K-dimensional Vector Autoregressive (VAR) model of order $p$,

$$Z_t = \mu + A_1 \Delta Z_{t-1} + A_2 \Delta Z_{t-1} + \ldots + A_{k+1} \Delta Z_{t-p+1} + \epsilon_t$$ (4)

where $Z_t$ is a vector of stochastic variables, $\mu$ is a vector of constants, $A_i$ is matrices of parameters, and $\epsilon_t$ is a vector of the error terms. The model could be transformed into an error correction form:

$$\Delta Z_t = \mu + \Gamma_1 \Delta Z_{t-1} + \Gamma_2 \Delta Z_{t-2} + \ldots + \Gamma_{k+1} \Delta Z_{t-p+1} + \pi Z_{t-1} + \epsilon_t$$ (5)

where $\pi$ and $\Gamma_1 \ldots \Gamma_{k+1}$ are the matrices of the parameters. On the other hand, if the coefficient matrix $\pi$ has reduced rank $r < k$, then the matrix can be decomposed into $\pi = \alpha \beta'$. The Johansen cointegration test involves testing for rank of the $\pi$ matrix by examining whether the eigenvalue of $\pi$ is significantly different from zero. There could be three conditions: (1) $r = k$, which means that $Z_t$ is stationary at levels, (2) $r=0$, which means that $Z_t$ is the first differenced Vector Autoregressive, (3) $0<r<k$, which means that there exist $r$ linear combinations of $Z_t$ that are stationary or cointegrated.

The current study uses the Trace ($Tr$) eigenvalue statistic (Johansen, 1988; Johansen & Juselius, 1990). The likelihood ratio statistic for the trace test is:

$$Tr = -T \sum_{r=1}^{p-2} \ln(1 - \lambda_i)$$ (6)
where $\lambda_{r+1}, \ldots, \lambda_p$ are the smallest eigenvalues of the estimated $p - r$. The null hypothesis for the Johansen test is that there are at most $r$ cointegrating vectors. Johansen cointegration test is also sensitive to the choice of lag length $n$ which is determined by minimizing the Akaike information criterion (AIC) (Akaike, 1974).

In the third stage, this study runs the following Error Correction Model (ECM):

$$
\Delta IFR_t = \beta_1 + \sum_{i=0}^n \beta_2 \Delta UER_{t-1} + \sum_{i=1}^n \beta_3 \Delta IFR_{t-1} + \beta_4 ECT_{t-1} + \epsilon_t \tag{7}
$$

where $ECT_{t-1}$ is the lagged value of the error correction term. There are two advantages to using this model. Firstly, the Wald test for the joint significance of the lagged independent variables can be used to examine the short-run impact of a change in the independent variables on the dependent variable. Secondly, the $t$-test for the significance of the error correction term can be used to examine the long-run impact.

5 Findings

The current study on the Phillips curve in Malaysia uses data for the period from 1973 to 2004. For the purpose of the analysis, all the data are transformed into a logarithm form.

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<td>$UER_t$</td>
</tr>
</tbody>
</table>

Note: Figures in parentheses indicate number of lag structures

** indicates significance at the 1% level

* indicates significance at the 5% level

As the first step, the ADF root test was used to examine the stationarity of the variables. The results from the ADF test are shown in Table 1. Despite some minor differences in the findings, the obtained results indicate that the two variables – $IFR$ and $UER$ -- are integrated of order one, $I(1)$.

In the second stage, Johansen co-integration test was used to examine the long-run movement of the variables. As Engle and Granger (1987) pointed out, only variables with the same order of integration can be tested for co-integration. In the present study, the both variables – $IFR$ and $UER$ – could be examined for co-integration. The results of the co-integration test are reported in Table 2.
Table 2 Johansen co-integration test

<table>
<thead>
<tr>
<th>Eigenvalue</th>
<th>Trace statistic</th>
<th>5 per cent critical value</th>
<th>Probability</th>
<th>Number of co-integrating equations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.338</td>
<td>13.718</td>
<td>12.32</td>
<td>0.029</td>
<td>None*</td>
</tr>
<tr>
<td>0.043</td>
<td>1.333</td>
<td>4.12</td>
<td>0.290</td>
<td>At most 1</td>
</tr>
</tbody>
</table>

Notes: the result corresponds to VAR's with one lag
** indicates significance at the 5% level

It should be noted that Johansen cointegration test can be biased when the number of observations is small. The maximum lag length for the test was set at two due to a limited number of observations (32). According to the Akaike information criterion (AIC), optimal lag length could be one (1). Therefore, the empirical results of the Johansen test and the ECM are based on the lag length of one.

The findings of the present study indicate that there existed a long-run relationship between the inflation rate and the unemployment rate (i.e., IFR and UER), which means that these variables are co-integrated. In other words, although the variables are not stationary at levels, in the long run, they closely move with each other.

Finally, the Error Correction Model (ECM) was employed to examine the short-run impact of the independent variables on the dependent variable as well as the long-run impact. The empirical results of the Wald statistic and t-statistic are reported in Table 3.

Table 3 Error Correction Model (Dependent variable: ΔIFR)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Degree of freedom</th>
<th>Wald statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔUER</td>
<td>2</td>
<td>6.007*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECT_{t-1}</td>
<td>−0.427</td>
</tr>
</tbody>
</table>

Notes: the result corresponds to VAR's with one lag
** indicates significance at the 1% level
* indicates significance at the 5% level

As seen in Table 3, the error correction term (ECT_{t-1}) was statistically significant and the adjustment coefficient was −0.427. This means that the inflation rate was adjusting towards an equilibrium level at the rate of 43 per cent. On the other hand, the results of the Wald test indicate the short-run impact of the independent variable (UER) on the dependent variable (IFR). This means that the unemployment rate did seem to have a significant impact on the inflation rate in the short run.

In a nutshell, the empirical findings of the present study imply that there existed an equilibrium relationship between the inflation rate and the unemployment rate in Malaysia. Thus, this study provides evidence to support the existence of the Phillips curve in the context of the Malaysian economy.
6 Conclusion

The negative association between unemployment and inflation pointed out by Phillips (1958) has been an important foundation for macroeconomic management and the guiding principle for formulation of economic policies in various countries. The current study conducted an empirical analysis of the relationship between unemployment and inflation in Malaysia over the period 1973 – 2004, and it used three different methods for this purpose.

As the results of the unit root tests done in this study show, both the inflation rate and the unemployment rate in Malaysia could be considered as integrated of order one. Therefore, Johansen cointegration test was used to examine the long-run relationship between the variables. The findings of the Error Correction Model indicated the presence of the short-run impact of the unemployment rate on the inflation rate as well as the existence of the long-run impact.

The current inquiry lends support to the existence of the Phillips Curve in the context of a developing economy, such as Malaysia. This outcome encourages a closer look at various socio-economic factors that may influence the unemployment rate and the inflation rate in the country. For example, future studies may want to incorporate other variables, such as output gaps, to examine the workings of the Phillips Curve in Malaysia.

References


Strategic Management Accounting: *State-of-the-Art*

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Abstract

The current paper presents the *state-of-the-art* of strategic management accounting (SMA) information usage among organisations. Despite SMA claimed importance to organisations operating in today’s competitive environment, little is known about its current achievement. In Malaysia in particular, the subject is almost absent. Thus, motivated by the scant attention given to SMA, the current paper attempts to present the current development of the subject. Specifically, inherited by the disparate concepts put forth by its various advocates, the current paper presents a review of its development and result of a pilot research carried out on manufacturing companies operating in Malaysia. It is interesting to note that despite the doubts cast by some advocates, organisations used strategic management accounting information to greater extent. The current finding enriches the limited knowledge on organisations’ extent of SMA usage which explicitly rejecting doubts about the subject’s rhetorical states, and reveal the potential of SMA to further progress. However, inherited by the exploratory nature of the current findings generalisation is to be cautioned. More robust future study is suggested.

**Keywords:** strategic management accounting, competitive market, competitor information analysis, customer information analysis, product-related information analysis

1 Introduction

Well into the eighties, the efficacy of management accounting information has been questioned particularly on its ability to fulfil contemporary companies’ information requirements (Johnson & Kaplan, 1987). Some had called it as crisis in management accounting (e.g. Bromwich & Bhimani, 1989). It is claimed that its traditional information had failed to provide the information requirement for organisations’ strategic purpose (Bromwich & Bhimani, 1989; Johnson & Kaplan, 1987; Roslender & Hart, 2003). The argument was on its ability to fulfil the information requirement that could contribute to organisations’ competitiveness, and long-term performance (Hiromoto, 1988; Johnson & Kaplan, 1987; Kaplan, 1984). As a result, strategic management accounting emerged in the literature in about the same time claimed as a new development that could remedy the shortcoming of the traditional management accounting information (Simmonds, 1981).
However, it is rather daunting that the development of SMA has not received much publicity by fellow academia even until recently. Review of literature reveals that only a handful of published work could be found, and mostly were conceptual in nature. As a consequence, limited is known about its achievement. Some had even cast doubts on its practicality and assumed it as another figment of academic imagination (e.g. Lord, 1996). Nevertheless, previous researches had evidenced that SMA has made progress though it varies among organisations (e.g. Cravens & Guilding, 2001; Cadez, 2006; Guilding, 1999; Guilding et al., 2000). In contrast, Langfield-Smith (2008) considers that SMA is lacking in success. Notwithstanding, the current paper argues that SMA has made a tremendous progress that academia failed to recognised. Perhaps, the problem could be attributed to the emphasis made by the previous researchers that had been narrowed to searching for specific techniques that they claimed as SMA’s proxy.

Thus, motivated by the potential of SMA to serve organisations’ information requirement and the limited attention given by academia, the current paper presents its conceptualisation about how SMA information could be captured through a detailed review on the current progress of SMA. In addition, the progress of SMA information usage in Malaysia is also presented based on the result of a pilot study carried out on manufacturing companies.

The paper will be organised as follows. Inherited by the paucity of SMA in the literature, a detailed review on the subject will be presented in the first following section. The origin and the need for SMA is then discussed in the following section. Subsequently, result of a pilot study portraying a general scenario on SMA information usage amongst manufacturing companies is also presented. Finally, the paper ends with a section on discussion and conclusion which highlighted the implication to theory and practice, and suggestion for future research.

2 Literature Review

2.1 Strategic Management Accounting (SMA)

The term SMA has emerged in the accounting literature in the early eighties parallel with the development of strategic thinking in business (Simmonds, 1981). It is the move towards changing cost and management accounting systems to capture and provide information that are pertinent to organisation’s sustainable competitive advantage (Spicer, 1990). However, its development is considered by many as ‘slow’ and ‘ill defined’, and consequently ‘what constitute SMA’ is left tentative (Carr & Tomkins, 1996; Coad, 1996; Langfield-Smith, 2008; Lord, 1996). This is rather daunting despite being first made apparent for more then two decades now, coupled with the criticisms
and calls for a serious thought on the role of traditional management accounting in providing information for organisations operating in today’s furious competitive business environment (Bromwich, 1990; Bromwich & Bhimani, 1989; Guilding et al., 2000; Johnson & Kaplan, 1987; Roslender & Hart, 2003; Simmonds, 1981).

To date, the SMA development has been ‘conceptually descriptive’ while only a dearth of empirical evidences is available. Nonetheless, a handful of notable attempts have shed some lights on the broad ‘elements’ of management accounting information that deemed to be of strategic essentials, and consequently paved some directions of how the subject could be further developed (e.g. Cadez, 2006; Cadez & Guilding, 2008; Coads, 1996; Cravens & Guilding, 2001; Guilding, 1999; Guilding et al., 2000; Palmer, 1992; Roslender, 1995; Tillman & Goddard, 2008). These studies found that organisations have used some elements of SMA information (within their definition) for decades for various purposes that academics fail to recognise (Collier & Gregory, 1995; Hiromoto, 1988; Simmonds, 1981). For example, information about competitors which is one of SMA information elements were found to be widely used by companies as a mean to manage their market competition (pricing competition, cost management) and strategy implementation (Collier & Gregory, 1995; Cravens & Guilding, 2001; Guilding, 1999; Guilding et al., 2000; Palmer, 1992). In addition, Tillman and Goddard (2008) found that company uses strategic management accounting information to understand its strategic situations.

The next section presents some important developments in management accounting that leads to the need for SMA information. Specifically, it attempts to answer the question of ‘why?’, ‘what?’, and ‘how?’ with regards to SMA. This is warranted due to ‘what it is?’ is still being debated and questioned. Apparent gaps seem to be attributed to its disparate conceptualisations and too broad a concept entails by the subject. Therefore, to better understand and appreciate the emergence of, and the requirement for SMA, a brief review on the evolution of management accounting is presented. Moreover, the underlying themes and concepts embedded in SMA advanced by its advocates are unravelled, and the elements of SMA information are put forward.

2.2 The Emergence of Strategic Theme in Management Accounting

Management accounting system is recognised as providing a most important source of formal information in an organisation (Hopwood, 1972). It plays a vital role in helping the managers of complex and hierarchical organisations by providing the information that enables them to plan, to organise, and to control (Kaplan, 1989; Horngren, 1996). As a control mechanism, it enables organisation to ensure that its sub-units act in a coordinated and cooperative fashion (Lebas & Weigenstein, 1986), and subsequently
serves as a catalyst for achieving organisations’ overall objectives (Lowe, 1971; Ouchi, 1979; Otley, Broadbent, & Berry, 1995).

In a more contemporary business environment, management accounting’s role is found to be extended to provide information that enables an organisation to pursue their strategic objectives successfully, and competitively. To a certain extent, management accounting information provides a strategic mean that essentially used by an organisation to execute plans and monitor their superiority relative to its competitors. For example, Mia and Clarke (1999) had found that management accounting information was used by organisations to facilitate them to adapt and implement plans in response to their competitive environment through its benchmarking information relative to other companies, and have consequently contribute positively to performance.

This development has shown the changing role of management accounting information. Parallel to the view, Roslender et al. (1998) commented that management accounting role itself has shifted from serving mere factory purposes to aiding directly meeting new market challenges through focusing information which is externally focused on the final goods market where companies make profits and encounter their competition. In line with the development, Bhimani & Keshtvarz, (1999) found a great involvement on the part of management accountants in strategic planning activities via providing data or analysis of different elements of strategic planning. The learning orientation of management accounting information is emphasised.

As a result of these development, today’s management accounting system has been called to change its emphasis from ‘narrow’ and ‘internal’ orientated towards more ‘management’ and ‘strategic’ in nature to commensurate with the new information requirement (Bromwich & Bhimani, 1989; Johnson & Kaplan, 1987). Nixon and Bruns (2005) reiterated that the control needs of current environment are significantly different from those developed in the earlier period and improvements are urgently required as companies must today compete on several bases simultaneously, whereby knowledge, competence and intangible assets (reputation, customer loyalty, and relationships) have become relatively more important drivers of competitive advantage.

In retrospective, formal management accounting has approximately been practised as early as mid 1800 (Solomon, 1968). The emergence and rapid growth of railways in the mid-nineteenth century was the major driving force in the development of management accounting system which was later adopted and extended in other business sectors due to the need to closely evaluate and monitor the efficiency of internal processes (Johnson & Kaplan, 1987). Nonetheless, the initial development phase bound to emphasis on the determination of product costs which stressed on cost allocation and absorption costing. Control was performed through surveillance
of direct labour, direct materials, and overhead costs (Ezzamel & Hart, 1987). Scientific management movement influenced much of this phase where organisations concentrated on improving the efficiency of the production processes by simplifying and standardising the operations and consequently need to refine their techniques for determining standards for cost control (Drury, 1996). Hence, inherited by the nature of its use, the emphasis was on ‘mere costing’ and efforts were devoted towards costs accuracy. This phase was marked as the pursuit of ‘absolute truth’ or the search for ‘true costs’ (Horngren, 1975).

However, when business expanded and decentralisation became essential, the former approach was criticised. It was argued that there was no such thing as ‘true’ cost applicable to every situation. As a consequence, the emphasis of management accounting has changed to incorporate the concept of ‘different costs for different purposes’ where ‘cost relevance’ (Ezzamel & Hart, 1987), or ‘conditional truth’ (Horngren, 1975) prevail. In this second phase, management accounting advocates argued that the cost of a product cannot be viewed as a unique unambiguous figure on which to base managerial decisions relating to such matters as pricing, product profitability, product mix, and management control. It depends on the purpose which the cost is meant for.

For example, the approach such as ‘transfer pricing’ was part of this development whereby it was in line with the concepts of responsibility centres (cost, profit, and investment centres). It was in this phase management accounting incorporates a ‘user-oriented’ or ‘user decision’ model approach to cost accounting and the element of ‘management’ was emphasis. Other examples, such as the concepts of ‘contribution’, ‘analysis of cost behaviour’, ‘overhead allocation’, emerged in the literature during this era. It was notable that emphasis of management accounting in the earlier phases was to fulfil organisation’s information requirement for meeting their optimisation and efficiency endeavour (Hiromoto, 1988) – or rather operational purpose.

In addition, during these earlier phases management accounting was mainly developed by engineers and practitioners (Scapens, 1990, in Abdul Khalid, 2003). As a consequence, the advocates advanced what they thought to be ‘the best way’ to do things. One notable drawback was the cost of information or the benefits that may be generated from alternative courses of action was neglected. As a remedy, the third phase adopted an ‘information-economics’ approach which influenced much of the development of management accounting techniques. Demski and Felthem (1976) in Ezzamel and Hart (1992) the pioneer of the approach asserted that due consideration must be given to available opportunities and prevailing tastes and beliefs. In other words, the desirability of information dependent on the purpose of the information and on the cost of producing more accurate measures (cost and benefits). The costs involve
in producing such information should not exceed the benefits. The concept such as *opportunity cost* was introduced in the course of decision making. It was during this phase that the application of mathematical modelling became apparent.

Nevertheless, inherited by its normative and prescriptive nature of earlier development, it is not surprising that limited appreciation was evidenced on the techniques suggested for financial decision making. This phenomenon was attributed to the failure of methods to meet the needs of decision-makers in a cost-effective way and the inappropriateness of competitive market assumptions (Scapens, 1991). As a result, theory and practice of management accounting found to be incongruent, where theory includes the various mathematical and statistical techniques while simpler techniques were preferred in practice (Scapens, 1991). Academics have been criticised as not addressing the practical aspects of practices and techniques they portray as useful for organisation (Otley, 1995), and worse of all claimed as irrelevant (Johnson & Kaplan, 1987).

Concern with the shortcomings of earlier development, researches in management accounting had changed in emphasis to a ‘positive’ approach to explain observed practices (Ezzamel & Hart, 1987). This view quite naturally prompted the search for reasons underlying observed practices. Management accounting researchers strive to understand the determinants of management accounting information usage. From this perspective, it rejected the notion of ‘universalistic’ way of setting up the management accounting systems, and recognising the context in which it operates (Hopwood, 1976). Perhaps, the birth of ‘Accounting, Organizations and Society’ journal in 1976 reiterated that management accounting should be seen in a broader perspective rather than exerting effort on its technicality. Hopwood in his editorial note express this concern as saying (Hopwood, 1976, p.1):

‘...Accounting has played important formal means of collecting, analysing and communicating information on the financial activities and performance of all forms of organisation...however, although recognised as important, all too often accounting has been seen as a rather static and purely technical phenomenon...’

It was during this era that management accounting has become increasingly conscious of the changing technological and organisational context of its operation (Ashton, Hopper, & Scapens, 1995). Greater emphasis was given on the control process (Ezzamel & Hart, 1987). Researchers incorporate organisational theory to explain the reasons behind certain practices and information requirements. For instance, contingency theory has been widely used by management accounting researchers since 1980s to explain that no one universal accounting system applicable to all organisations – it all depends on the context in which the organisation operates (e.g. Chenhall &
Morris, 1986; Gordon & Miller, 1976; Gordon & Narayanan, 1984; Khandawalla, 1972; Otley, 1980). Earlier researchers investigated the implication of contextual variables where technology and environment being the main on management controls system (MCS) design and use.

Thus far, the review reveals that the early development of management accounting has emphasised on operational control to achieve organisation’s objectives. Organisation measures their success purely on ‘bottom-line’ figure. As a consequence, management accounting information was extensively used to meet standards that were set during organisation’s planning stage. For example, standard costing was widely used to enable organisation to monitor their progress towards meeting budget through variance analysis. Moreover, attempts were devoted towards ‘accuracy of cost allocation’ to ensure cost assigned were accurate and reflective of the actual portion of cost. Implicit was its ‘short-term’ orientation. It was believe that concentration on efficient production through good cost control is sufficient to ensure good profits (Simmonds, 1981).

As a consequence, control system developed was based on ‘efficiency and optimisation’ theme whereby emphasis was given on ensuring that employees work towards organisation’s goals (Hiromoto, 1988). Thus, management accounting information was made available to fulfil this requirement of manufacturing control environment which concerned on optimisation and efficiency. Therefore, ‘output control’ and ‘behaviour control’ approach was commonly applied amongst manufacturer. In turn, management accounting information were characterised by internally driven, historical, and financial in nature. This has eventually been discovered as insufficient to serve the information requirement for organisation strategic achievement (Chenhall, 2003; Johnson & Kaplan, 1987; Roslender & Hart, 2003; Scapens, 1991). The criticisms become more appealing when strategy gain its prevalent in the 1980s for organisation to compete in the much intensified business environment (Langfield-Smith, 1997).

As a consequence, inherited by its importance in providing organisation information requirement the evolution in management accounting continues until recent years. Among others, it was prompted by the debate on the ‘relevance’ of management accounting which (traditional) struck quite considerable attention amongst academics. In the mid eighties Johnson & Kaplan provocatively criticised that management accounting information were irrelevant for managers’ planning and control decisions (Johnson & Kaplan, 1987). The main essence of their critics were management accounting as an information systems that should provide valuable inputs to managers for planning and control purpose has been tailored to suit external financial reporting requirements. The repercussion being, this system reported mere historical
Further criticism put forward was traditional management accounting system has failed to report information that formed the elements of competitive advantage such as quality, reliability, lead times, flexibility and customer satisfaction, despite the fact that those represent the strategic goals of world-class manufacturing companies (Drury, 1992). It is claimed that under the global environment, competitive advantage is of ultimate concern and companies’ management accounting could contribute mightily (Hiromoto, 1988). The traditional information characteristics claimed to have less relevance to inform managers on their organisation’s future survival (Hiromoto, 1991), and the most discomforting is the claimed that it may lead to inferior decisions (Asthon et al., 1995). Otley (2008) in concurring about the fact reiterates that the role of traditional management accounting is diminishing.

Notably, most of the concerns were claimed to be attributed to globalisation and market liberalisation which have made the market place to be open for entrants and exits of players with relax restriction, and thereby caused the market place to be unpredictable and uncertain, and competition intensified. Under this condition the business environment turns out to be characterised by escalating competition, changing competitive strategy, and product life cycle shorten (Morrow, 1992). In addition, because of the availability of choices and alternatives, the market turns out to be a buyer’s market, and further characterised by sophisticated, not loyal, and demanding customers, thereby product price, quality, and functionality become the key success factors (Cooper, 1996). Hence, this has posed great challenges to managers to consider more effective ways of achieving competitive advantage and improving organisational performance (Baines & Langfield-Smith, 2003), and management accounting information is no exceptions (Chenhall & Langfield-Smith, 1998b).

Therefore, most of the above developments have led to some crucial development claimed as remedies to the shortcomings of the previous development. For example, Simmonds (1981) advanced his concept of strategic management accounting which extends the traditional information to a more externally emphasis. In particular, he suggested for the inclusion and provision of competitor analysis in organisation’s management accounting system, i.e. important aspect of being competitive. Bromwich (1990) concur the concept and further emphasis on the importance of analysis of market information with regards to products. Roslender (1995) in turns calls for accounting for strategic positioning whereby management accounting is designed to assist senior management to secure, and subsequently to sustain competitive advantage as opposed
to its traditional function as scorekeeping, attention directing and relying on historical data which have little impact on organisational performance as they claimed.

Thus, management accounting system as an integral part of organisation information system has been called to undergo a radical departure from its internally, optimisation ridden, and historically based information towards more externally focused (Bromwich, 1990; Roslender, 2003; Simmonds, 1981) and market-driven (Bromwich, 1990; Drury, 1992; Hiromoto, 1988) in order to provide and serves the information requirements for meeting the ‘emerging challenges’. In particular, management accounting is called to provide information that enable organisation to evaluate the progress of their chosen competitive strategy (Simmonds, 1981; Bromwich, 1990). It is essential if competitive advantage is to be sustained (Drury, 1996).

Under this condition, organisations adopt a ‘market control approach’. Embedded in the approach are a form of comparative analysis and emphasis on continuous learning (Lebas & Weigenstein, 1986; Ouchi, 1979) that enabled strategic decision maker to evaluate their current achievement. The role of management accounting system under this perspective is to provide an on going information and analysis regarding organisation’s achievement (a reflection of its strategy success) relative to its rivals to enable decision maker to evaluate changes in their strategic position (Simmonds, 1981). For example, organisation practices competitor focused accounting to enable them to evaluate whether they are better off as compared to its core competitors in terms of costs, cost structure, and technology which will have a long term implication on performance sustainability (Guilding, 1999).

To sum up, this section has briefly presented some important developments in the field of management accounting which attempts to answer ‘why?’ strategic management accounting information is required. It is apparent that management accounting has evolved quite significantly if not radical since its earlier existence. Review of literature reveals that the role it plays in an organisation has commensurately changed with business environment, technological advancement, and the rise to prominence of strategy in recent years generally. In particular, the requirement for SMA exists due to the inability of traditional management accounting to serve the information requirement for organisation’s strategic purpose. Its traditional emphasis on short-term orientation (optimisation) and internal information (historical) claimed to be insufficient for organisation’s long term competitiveness, where long-term orientation (future oriented) and external information is more crucial for organisation’s sustainability (value creation) in current market environment.

Furthermore, the requirement emerges due to the need for organisation to closely monitor the performance of its strategy in achieving its organisational strategic
goals and objectives (Hoque, 2003). Today’s contemporary business environment is characterised by escalating global competition, demanding customers and short product life-cycle (Morrow, 1992). As a consequence, quality, costs, and continuous innovation are becoming more important strategic priorities and being the main strategic pursuit among organisation (Bromwich, 1992). Thus, SMA is claimed to be important mean to successfully achieve strategic goals through the provision and analysis of the strategic information provided by organisation’s management accounting system.

2.3 Strategic Management Accounting – Concepts and the Underlying Theme

The preceding section reveals that management accounting has evolved parallel with the development of technology and business environment. It is apparent that management accounting information has changed in emphasis in order to serve today’s organisation purpose. Earlier development has neglected the strategic information requirement. As a result, strategic management accounting is claimed one of the emerging developments that may restore the relevance of management accounting in its organisational settings (Bromwich & Bhimani, 1989). It is portrayed as a crucial means for organisation to achieve superior performance via its provision and analysis of strategic information relating to strategy formulation and implementation (Bromwich, 1990; Roslender, 1995; Simmonds, 1981). This section attempts to dwell on ‘what is SMA?’ recognising the apparent scarcity of documented work on the subject.

Noteworthy, review of literature further reveals that SMA development is still at its infancy stage and slow in pace, and what it should constitute is debatable. It is interesting to note that though SMA has been coined for more than two decades ago, only limited disjointed researches are available in the literature. Various perspectives have been put forth which attempt to define SMA, and pave some ways on how the matter may progress and further develop. As a consequence, SMA has also been interpreted and approached in different perspectives by respective researchers. There remains ample confusion regarding what SMA entails (Nyamori et al., 2001). Nevertheless, these advocates have implicitly highlighted some common themes and characteristics they claim as best featuring SMA.

The term SMA was first formally coined in accounting literature in the early 1980s. Simmonds, whom have much influenced the requirement for SMA has conceptually put forth the potential of management accounting in aiding organisation to sustain their competitiveness (Simmonds, 1981; 1982; 1986). He criticises the traditional management accounting such as internal cost-volume-profit (CVP) as being inadequate for strategic purpose and calls for externally focused management accounting that can aid managers in formulating and monitoring their organisation’s strategy (Simmonds, 1981). He conceptualises SMA as the provision and analysis of
management accounting data about a business and its competitors which is used for developing and monitoring business strategy. It is apparent that he emphasises on the importance of learning about competitor information in dealing with organisation’s strategic pursuit.

Quite apparently that Simmonds’s concern is on organisation’s competitive positioning in its industry which is the basic determinant of future profits and organisation’s value. Competitiveness is an outcome of organisation distinct capability relative to its competitors through creating competitive advantage (Barney, 1991). According to Simmonds (1981) this could be achieved through the provision of competitor’s information and analysis relating to costs and costs structure (prices and market share) whereby an organisation will be able to make comparison with its main competitors. He has also emphasised on the continuous monitoring on these information so that an organisation could ensure its long term survival by being superior relative to its competitors.

Inherited by the broad notion of SMA, the response amongst academic were not encouraging. Bromwich (1990; 1992) amongst the earliest who responded to the subject extends that SMA is crucial because of its ability to help managers to focus their efforts more on their markets (economics goods attributes) and ascertain cost positioning relative to its rivals (theory of contestable market). He argues that accounting has a role in providing management accounting information that enable an organisation to monitor its performance in the market place through optimum combination of product attributes and continuous monitoring its cost structure relative to competitor using a whole range of strategic variables over a decision horizon sufficiently long for strategic plans to come to fruition. In addition, concurring with Simmonds, Bromwich further reiterates on the need for organisation to know about its competitors.

In general, Bromwich has gone a step further by emphasising the importance of market factors in dealing with competition (Bromwich, 1990). It is apparent from the preceding discussion that today’s customer become sophisticated, disloyal, and demanding. This has forced organisation to concentrates on the matters pertaining to the product market to maintain its existing share or to attract new customers. Bromwich argues that organisation’s market share depends on the match between the attributes provided by its products and consumer’s tastes and on the supply of these attributes by competitors (Bromwich, 1992). Looking from this perspective, SMA is closely associated with marketing function. It emphasises that organisation should not only match their product and customers’ taste but also it should offer product that is distinct from their competitors. It might be distinct in terms of costs or attributes of the product offered.
It could be linked that the two advocates are in line with the concepts of competitive strategy postulated by Porter (1980; 1985). Bromwich in particular, very much assimilates Porter’s concept of cost leadership (i.e. emphasis on competitors’ costs structure) and product differentiation (i.e. emphasis on competitors and product attributes) in his argument. Porter (1980; 1985) postulated that organisation’s could compete either being the lowest costs producer (cost leadership), or by offering unique products (product differentiation) for creating a defensible position and outperforming competitors in a given industry.

Thus, two notable points emerge from Simmonds and Bromwich contentions about SMA. First, the importance of information and analysis of competitor costs, and costs structure as a means of creating competitive advantage is emphasised. With such information organisation could devote their effort towards creating their cost advantage compared to their core competitors which consequently leads to superiority in terms of pricing. Secondly, the importance of the information and analysis that reflects the value that market willing to accept. This perspective recognises marketing capability as the determinant of firm’s sustainable performance. SMA information serves as a mean of achieving competitive advantage (marketing capability) via continuously providing the management with comparative information and analysis on the strategic indicators which are external to the organisation, and future oriented in nature. Nonetheless, earlier advocates have been conceptual and how it could be crystallised is a matter of concern, and left too abstract a subject.

Other conceptual perspectives have been offered by Shank (1989) and a series of Shank and Govindarajan works (1988; 1989; 1992) through their concept of strategic cost management (SCM). Different from the former view, these authors incorporate accounting inputs to value chain analysis the concepts put forth by Porter (1980). For example, Shank and Govindarajan (1992) illustrated how value chain analysis using strategic cost analysis would result in different decisions compared to using traditional management accounting techniques. Shank (1989) argues that traditional management accounting often adopts a focus which is largely internal to the firm whereas SCM emphasis on managing cost for the entire value chain. The focus is external to the firm whereby individual organisation is seen in the context of the overall chain of value-creating activities of which it is only a part – from basic raw material components to end-use consumers.

Embedded in this concept is its continuous improvement on organisation processes throughout the value chain which subsequently has an implication on its costs structure. It recognises that cost information plays a role at each of business management cycle (Shank, 1989). Under SCM, organisation use the cost information explicitly directed at one or more of the four stages of the strategic management cycle.
(strategy formulation, communicating strategy, develop and carrying tactics, and develop and monitor success of strategy) carried out through value chain analysis, strategic positioning analysis, and cost driver analysis (Shank, 1989). The application of these analysis notably reflects the emphasis on strategic costs information where apparently traditional management accounting unable to fulfil these information requirements. It demands management accounting system information that is characterised by external and future oriented. For example, in monitoring the success of organisation’s strategy, it will require organisation to be able to compare the outcome of its strategy in the market relative to its competitors i.e. the ultimate goal of every organisation in order to sustain its competitiveness and consequently protect their long term survival.

While the advocates were arguing on the need for management accounting information to fulfil organisation’s strategic purpose, Hiromoto (1988) reveals that the key success factor of Japanese companies compared to their Western competitors was that they tailored their management accounting systems in such a way that support their continuous innovation through target cost management. It reinforces a top-bottom commitment to process product innovation by linking their management accounting system to their company’s strategies for innovation. It emphasises on continuous strategic thinking and act among employees. Nevertheless, distinct from SCM it considers the final market demand and work backward on the allowable targeted costs that the organisation set earlier in the development process which is termed as ‘market driven cost management’ (Hiromoto, 1988) and promotes continuous product innovation during research and development phase.

Thus, in brief it is apparent that the concepts advanced by the respective advocates distinct quite considerably from one and another. It spans from forwarding the analysis of information that claimed as crucial to be incorporated in organisation’s management accounting system to the individual techniques that could aid organisation to achieve their strategic pursuit. SMA being portray as competitive essentials. The review carried out reveals that three common themes emerge that can describe ‘what?’ SMA is. First is on the external orientation of SMA as opposed to internal oriented portrays by traditional management accounting. The respective advocates argue that management accounting system has to incorporate information and analysis on competitors, customers, and products to enable organisation to execute its strategic priorities especially with regards to cost management and their pursuit on product development. As been discussed somewhere in the preceding section, today’s environment companies compete in terms of price and differentiation simultaneously (Adler et al., 2000). Thus, by continuously providing the management (strategic) with information that relates to competitors, customers, and product, they will be able to make improvement where necessary.
Secondly, to enable organisation to foresee their strategic direction, the SMA advocates emphasise on future oriented information, whereby the information will have a long term implication to company’s future performance. Tillman & Goddard (2008) purport that organisation requires such information in its attempts to understand situations that may have occurred in the past, that might be occurring in the present, and that may also be anticipated for the future. In other words, the information (management accounting) feed for strategic purposes should not concern mere accounting period but reflect the achievability of organisation’s long term plan (strategy implementation). For example, information and analysis about customers will ensure that organisation has, as far as possible reflected in their strategic decision, and ideally will met customers’ preferences and generate future demand. This is also apparent when SMA put emphasis on learning elements of management accounting information (Coad, 1996).

Thirdly, it entails provision and analysis of information that are financial, non-financial, and qualitative in nature. This is apparent in line with the emphasis on SMA requirement for organisation’s sustainable competitiveness. Langfield-Smith (2008) concurs that the non-financial information is an important component of SMA. SMA information provides a form of indicators, or rather signal that will alert organisation whether competitive advantage has been achieved according to plan, or more importantly superior than competitors.

Notwithstanding to the theme underlying the respective advocates, the concepts put forward were too general and how it could be empirically tested bound to be problematic. Furthermore, what element to be included as SMA is also open for debate and the term itself entails too broad a concept. This could explain the paucity of published evidence on SMA. Nonetheless, these notable works can be the basis for further research endeavour. The review presented above implicitly suggested that SMA could be approached in two ways.

First is through addressing the fundamental question of information requirements that portrays strategic concern. This could be carried out through investigating the element of information and analysis that claimed by respective advocates as crucial for organisation’s strategic pursuit. Secondly, research can embark through looking at individual techniques that is claimed to constitute SMA. However, the issue of operationalisation in the latter is problematic due to the uncommon terms used among organisations (Guilding et al., 2000), and the generalisability is rather limited. In addition, it also recognised that it would seem unlikely that the adoption of any one specific SMA technique will meet the requirements of all contexts (Tillman & Goddard, 2008). As a result, the first approach is adopted in the current research simply attempting to unravel what SMA constitutes of and understanding the information usage by organisation.
To sum up, this section attempts to unravel ‘what is SMA?’. Briefly, SMA could be defined as management accounting information that is characterised by external, future-focused, and qualitative in nature used by organisation for their strategic pursuit. In particular, it could be further portrayed as information and analysis in relation to organisation’s competitor, customer, and product; the information that are crucial for organisation strategic achievement. Note that the elements are also claimed to be crucial for organisation’s strategy implementation and long term performance. However, the development has been conceptual and descriptive. To date, only a handful of documented empirical evidences are available with regards to SMA. As a consequence, much of the development can be considered as tentative and provide avenue for further research. Thus, the following section discusses and presents the findings of a pilot study carried out on manufacturing companies in Malaysia.

3 SMA’s Current Achievement – Malaysian Evidence

To recap, the current paper has been motivated by the scant attention given to SMA development. As a result, little is known about organisations’ take-up. Based on the limited empirical studies carried out, wide variations of SMA practices were reported (e.g. Guilding et al., 2000; Guilding, 1999). However, despite the previous findings, and the claimed infancy development of SMA, the current paper had revealed a more promising finding which portrays great potential of the subject. The result of the pilot study carried out by the current paper is presented below.

3.1 Sample

The manufacturing companies were obtained from the directory of Federation of Malaysian Manufacturers (FMM) year 2007 as the sample of the current research. Data was collected using mail questionnaire sent to top managers of the manufacturing companies. A total of 30 questionnaires were sent to randomly selected manufacturing companies, and only 23 questionnaires were returned and all were usable and used in the data analysis. Most of the companies were multinational companies (87%) and had been in operation for more than seven years. 28% of the companies had an average annual sale of RM5mil – RM50mil in the past three years while the others (72%) marked an average annual sales in the past three years of more than RM50mil. In terms of their focus market, 4.3% cater local market only, 26.1% cater for export market only, and 69.6% focus both local and export market. All respondents were top managers.
### 3.2 Variable Measurements

Inherited by the limited interest shown on SMA, sourcing established measurement bound to be limited. To date, an instrument by Guilding et al. (2000) had paved direction on how SMA information could be captured. They had distilled twelve practices as SMA surrogate. However, preliminary interviews carried out prior to the current research found that practitioners did not appreciate the technical terms utilised in the original instrument. As a result, the current research has refined the instrument and came up with a modified version consist of 26 items scale. Each respondent was required to indicate the extent of their organisations’ usage of SMA information for their strategic purposes which anchored by seven point Likert scales ranging from ‘1 = Not used at all’ to ‘7 = Greatly used’ followed by the 26 items scale of which the first 10 items measured competitor information analysis, 6 items measuring customer information analysis, and another 10 items measuring product-related information analysis. As mentioned in the earlier part, the current research had conceptualised SMA information as having three dimensions which are represented by competitor information analysis, customer information analysis, and product-related information analysis. The reliability statistics for each measurement is presented in Table 1. It can be seen that the Cronbach alpha of the three dimensions scored more than the suggested minimum coefficient of .60 which indicates the stability and consistency with which the instrument measures the concept and assess the goodness of a measure (Sekaran, 2003).

<table>
<thead>
<tr>
<th>SMA elements</th>
<th>Cronbach’s Alpha</th>
<th>No. of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitor information analysis</td>
<td>.933</td>
<td>10</td>
</tr>
<tr>
<td>Customer information analysis</td>
<td>.805</td>
<td>6</td>
</tr>
<tr>
<td>Product-related information analysis</td>
<td>.922</td>
<td>10</td>
</tr>
</tbody>
</table>

### 3.3 Results and Findings

The current research reveals some interesting findings which shed some lights on the development of SMA information usage among organisations. Previous researches had reported that SMA information appreciation and level of usage by organisations were rather limited (e.g. Cadez, 2006; Guilding, 1999; Guilding et al., 2000; Guilding & McManus, 2002; Rickwood et al., 1990). The most widely utilised information was competitor information analysis, while other SMA information (e.g. customer information, product-related information) was rather negligible (Guilding et al., 2000). However, result of the current research shows an interesting progress about the level of SMA information usage among organisations.
Table 2 above presents the descriptive statistics of manufacturing companies’ extent of usage of respective elements of SMA information. The level of most of the SMA information elements was highly used by the manufacturing companies. Most items scored a mean value above midpoint of the measurement scale of the seven point Likert scale. Mean usage of all SMA information elements ranging from 4.87 to 6.09. This finding contrasted with previous researches which suggested that the SMA information level of usage was rather limited (e.g. Cadez, 2006; Guilding et al., 2000; Guilding & McManus, 2002). The current research reveals that organisations (manufacturing in particular) had started to appreciate the importance of SMA information for their strategic purposes, which mainly to manage their market competition and strategy implementation. Thus, the importance of SMA information elements such as competitor information analysis, customer information analysis, and product-related information analysis are indisputable for organisation to craft their long-term achievement.

<table>
<thead>
<tr>
<th>Competitor information analysis</th>
<th>Min.</th>
<th>Max.</th>
<th>mean</th>
<th>Std. deviation</th>
<th>Theoretical range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate competitor’s costs structure</td>
<td>2</td>
<td>7</td>
<td>5.13</td>
<td>1.180</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Estimate competitor’s pricing</td>
<td>4</td>
<td>7</td>
<td>5.48</td>
<td>.994</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Estimate competitor’s profitability</td>
<td>2</td>
<td>7</td>
<td>5.09</td>
<td>1.311</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Estimate competitor’s market share</td>
<td>3</td>
<td>7</td>
<td>5.48</td>
<td>1.163</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Estimate competitor’s sales trend</td>
<td>2</td>
<td>7</td>
<td>5.30</td>
<td>1.222</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Appraise competitor’s R&amp;D investment</td>
<td>2</td>
<td>7</td>
<td>5.04</td>
<td>1.492</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Appraise competitor’s tech investment</td>
<td>2</td>
<td>7</td>
<td>4.87</td>
<td>1.217</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Appraise competitor’s cost reduction</td>
<td>2</td>
<td>7</td>
<td>5.35</td>
<td>1.229</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Appraise competitor’s quality program</td>
<td>3</td>
<td>7</td>
<td>5.35</td>
<td>1.301</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Appraise competitor’s growth rates</td>
<td>2</td>
<td>7</td>
<td>5.04</td>
<td>1.331</td>
<td>1 – 7</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Customer information analysis</th>
<th>Min.</th>
<th>Max.</th>
<th>mean</th>
<th>Std. deviation</th>
<th>Theoretical range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracks customers warranty claims</td>
<td>2</td>
<td>7</td>
<td>5.74</td>
<td>1.356</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Forecast customer future profits</td>
<td>3</td>
<td>7</td>
<td>5.43</td>
<td>1.237</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Customer profitability analysis</td>
<td>4</td>
<td>7</td>
<td>5.61</td>
<td>.891</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Forecast revenue streams</td>
<td>4</td>
<td>7</td>
<td>5.61</td>
<td>1.033</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Forecast on cost of servicing</td>
<td>4</td>
<td>7</td>
<td>5.61</td>
<td>1.076</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Forecast profit earned from customer</td>
<td>1</td>
<td>7</td>
<td>5.09</td>
<td>1.443</td>
<td>1 – 7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product-related information analysis</th>
<th>Min.</th>
<th>Max.</th>
<th>mean</th>
<th>Std. deviation</th>
<th>Theoretical range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitors value creating activity</td>
<td>3</td>
<td>7</td>
<td>5.39</td>
<td>1.118</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Cost management during R&amp;D</td>
<td>4</td>
<td>7</td>
<td>6.09</td>
<td>.900</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Track internal failure related costs</td>
<td>4</td>
<td>7</td>
<td>5.87</td>
<td>1.058</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Track external failure related costs</td>
<td>4</td>
<td>7</td>
<td>5.87</td>
<td>1.014</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Tracks prevention costs</td>
<td>3</td>
<td>7</td>
<td>5.48</td>
<td>1.082</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Tracks quality assurance related costs</td>
<td>3</td>
<td>7</td>
<td>5.74</td>
<td>.864</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Tracks product positioning related costs</td>
<td>3</td>
<td>7</td>
<td>5.26</td>
<td>1.322</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Tracks market penetration related costs</td>
<td>3</td>
<td>7</td>
<td>5.22</td>
<td>1.278</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Appraises cost across product life-cycle</td>
<td>3</td>
<td>7</td>
<td>5.48</td>
<td>1.082</td>
<td>1 – 7</td>
</tr>
<tr>
<td>Appraises product attributes</td>
<td>3</td>
<td>7</td>
<td>5.61</td>
<td>1.158</td>
<td>1 – 7</td>
</tr>
</tbody>
</table>
4 Discussion and Conclusion

As been highlighted in the earlier section the progress of SMA has been slow and rather daunting compared to its claimed importance by its advocates. To date, our knowledge on SMA has been conceptually descriptive while only a dearth of empirical evidences is available. In the light of this progress, the current research has enriched our knowledge on the current states of SMA information usage among organisation. Apparently, the current finding has rejected the notion that ‘SMA is just another figment of academic imagination’ posed by Lord (1996) who questions whether SMA is useful and applicable at all. The current finding reveals that SMA information does had great value to organisation.

To sum up, at least two apparent contributions by the current research that worth highlighting. First is from methodological perspective. Inherited by the limited source of measurement, the current research has advanced a set of 26 item scales for measuring SMA information elements. Guilding et al. (2000) found that there was negligible use of the term ‘strategic management accounting’ in organisation, and appreciation of the term amongst practicing accountants is somewhat limited. Thus, having use technical terms as their measurement of SMA in their study might have contributed to the wide variation reported. In addition, the result of a preliminary interview carried out prior to the current research has also reiterated the problem.

The second contribution is on the knowledge about the current state of SMA usage among organisation. As been reported in the earlier section, most of the samples were MNC with an average annual turnover of RM50mil. Though generalisation is limited due to the small number of sample (n=23), a general scenario could be set forth. The finding of the current research shows that organisation operating in today’s competitive market widely used SMA information elements which the current research has conceptualised as consisting of information analysis on competitor, customer, and product-related. This finding highlighted the importance of the information. Otley (1994) has reiterated that the key goal of contemporary organisation centres on the need for survival by adaptation and only those organisations which match their capabilities to the changing needs of the market place will survive in the long-term. Thus, the current finding may imply that the manufacturing companies have used SMA information to adapt the needs of the competitive market.

Inherited by the nature of the current research, the study’s findings should be interpreted in light of some limitations. Firstly is due to the small sample size (n = 23). Future researches should extend the sample size to a bigger sample size to be able to have a better variation and reveal sensible insights. Secondly, the current research was an exploratory study with the main objective to seek the level of SMA information
usage among organisation. Future research could consider designing a study that frame within a theoretical standing which perhaps could understand the antecedent and outcome of SMA information usage amongst organisation. This could offer better understanding on SMA related issue and could be used as a basis for further refinement of strategic management accounting system design by organisation.

References


The Impact of Foreign Direct Investment and Real Exchange Rate on Economic Growth in Malaysia: Some Empirical Evidence

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Abstract

This study is an attempt to examine the relationship between exchange rate and foreign direct investment towards economic growth in Malaysia during the periods between 1970 to 2011. The ARDL method was used to establish the long-run relationship as well as the direction of causation between variables. For this purpose two equations were estimated. The standard the bivariate relationship and the trivariate model includes the exchange rate variable. Both models exhibit strong evidence on long-run cointegration relationship. The impact of foreign direct investment in the long run equation found to be positive and significant, whereas the impact of real exchange rate is not. In the short run, both exchange rate and foreign direct investment found to be significant but slightly minimal in the percentage effect. We offer two possible reasons with regards to exchange rate movements in the short run as well in the long run, i.e. the hold-up effect and the price adjustment effect.

Keywords: economic growth, foreign direct investment, real exchange rate, ARDL

JEL classification: F21, F30, O40

1 Introduction and Selected Literature Review

The focus of this study is to examine the relationship between foreign direct investment and exchange rate towards economic growth in Malaysia for the periods of 1970 to 2011. There was some study done in the past but controversies on the empirical findings on the effect of exchange rate and FDI towards economic growth still exist.

There are also mixed results from the previous empirical research on the interaction of exchange rate, foreign direct investment towards economic growth. As for the case of exchange rate, according to study done by Aghion et al. (2009); Coudert & Dubert (2005), the exchange rate regime does play a significant role in affecting the performance of economic growth.
In many empirical studies, FDI generally has a positive effect on economic growth. The benefits of foreign direct investment (FDI) on the recipient countries can only be realized when the country has achieved a stable level of financial development. Stable political environment and sustained economic growth has made Malaysia one of good prospects for the inflow of FD. Strong economic growth remain and continue to be a necessary condition for Malaysia to attract FDI inflows (Ang, 2008). Low inflation and a stable exchange rate also act as catalyst in encouraging and attracting investment. This will eventually narrow the technology gap among developing countries.

The notion that other factors such as government spending, investment in human capital, the terms of trade as well as comprehensive tax structure also serves as a catalyst and a complement to economic growth. FDI will not only continue to promote economic growth, but also a catalyst for many downstream sectors.

Ang (2008) also argues that if the financial system is robust and transparent the ability to attract FDI will be more efficient and thus exploiting the benefits of that investment. No doubt much of the evidence found in previous studies indicate that FDI has a positive effect on economic growth (Adams, 2009), but the situation in which the negative effects of FDI on growth were also identified (Ang, 2009).

According to Aghion et al. (2009), exchange rate (volatility) does significantly affecting the economic growth when taking into account the level of financial development. This finding is robust when taking into consideration of various measurements of financial development and also its interactions. Additionally the volatility of exchange rate by itself did not play its significant role on the isolation.

According to Miles (2006), the ability of the exchange rate as the financial variables is likely to provide a positive impact on long-term economic growth. However, there is also an empirical study which shows that the exchange rate has the opposite impact.

There are two channels that have been identified in which the exchange rates might stimulate growth. Study conducted by Dornbusch (2001) found that exchange rate risk can only be reduced if the common currency implemented. This is because the common currency can balance between the interest rate and the risk of rising prices. In the meantime, a significant impact on minimized transaction costs in the context of international trade could be observed. Nevertheless, Slaughter (2001) refutes the idea because, according to another study, the effects are sometimes difficult to prove.

A country’s competitiveness is often represented by the stable real exchange rate (RER). This is because the RER is an indicator of the level of relative inflation and the relative cost of trading between and across countries. The relationship between RER
behaviour and economic performance is often seen as a key driver among countries such as Japan, Hong Kong, Singapore, South Korea, Taiwan and China (Eichengreen, 2008). The RER has a positive impact on output growth. Growth in output would be increased if RER is allowed to operate through aggregate supply and not aggregate demand channels. Nonetheless, RER instability generates risk and uncertainty, which in turn depresses growth and development of an economy.

The empirical evidences of the relationship between exchange rate and FDI flows are mixed. Froot and Stein (1991) argued that the presence of the capital market imperfections motivates the firms to invest abroad if their home currency appreciates because their relative wealth increases and will make external finance more costly than internal finance. Therefore, the study revealed that a real depreciation of the US dollar increases the FDI inflow in the US for the period 1973 – 1988. The relationship seemed to be more prominent in the industries with a higher level of potential information asymmetry such as chemical and machinery industries.

On the contrary, Stevens (1998) found a weak empirical support and showed evidence of serious instability in the Froot and Stein (1991) hypothesis. The study findings showed that the significant relationship between the exchange rate and FDI inflows disappear as the time series extended for an important sub period of the 1973 – 1988 periods and when the sample series extended through 1991.

Using the data from 1976 – 1986 periods, Kogut and Chang (1996) also concluded that the real appreciation of the Japanese yen lead to more entries of Japanese firms into the US. According to Blonigen (1997) the real exchange rate between the Japanese yen and the US dollar had a positive relationship with the number of Japanese acquisitions (proxy for FDI) in the US, especially in the manufacturing sectors.

The remainder of this article is organized as follows. Section 2 explains the methodology. The empirical results presented in section 3. The last section 4 concludes.

2 Data and Methodology

2.1 Data and Measurements

All data are gathered from trusted sources. Data on exchange rates, foreign direct investment (net inflow) and economic growth were obtained from the International Financial Statistics (IFS). All data observed annually from 1970 to 2011.

Data on exchange rates is the nominal (official) exchange rates denominated to US dollar, the annual monthly average. Data on foreign direct investment (net FDI
inflow) is based on the balance of payment on current US dollar. Data on economic
growth is proxied to industrial production index (IPIDX). The IPIDX is the total
production of manufacturing sector, the annual monthly average (2005 = 100).

In various literatures, there is a growing tendency of approximating industrial
production index, total energy production (or total electricity generated) and volume
of stock market traded each year as a close proxy to economic growth. However, the
uses of such proxy are subject to its pros and cons. For the purposes of our research
we tested only industrial production index (IPIDX).

The use of IPIDX as a close proxy to growth instead of real GDP was made after
taking into considerations few factors such as types of data frequency and the most important
one is based on theoretical aspect on the interactions between variables. Obviously, there
are differences in types of data observed for both exchange rate and IPIDX.

Data on IPIDX basically recorded on monthly basis. Whereas data for exchange
rate is basically observed in high-frequency mode normally on daily, weekly or monthly
basis. As all data in our research is based on annual observations, therefore for data
with basically observed in high-frequencies like IPIDX and exchange rate would
probably exhibits obvious discrepancies in the mean-deviations as a results of averaging
process. Thus affecting the precisions of the final results.

The nominal exchange rate transformed into real exchange rates (RER). The
RER basically the nominal exchange rates times a price ratio between foreign and
domestic. In this case, price ratio is proxied to the consumer price index (CPI) of
the two countries. The value of RER will reflect the competitiveness in the world
market. Higher (lower) value of RER will reflect the improvement (deterioration)
of the domestic economy. In other words, a rise (fall) in the real exchange rate index
indicates a real depreciation (real appreciation) of the local currency value of RER
will reflect the improvement (deterioration) of the domestic economy. In other
words, a rise (fall) in the real exchange rate index indicates a real depreciation (real
appreciation) of the local currency

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1 We also use real GDP per capital as to reflect the economic growth, however the sign on RER is surprisingly
unsupported.
2 \( \text{RER} = \frac{\text{WPI}}{\text{CPI}} \)
3 Price index for foreign country basically referred to the United States of America using wholesale price index (WPI)
with 2005 = 100.
4 There are some studies using real effective exchange rate (REER) instead of RER, however basically the sign and
magnitude of the results is almost similar.
2.2 Model Specification

The basic functional form adopted in this study is based on methods pioneered by Pesaran et al. (2001), the autoregressive distributed lag model or shortly ARDL. The ARDL method used to establish the direction of causation between variables using a single reduced form equation. Testing for cointegration between series is also a bit different to the conventional methods as proposed by Johansen (1988, 1995).

The ARDL approach does not involve pre-testing variables, in which tests on the existence of relationship between variables in levels is applicable irrespective of whether the underlying regressors are purely I(0), I(1) or mixture of both. This feature alone, given the characteristics of the cyclical components of the data. Thus makes the standard cointegration technique unsuitable when the existing unit root tests to identify the order of integration are in question. Furthermore, the ARDL method avoids the larger number of specification to be made in the standard cointegration test.

Amongst other advantages, the ARDL method of cointegration analysis is also unbiased and efficient for small samples (Narayan, 2004). One can also estimate the long- and short-run components of the model simultaneously, removing problems associated with omitted variables and issue on autocorrelations. Finally, the ARDL method can distinguish the dependent and explanatory variables. In what follows, the methodology is detailed.

The model is autoregressive, in the sense that \( y_t \) is explained by lagged values of itself. It also has a distributed lag component, in the form of successive lags of the explanatory variable. Sometimes, the current value of \( x_t \) itself is excluded from the distributed lag part of the model’s structure.

The process of dynamic adjustment is characterized by the following conditional error correction model (ECM), which can be used to test the existence of a long run relationship using the Autoregressive Distributed Lag (ARDL) bounds test as proposed by Pesaran et al. (2001).

\[
\Delta y_{t-1} = \alpha_0 + \beta_0 y_{t-1} + \sum_{j=1}^{k} \beta_j X'_{jt-1} + \sum_{i=1}^{p} \gamma_i \Delta y_{t-1} + \sum_{i=0}^{k} \sum_{j=1}^{k} \gamma_{ji} \Delta X'_{jt-1} + \epsilon_t \tag{1}
\]

where, \( X' \) is a vector of the determinants on \( y \). The optimal lag length of \( p \) is determined by Schwarz Bayesian Criteria (SBC).

The null hypothesis of the non-existence of a long-run relationship in equation 1 is tested as the accumulated F-test of \( H_0: \beta_0 = ... = \beta_k = 0 \) against the alternative hypothesis using the wald test of linear restriction.

\[ \text{1 The estimation is subject to provided all the variables are integrated of order 1, I(1).} \]
If the accumulated $F$-test is rejected at the prespecified critical value (normally 5%), then there is a strong evidence of long-run relationship (cointegration) and the equations estimating the long run equation is specified as Equation.2:

$$y_t = a_0 + \sum_{i=1}^{n} \theta_i y_{t-1} + \sum_{i=1}^{p} \sum_{j=1}^{k} \omega_{ji} X'_{j,t-i} + \mu_t$$

The test involves asymptotic critical value bounds, depending whether the variables are $I(0)$ or $I(1)$ or a mixture of both. Two sets of critical values were used which one set refers to the $I(1)$ series and the other for the $I(0)$ series. Critical values for the $I(1)$ series are referred to upper bound critical values; while the critical values for $I(0)$ series are referred to the lower bound critical values.

The causality version of ECM-ARDL at each $p$ lag specification in the short-run with long-run dynamics (with unrestricted constant) is derived as the following form:

$$\Delta y_t = a_0 + \sum_{i=1}^{n} \theta_i y_{t-1} + \sum_{i=0}^{p} \sum_{j=1}^{k} \gamma_{ji} \Delta X'_{j,t-i} + \eta E_{C_{t-1}} + e_t$$

The coefficient $\eta$, denoting the speed of adjustment for long run convergence as well as long-run causality coefficient. Whereas the coefficients of $\theta_i$ and $\gamma_{ji}$ denoting the short run dynamics towards the convergence to equilibrium. The $EC_{t-1}$ component entering equation 3 is a residual derived from the long run equation of Eq.2. The causality effect for each variable is now easily tested using the accumulated $F$-statistics of Eq.3.

Each of the variables $X'_{j,t-i}$ is said ‘Granger caused’ $y_t$ if each coefficient of $\sum_{i=1}^{p} \sum_{j=1}^{k} \gamma_{ji}$ statistically significant at the optimal lag of $p$ order.

3 Empirical Results

In general, time series data often exhibit component trend which is nonlinear that changes over time. The preliminary views of the $IPIDX$, $FDI$ and $RER$ are shown by Figure 1, Figure 2 and Figure 3 respectively.
It can be clearly seen that the IPIDX trend increases over time from 1970 to 2011. On the contrary, both FDI and RER show an obvious fluctuating cycle over time, with RER being slightly more volatile.

To avoid any problem related to spurious regression and biasedness of the results because of the uncertainty, instability and stationarity problems of the time series data, we conducted unit root tests such as ADF (Dickey & Fuller, 1979) and KPSS (Kwiatkowski et al., 1992) in order to check for the robustness of the stationarity of the variables. The results show that all variables series are stationary at first difference with both constant and constant and trend included in the test equations, except for RER which is found to be stationary at level using KPSS test when constant and trend (C T) is included in the test equation.

Although any other methods such as Engle-Granger (Engle and Granger, 1987) and Johansen (Johansen, 1988) techniques can be used to test for long-run cointegration relationship, but it only be used if all variables are I (1) or I (2). Since in our study there is one variable is found to be I (0) i.e the RER, therefore the use of ARDL is the suitable methods. The bound test approach proposed by Pesaran et al. (2001) will produce accurate cum stable estimations and the method is also proven to be suitable for a small or finite sample size as well.
The results are presented in Table 1 to 4. Table 1 shows the unit root test of each variable. As we can see there are mixed integrated degree of each variable. Table 2 shows the evidence of long run cointegration based on ARDL model as presented by equation 1. Whereas, Table 3 reports the LR equation as depicted by equation 2. Finally Table 4 reports the ECM-ARDL based model as presented by equation 3 together with the causality test.

**Table 1 Unit root test**

<table>
<thead>
<tr>
<th>Series</th>
<th>Term</th>
<th>ADF</th>
<th>KPSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnFDI</td>
<td>C</td>
<td>-1.838(8)</td>
<td>0.702**(5)</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>-2.582(8)</td>
<td>0.138*(3)</td>
</tr>
<tr>
<td>ΔlnFDI</td>
<td>C</td>
<td>-3.589**(9)</td>
<td>0.274(3)</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>-3.840***(9)</td>
<td>0.270(6)</td>
</tr>
<tr>
<td>lnRER</td>
<td>C</td>
<td>-1.238(1)</td>
<td>0.678***(5)</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>-2.731(1)</td>
<td>0.087(4)</td>
</tr>
<tr>
<td>ΔlnRER</td>
<td>C</td>
<td>-4.651***0(0)</td>
<td>0.118(2)</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>-4.594***01)</td>
<td>0.118(2)</td>
</tr>
<tr>
<td>lnIPIDX</td>
<td>C</td>
<td>-2.554(0)</td>
<td>0.812***(5)</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>-2.165(0)</td>
<td>0.156***(4)</td>
</tr>
<tr>
<td>ΔlnIPIDX</td>
<td>C</td>
<td>-5.457***0(0)</td>
<td>0.378(3)</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>-6.053***0(0)</td>
<td>0.063(2)</td>
</tr>
</tbody>
</table>

Notes: C: Test with constant term, CT: Test with constant and trend. Figure in parenthesis denotes lag length used for the unit root estimation. For KPSS, H0 is testing stationarity of series against unit root in H1. *, **, *** significant levels at 10%, 5% and 1% respectively.

**Table 2 The ARDL evidence of long run cointegration - bound test**

<table>
<thead>
<tr>
<th>ARDL Model</th>
<th>F_{stat}</th>
<th>Diagnostic</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnIPIDX^{(0,0)}</td>
<td>9.2486***</td>
<td>LM(2) serial=0.190 ARCH(2)=0.934</td>
</tr>
<tr>
<td>(lnFDI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lnIPIDX^{(0,0)}</td>
<td>11.3470***</td>
<td>LM(2) serial=0.615 ARCH(2)=0.502</td>
</tr>
<tr>
<td>(lnFDI, lnRER)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: LM serial refers to $\chi^2$ LM test of residual serial correlation, whereas ARCH refers to $\chi^2$ heteroscedasticity test based on the regression of squared residuals on squared fitted values. Both values refer to the level of significant.
### Table 3 Long run ARDL equations

<table>
<thead>
<tr>
<th>Model</th>
<th>Coefficient</th>
<th>t-stats</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnIPIDX (1, 0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lnFDI</td>
<td>0.1942***</td>
<td>5.1507</td>
</tr>
<tr>
<td>C</td>
<td>4.2140***</td>
<td>8.1825</td>
</tr>
<tr>
<td>lnIPIDX (1, 0, 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lnFDI</td>
<td>0.1997***</td>
<td>4.1025</td>
</tr>
<tr>
<td>lnRER</td>
<td>0.0295</td>
<td>0.9712</td>
</tr>
<tr>
<td>C</td>
<td>4.2229***</td>
<td>8.2478</td>
</tr>
</tbody>
</table>

Notes: * *, ** and *** indicate significance at the 10, 5 and 1 per cent levels respectively.

### Table 4 ECM-ARDL and causality test

<table>
<thead>
<tr>
<th>ECM-ARDL model</th>
<th>Coefficient</th>
<th>t-stat (sig. level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔlnIPIDX(1,0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔlnFDI</td>
<td>0.0843***</td>
<td>3.5854 (0.001)</td>
</tr>
<tr>
<td>ΔC</td>
<td>0.1829***</td>
<td>4.3516 (0.000)</td>
</tr>
<tr>
<td>EC t−1 − 0.0434***</td>
<td>−4.3571</td>
<td>(0.000)</td>
</tr>
</tbody>
</table>

Causality test

| ΔlnFDI ⇒ ΔlnIPIDX     | 12.8554*** |
| ΔlnIPIDX(1,0,1)        |             |                     |
| ΔlnFDI                | 0.0673***   | 3.0249(0.005)       |
| ΔlnRER                | 0.0737***   | 3.4684(0.001)       |
| ΔC                    | 0.1431      | 2.7811 (0.009)      |
| EC t−1                | −0.0339***  | −2.7827(0.009)      |

ΔlnFDI ⇒ ΔlnIPIDX     | 9.1501*** |
ΔlnRER ⇒ ΔlnIPIDX     | 12.0299*** |

Notes: * * and *** indicate significance at the 10, 5 and 1 per cent levels respectively.

It is worth to mention that in the long run, the effect of real exchange rate found insignificant even the sign is found to be positively related to growth. In the short run however, the effect of real exchange rate towards growth is significant. As the theory suggested, an improvement or real depreciation on exchange rate would significantly increase the aggregate output, in which the relationship only observed in the short run. In both models, the speed of adjustment for long run convergence as estimated by η coefficient of the EC_{t-1} variable only explains to approximately less than 5% which is marginally slow at high significant level.
A big question is now why in the short run the RER significantly affected the economic growth and not in the long run? We offer two explanations which are discussed in the following subsections.

3.1 Possible Break in Time Series

A closer investigation on the trend on RER shows that, there are possibilities of break in the data. One break observed in the periods of 1990 to 1997 and the second break was observed in the periods of 2005 to 2011. These two breaks were associated with strong exchange rate of Ringgit against the Dollar. The jump-up of the ringgit only happened during the periods of financial crisis started in mid-July 1997 until 2001 (i.e. the exact ringgit was pegged to US$ dollar started in 1999 until 2004 as exhibited in the data set.)

An additional test carried out whether the break in the time series does really exist. There are several well-known tests had been developed. We use the procedure of Zivot and Andrews (1992) and Perron (1997). These procedures test any break in trend on time series data at an unknown time, but the results do not show any serious and significant break even though there are break detected in the series.

Intuitively, the tendency of real exchange rate to appreciate in the long run does not giving enough impact to growth over time as the real depreciation of ringgit over US$ dollar is constantly increase over time. As the real depreciation of the Ringgit diminished by the effect of real appreciation over time, such interaction had continuously led to some kind of delayed or hold-up effect in the long run.

3.2 Price Adjustment

The other explanations that we could offer is that, there is a slight delay in the market clearing process in both financial and goods market. As according to some economist, even though the transmission mechanism will eventually clear all markets in the economy when the gap exist (as assumed by Walrasian approach), the response time between the two market react is different, goods market react a bit slow due to the price friction in the goods market.

The frictions in the goods market most probably disappear when consumers adjust their consumption bundle between domestic and foreign goods as the real exchange rate appreciate. However at in this particular point, as the substitution effect between foreign and domestic consumption goods was not easily observed due to the price ratio changes, the trade balance between consumption of imported goods and exported goods translated into low marginal increments on total aggregate demand.
4 Conclusion

The effect of FDI towards growth is indeed important as we can see from both equations in the short run as well as in the long run. The contributions of FDI towards growth in the long run were estimated approximately around 0.2%, whereas the effect of RER insignificantly low around 0.03%.

In the short run, both FDI and RER found to be significantly affecting production growth. The effect of FDI and RER estimated around 0.07% respectively with (marginally) slow speed of adjustment to reach long run convergence. The error-correction term was estimated around 5% and significant.

This slow adjustment process to reach a convergence in the long-run as shown by the ECM-ARDL in Table 4 has two possible implications towards production growth.

Firstly, the slow adjustment might probably due to possible break in the data i.e. the up and down trend in the time series of RER has at least slows the interaction process towards growth in the long run. Another possibility is that, there is a slight delay in reaching equilibrium in both markets i.e asset market and goods market. As asset market adjusts almost instantaneously to reach equilibrium but the goods markets is not. This would lead to some delay for both markets to interact in the long run. We refer this as a hold-up effect which triggered primarily through some delay in between the process of price adjustment.

References

The Impact of Foreign Direct Investment and Real Exchange Rate on Economic Growth in Malaysia:
Some Empirical Evidence


Appendices

**Figure A.1** Cusum (IPIIDX-FDI)

**Figure A.2** CusumSQ (IPIIDX-FDI)
The Impact of Foreign Direct Investment and Real Exchange Rate on Economic Growth in Malaysia: Some Empirical Evidence

Figure A.3 Cusum (IPIDX-FDI-RER)

Figure A.4 CusumSQ (IPIDX-FDI-RER)
Social Security: Case of Foreign Workers in Sabah, Malaysia

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Abstract

Social security programmes for migrant workers in ASEAN countries comprises of old age, invalidity, survivors, medical care, sickness and maternity (cash benefits) and employment injury. In the case of Malaysia, migrant workers in formal sectors are protected under the Workman Compensation Act 1952 which covers, among others, employment-related injury, medical benefit, old age and maternity benefit except for sickness benefit. Based on the findings, Malaysia has yet ratified neither the conventions nor the recommendations from International Labour Organization. The authors also found out that there are differences between local and migrant workers due to different sets of rules and regulations applied for both type of labour. Therefore this paper attempts to provide explanation of the above stated scenario based on case studies compiled regarding social security practised on migrant workers in Malaysia, particularly in the state of Sabah.

Keywords: social security, foreign workers, Malaysia

JEL classification: H55, J33, J61, N35

1 Introduction

The process of foreign workers' policy formation and implementation is a challenging obstacle for any nation in the world since it involves a consistency effort in order to cater the various and multi-faceted needs of a nation. Malaysia as in any other country is a foreign workers-employing nations took a unilateral approach seeing employed foreign workers in the allowed-industries as a national security issue. This explains the country’s strict policies in foreign workers influx that is manifested in its law formations and amendments pertaining foreign labour employment especially with regards to Human Rights Declaration 1948 (22) in conjunction with social security for legally employed foreign workers. This paper is structured as follows. Sections 2, 3, 4, 5 and 6 respectively outline the problem statement, conceptual framework, objective and method of the study and discussion of the findings. This followed by concluding remarks as the final section of the paper.

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\textsuperscript{2}This paper focused only on foreign workers legally employed in Malaysia, particularly in the state of Sabah.
2 Problem Statement

Malaysia’s dependency on foreign workers has been a long and distinctive phenomenon in its economic development endeavour. In the state of Sabah for example, the number of foreign workers in the labour market had increased from 3.5% (13,266) in the year 1970 alone to 55.8% (68,107) in 1996 (DayangSuriaHjMulia, 2000). In Sabah, the plantation sector relied heavily on foreign workers especially from Indonesia. For instance, up to year 2009, a total of 390,697 foreign workers are engaged in plantation and construction sector in Sabah (Utusan Online, 19 November 2009). The Federal Land Development Authority (FELDA) pointed out that it was due to local workers are not interested in the said sectors itself (New Sabah Times, 3 May 2011).

Why such study on the aspect of labour social security is crucial? In Maslow’s theory of hierarchy of needs, he puts security aspect as one of the basic needs of human beings. Therefore, to ensure individual can contribute productively in the labour market, this basic attribute of security needs to be fulfilled first. Midgley (2008) argued that workers’ social security can be seen as a contributor towards a nation economic development via development based on employment, to increase the quality of manpower and to protect workers from industrial contingencies. Also this is the very approach applied by Otto Von Bismarck in the development machinery industries in Germany by introducing workers social security protection such as insurance for disease (1883), accidents insurance (1884) and retirement insurance.

One of the Malaysian Government aspirations in its New Economic Model is to become a high-income nation. In pursuing such objective, economic transformation programmes would experience frictional unemployment. This is when social security fits into the picture taking the role as to facilitate labour transition during such period. However, Amirsham Abdul Aziz (2010) argued that the existing policies are not contributing to such role as it is more of work-related aspect rather than workers welfare.

In Malaysia, studies on the issue of social security are more focused on the dimension of social assistance to reduce incidence of poverty (Ragayah Hj Mat Zin et al, 2002; Nik Mohamed Amin, 1980). Rashidah Merican Abdul Rahim Merican (2010) discussed on the aspect of local labour rights on social security while Ong Fong Sim and Aizan Hamid (2009) looked into the general scenario of social security loophole in Malaysia. All in all, previous studies are more concerned on social security of local workers but not specific on foreign workers.
Therefore, motivated by such scenario, this paper intended to look into what extent does a legal foreign worker is protected in terms of social security policy in Malaysia? Is the current policy is sufficient or does it need further overhaul in the light of protection and enforcement?

3 Conceptual Framework

Esping-Andersen (1990) formed a typology of welfare regime that classifies social welfare of a nation into three aspects, namely, liberal, conservative and social democratic. Nevertheless, his typology formulation was based on the European communities context which is definitely differs significantly in comparison with most Asian countries, including Malaysia, in terms of cultural, political and economic settings. Kim (2005) argued that the application of Esping-Anderson typology to analyze the contextual welfare of Asians was a methodological mistake. Therefore, Aspalter (2006), Holliday (2000) and Kwon (2005) put forward an alternative explanation of the concept of Asian welfare state namely the Asian Welfare Regime which encompasses all aspects of social protection in a country. Since the scope of this particular paper is limited to foreign workers only, the appropriate conceptual framework to go about the matter is by using the standard International Labour Organisation (ILO) definition as pointed out in Convention 102 regarding workers’ social security. Based on the ILO’s definition as the conceptual framework, this paper discusses nine aspects of the foreign workers social security in Malaysia, i.e., medical treatment benefits, cash benefit for disease, unemployment benefits, pension benefits, job-related accident benefits, family benefits, maternity benefits, invalidity benefits and liabilities benefits.

4 Objective

This paper specifically discusses about social security policy regarding foreign workers in Malaysia which is still lacking. Therefore this paper aims to:

1. To scrutinise social security policies that protect legal foreign workers in Sabah, Malaysia.
2. To assess the extent of how existing policies are in line with the international labour standards.

5 Method of the Study

This study employed a qualitative approach in gathering data by referring to secondary sources like journals, legal policies and analysis of foreign workers compensation cases. Content analysis on documents pertaining Malaysian legal acts which among others, Work Compensation Act 1952, Employees Provident Fund Act 1991, Social Security
Act 1969 and Sabah Labour Ordinance) (2005 amendment). ILO’s conventions and recommendations obtained via their website, ILOLEX, which provided a complete list of countries that ratified with the ILO’s conventions and recommendations. An analysis was also conducted on selected case files regarding workers’ compensation for the period of 2007 – 2009 as obtained from Foreign Workers Division of the Sabah Manpower Department, Malaysia.

6 Findings

In general, foreign labour refers to individual who works outside his or her motherland/origin country. Nevertheless, the term used differs based on categorisation made whether on country of origin, skills or type of jobs. In Malaysia, foreign labour solely refers to only semi-skilled or non-skilled labour allowed to enter the country. In a broader definition, the International Labour Organization (ILO hereafter) defined foreign labour as:

“...a person who migrates from one country to another with a view to being employed otherwise than his own account and includes any person regularly admitted as a migrant for employment...”.

Basically, such definition merely refers to cross border migration to seek for employment and it does not clearly stated the legality of the workers’ status and as any working context a valid status of employment is an integral element in determining to what extent does a worker is protected by the existing laws and/or enactment. The importance to determine the legality status of a foreign labour is highlighted by Karim, et.al. (1999) which defined foreign labour as:

‘...a group of nationals who have legal right to work in a country where they have been officially recruited...’

This definition pointed out that a legitimate foreign labour refers to those formally recruited to work in a country and therefore their recruitment normally subject to the current policy and procedure practised by a country. By practice, foreign labours in Malaysia are recruited through registered job agencies in order to assist the government to monitor foreign inflow in the country.

In Sabah, as stipulated in the SLO, enacted under Section 1, Chapter 1(2) that:

‘...any worker whose passage to Sabah has been provided in consideration of a promise to perform work in Sabah...’.

Clearly this ordinance explained that foreign workers recruited by employers to Sabah are solely for job-purpose only and that employers are responsible to bear
the travel expenses of recruited workers particularly those from the Philippines and Indonesia. Table 1 below is a summary of demand for foreign workers since 1997 which shows an upward trend. Regularization Programme in 1997 recorded a total of 21,455 licenses disbursed to employers which involved 85,071 foreign workers. Even though license disbursement dropped in 2002, the total recruited increased to 80,792 compared to only 24,556 in year 2000. High labour demand and dependency in various sectors especially in construction and plantation sectors explained the hike in foreign workers recruitment in Sabah.

Basically, in order to recruit foreign workers in Sabah, employers must obtain the official permission from the state’s Department of Manpower. Regularization Programme in 1997 recorded a total of 21,455 licenses disbursed to employers which involved 85,071 foreign workers. Even though license disbursement dropped in 2002, the total recruited increased to 80,792 compared to only 24,556 in year 2000.

Table 1 below is a summary of demand for foreign workers which shows an upward trend. High labour demand and dependency in various sectors especially in construction and plantation sectors explained the hike in foreign workers recruitment in Sabah.

In general, there are two types of legislative policies which directly related with social security protection in Sabah. Firstly, policies that involved terms and conditions for protection and pension which is governed by two relevant acts namely, Employees Provident Fund Act (1991), EPF hereafter, and Sabah Labour Ordinance (SLO). The main objective of EPF is to provide financial protection for pensioners via monthly salary deduction of a certain proportion of their earnings. Meanwhile, the SLO protects foreign workers in job terms and conditions like job contract, wage payment, working hours and on-leave entitlement. All workers are subjected to both EPF and SLO Act including those of foreign workers. Secondly, policies regarding protection against accidents and job-related diseases. Both local and foreign workers are protected with two different set of acts. Social Security Act 1969 is meant to protect local workers whilst foreign workers protection falls under the Workman Compensation Act 1952. In line with this paper’s objective, the authors focused mainly on the Workman Compensation Act 1952.

<table>
<thead>
<tr>
<th>Year</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total License disbursed to employee</td>
<td>33,756</td>
<td>22,405</td>
<td>22,221</td>
<td>7,685</td>
<td>8,721</td>
<td>10,383</td>
<td>16,794</td>
</tr>
<tr>
<td>Total workers recruited</td>
<td>95,506</td>
<td>79,270</td>
<td>177,228</td>
<td>122,663</td>
<td>188,860</td>
<td>90,825</td>
<td>149,201</td>
</tr>
</tbody>
</table>

Source: Manpower Department, Kota Kinabalu, Sabah Malaysia, March 2011
6.1 Compensation for Workers – Aspect in the Pillar of Social Security

Why do we need security? Maslow’s Basic Needs theory stressed on the aspect of safety as one of its human basic needs theory and this includes men and women in any employment they engaged in. Midgley (2008) argued that workers’ social security seen as a factor that contributed towards nations economic progress through employment developmental strategies, advancement of the quality of employment pool and protection from industrialization consequences. In the same token, Otto Von Bismarck applied the social security approach to bring upon development in German machinery industries with the introduction of social security protection for workers in the forms of disease insurance (1883), industrial accidents (1884) and pension insurance (1889).

In Malaysia, literatures pertaining social security issues focused on the dimension of how it helps in poverty alleviation (Ragayah Hj Mat Zin et al., 2002; Nik Mohamed Amin, 1980). Those studies undoubtedly provided a quasi-complete reference on the current status of poverty among locals not involved in formal employment. Nevertheless, studies by Rashidah Merican Abdul Rahim Merican (2010), Ong Fon Sim and Aizan Hamid (2009) and Soh Chee Seng (2009) discussed exclusively on social security among local workers under the Social Security Act 1969 jurisdiction without any specific reference to foreign workers. At present, Jemon & Saiman (2011) explored the less-sought issue by providing case study on the practice of social security for foreign workers in Malaysia, particularly in the state of Sabah.

One of the current Malaysian Government key aspiration as pointed out in its New Economic Model is to become a high-income nation. In order to materialized such objective there will be trade-off and one inevitable effect is frictional unemployment. Therefore, to provide a counter-cyclical effect over such trade-off is to secure a labour social security network to ensure smooth transition should such frictional unemployment takes place. Clearly, this is a valid and crucial role of social security to complement and assist such transition. This transition should be carried out with careful consideration in mind that if such social policy is to be implemented it is bound without a negative re-countercyclical effect of dole mentality among workers.

Esping-Andersen (1990) welfare regime typology’s classified a nation’s social welfare institution as liberal, conservative and social democratic which is based on European context. Clearly, such classification is entirely different in comparison with most Asian countries including Malaysia in terms of cultural, political dan economic scenario. Kim (2005) pointed out that it is a methodological mistake to totally apply Esping-Andersen’s classification in analysing welfare in Asian countries. As a consequence, Asplater (2006), Holliday (2000) and Kwon (2005)
provided an alternative welfare state explanation through what is known as Asian Welfare Regime that took a general approach on welfare analysis in the said countries. As for the objective of this paper, both authors will solely focus on a conceptual framework that takes only foreign workers legally employed in Malaysia as the subject matter. For this purpose, authors are bound with the conceptual definition set upon by the International Labour Organization (ILO) Convention 102 on workers’ social security. With such definition at hand, nine aspects of social security of ILO’s, namely medical care protection, cash benefits, unemployment benefits, pension benefits, work-related accident benefits, family benefits, maternity benefits, invalidity benefits and liabilities benefits.

6.1.2 Compensation for Foreign Workers’ in Sabah, Malaysia

Prior to year 2011, foreign workers recruitment in the state of Sabah allowed only workers from the Phillipines and Indonesia to legally work in selected productive sectors namely, services, estates, manufacturing, constructions, fisheries, loggings, mining and domestic helpers. The scenario has changed when the Chief Minister State of Sabah given a green-light to take on male foreign workers from Bangladesh, Nepal, Myanmar and Vietnam to work in constructions, estates, agriculture and forestry sectors. Based on Table 2, out of seven aspects of social security in Malaysia, only Disease Benefits that does not cover foreign workers employed legally. This is due to the fact that the Workmen Compensation Act 1952 only disburse benefits if it is work-related diseases. Details for each elements will be discussed further in the following sections.

Table 2 Comparison of social Security for local and foreign workers in Malaysia

<table>
<thead>
<tr>
<th>Social security benefits</th>
<th>Local workers</th>
<th>Foreign workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pension</td>
<td>Employee Provident Fund Act (Compulsory)</td>
<td>Employee Provident Fund Act (Voluntary)</td>
</tr>
<tr>
<td>Invalidity</td>
<td>Social Security Act 1969</td>
<td>Workman Compensation Act 1952</td>
</tr>
<tr>
<td>Liabilities</td>
<td>Social Security Act 1969</td>
<td>Workman Compensation Act 1952</td>
</tr>
<tr>
<td>Medical</td>
<td>Social Security Act 1969</td>
<td>Workman Compensation Act 1952</td>
</tr>
<tr>
<td>Disease</td>
<td>Social Security Act 1969</td>
<td>-</td>
</tr>
<tr>
<td>Employment injury</td>
<td>Social Security Act 1969</td>
<td>Workman Compensation Act 1952</td>
</tr>
</tbody>
</table>
6.1.3 Pension Benefits – Employees Provident Fund (EPF)

EPF is an employee social security institution that is established under the Malaysian Employees Provident Fund Act 1991 (Act 452) which provides pension benefits to its members through old age savings scheme. EPF Act made it compulsory for all employers to fulfill their lawful and moral obligation to act on their employees in saving a portion of their salary. Unlike public and private sector workers, savings made by legally employed foreign workers in Malaysia is voluntary in nature.

Table 3 Comparison between members* aged 55 and less

<table>
<thead>
<tr>
<th>Shares</th>
<th>Savings rate until 55 years old (Section A, Table III)</th>
<th>Savings rate after 55 to 75 years old (Section C, Table III)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employers share</td>
<td>12%</td>
<td>6%</td>
</tr>
<tr>
<td>Employees share</td>
<td>11%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Total</td>
<td>23%</td>
<td>11.5%</td>
</tr>
</tbody>
</table>

Source: Employee Provident Fund, 2011
Note: *Foreign workers’ savings before 1 August 1998, saving rates equivalent to local workers

According to Table 3 above, foreign workers that opted to save before 1st August 1998 would have the equivalent rate of saving with local workers with saving rates for those aged under 55 is twenty-three percent (a combination of 12% by an employer and the remaining by a worker). Whenever they reached the age of 55, they are subject to half of the rate previously stated.

For those foreign workers opted to save after 1st August 1998, they are entitled to the same rate with the locals and for employers they are obligated with a RM5 flat-rate. The purpose of such rate is to cut-cost borne by employers and beginning from 1st September 2007, all EPF savings by foreign workers will ceased two months prior to their working permit duration. In terms of EPF withdrawals among foreign workers, those registered as active members are eligible to apply for all types of withdrawals like local workers entitled to. Conversely, if a foreign worker is registered as an EPF member on or after 1st August 1998, he or she is entitled to apply for Withdrawal Upon Leaving Host Country, disabled or death (application done by his or her heir).

6.1.4 Invalidity, Liabilities, Medical Treatment and Job Accident Benefits

All these benefits are guaranteed through Foreign Workers Compensation Act governed by Manpower Department under the jurisdiction of the Ministry of Human Resource of Malaysia. The 1952 Workmen Compensation Act protects foreign workers with valid and legal working permit liabilities (family members under his or her care) should he or she involved in job-related accident or death during the working period. Below are those foreign workers subject to protections:
received less than RM500 a month
manual labour job without salary limit and involved in job-related accident while working
not involved in working as domestic helpers (domestic workers)

The Manpower Department of Malaysia defined compensation as a payment to workers as a result of loss in income should the said workers involved in job-related tasks. Compensation insurance provides financial support to such unfortunate workers in order for them to cover for their medical, rehabilitation and miscellaneous costs. All foreign workers have the rights to be compensated by making a formal application and report to the relevant department.

Section 4 (1) (a) pointed out the obligation of employers to disburse any compensation, medical and rehabilitation costs (as allocated in Section 15) for any occurrence of job-related accidents. Employers must obtained insurance policy coverage from 24 panel insurance companies which is certified by the Malaysian government. Employers failure to abide such ruling will void any compensation procedures and will be deemed invalid and obstruct Workman Compensation Act 1952, Section 26.

Table 4 Employers obligations under Workman Compensation Act 1952*

<table>
<thead>
<tr>
<th>Law</th>
<th>Type of offences</th>
<th>Fines/Penalties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 13</td>
<td>Failure to report injuries</td>
<td>Fine RM5,000</td>
</tr>
<tr>
<td></td>
<td>First offence</td>
<td>Fine RM10,000</td>
</tr>
<tr>
<td></td>
<td>Second offence</td>
<td></td>
</tr>
<tr>
<td>Section 23</td>
<td>Failure to provide report/info</td>
<td>Fine RM5,000</td>
</tr>
<tr>
<td>Section 26(1)</td>
<td>Failure to purchase insurance</td>
<td>Fine RM20,000 or 2 years jail or both</td>
</tr>
<tr>
<td>Section 26 (5)</td>
<td>Deducts foreign workers salary to cover for insurance premium</td>
<td>Fine RM5,000 or 1 year jail or both</td>
</tr>
</tbody>
</table>

Source: Workman Compensation Act 1952
Note: Workman Compensation Act 1952 is applicable to foreign workers beginning from 1 April 1993

The jurisdiction provided under the Workman Compensation Act 1952 clearly stated the role of employers to protect the interest of foreign workers (see Table 4 above). For example, employers are obligated to report job-related accident incidence to the Manpower Department within 10 days. Failure to do so will have employers to be fined RM5000 for first offence and RM10000 for any subsequence offences. Any employers that failed to provide necessary document report needed by the department are also liable for RM5000 penalty. Clearly that insurance for accidents are liabilities for employers if their employee mostly if not all are foreigners. Each employer bearrougly around RM60-80 per head annually for insurance premiums. If any employer caught
taking a portion of their workers salary to cover the insurance costs will be subjected to a RM5000 fine or one-year jail or both.

Data obtained from Manpower Department of Sabah (see Table 5) shows a decrease in compensation claims by foreign workers in each categories from year 2004 to 2010. There are three types of compensation for eligible foreign workers to claim, namely Temporary Disablement (TD), Permanent Disablement (PD) dan Death. TD recorded 68 to 70 per cent claims on yearly basis and accorded as the highest among all categories. Unlike the hike in total compensation claimed, overall total compensation had decreased drastically from 986 claims in year 2004 to merely 286 claims in year 2010. Table 6 highlighted that 50% compensation was claimed by Indonesian workers.

**Table 5** Total compensation claims industrial injury by foreign workers 2004 – 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Temporary Disability</th>
<th>Permanent Disability</th>
<th>Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>1200</td>
<td>1000</td>
<td>600</td>
</tr>
<tr>
<td>2005</td>
<td>900</td>
<td>800</td>
<td>400</td>
</tr>
<tr>
<td>2006</td>
<td>600</td>
<td>500</td>
<td>300</td>
</tr>
<tr>
<td>2007</td>
<td>400</td>
<td>300</td>
<td>200</td>
</tr>
<tr>
<td>2008</td>
<td>200</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2009</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2010</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Source: Manpower Department of Sabah, 2011*
Table 6 Foreign workers country origin involved in industrial accidents in Sabah 2004 – 2010

![Compensation Claims: Country Origins](image)

Source: Manpower Department of Sabah, 2011

Table 7 Selected cases on foreign workers death compensation claims 2007 – 2009

<table>
<thead>
<tr>
<th>Case</th>
<th>Sector</th>
<th>Category</th>
<th>Total Compensation</th>
<th>Duration settled</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agriculture</td>
<td>Death Accident</td>
<td>RM25,000</td>
<td>14 months</td>
</tr>
<tr>
<td>2</td>
<td>Construction</td>
<td>Death Accident</td>
<td>RM25,000</td>
<td>17 months</td>
</tr>
<tr>
<td>3</td>
<td>Services</td>
<td>Death Accident</td>
<td>RM25,000</td>
<td>23 months</td>
</tr>
<tr>
<td>4</td>
<td>Construction</td>
<td>Death Accident</td>
<td>RM25,000</td>
<td>n.a.</td>
</tr>
<tr>
<td>5</td>
<td>Agriculture</td>
<td>Death Disease</td>
<td>Non-eligible</td>
<td>Case closed</td>
</tr>
</tbody>
</table>

Source: Foreign Workers Compensation Claims (2007 – 2009), Manpower Department, Sabah March 2011
note: n.a. (not available)

Survivor’s Benefit is one of the element under social protection for workers. Whenever a foreign worker died due to job-related tasks his or her heir will receives a maximum RM18000 which comprised of one month salary times 60 (in months). Whereas RM7000 served as an ex-gratia payment to the heir of the unfortunate worker. Based on findings of the case files (see Table 7) for Death categories, it took between 14 to 23 months for compensation claim to be fully settled. Such long settlement is due to the difficulty of employers to identify the worker’s heir, delayed in securing compensation cheques and incomplete compensation documentation necessary for a claim to be carried out. In other category involving death caused by diseases are not covered under the prescribed act.
6.1.5 Compensation and Social Security Policy in International Context

International labour policy for foreign workers are one of the instruments that protects them in a global scene. Nevertheless, adoption of conventions and recommendations put forward by international bodies and organizations are subjected and limited to countries that have fully ratified with the relevant conventions. Multi-policies that we have at the moment are by-products of migrational phenomena and problems faced by countries where those workers are originated from, host countries and foreign workers itself. Most of the obstacles faced by illegal foreign workers are obstruction of human rights and rights as workers, whereas for host countries the problems are more on economic and social in nature (Wickramasekera, 2002).

There are several conventions that are closely related with foreign workers and in that particular matter, the Migration for Employment Convention 66 (1939) focused on equal treatment for foreign workers recruitment, their settlement and working conditions. Furthermore, there are conventions that protects foreign workers against any sort of mistreatment behaviour or unjust, inhuman punishment and acts of tarnishing workers reputation. All those types of protection encompasses of medical services, viable and sound working condition and protection against discriminations. Currently there are six general conventions with regards to social security of which each is one of the social security aspects as pointed out earlier in this article:

i. Social Security Convention (Minimum Standard), 1952 (No. 102);
ii. Convention on Occupational Injuries Benefits 1964 (No. 121);
iii. Convention on Invalidity, Old-age Benefits and Faedah Orang Tanggungan, (No. 128);
iv. Convention on Medical Care and Disease Benefits, 1969 (No. 130);
v. Convention on Job Promotion and Unemployment Benefit, 1988 (No. 168);

Meanwhile there exist specific standards set forth by ILO that included foreign workers’ rights that ensure them to receives social protection in their originated country as stipulated in Convention of Equal Treatment (Compensation Injury), 1925 (No. 19). This particular convention specifically stated that equal treatment to all foreign workers that originated from their countries that have ratified such convention, especially on compensation due to employment injuries. The scope of this particular convention is wider since it covered the nine aspects of social security. For any accepted social security aspects, each country as member of the conventions are binded to it and should give equal treatment to foreign workers as those received by local workers. But such equality does not necessary applicable especially when it comes to benefits that are sourced out from public funds. Among ASEAN country members, only the Phillipines that have fully ratified with Convention No. 118.
Declaration on Promotion of Foreign Workers’ Rights and Protection [ASEAN 2007] recognized the very crucial role and contribution of foreign workers towards both receiving and sending host countries. And what matters are the commitment of ASEAN countries hand in hand to protect foreign workers’ rights. Although Cuddy et al., (2006) expressed concern over lack of social protection in ASEAN countries towards foreign workers especially in terms of access to public social services, such scenario is not a phenomenon exclusively occurs in ASEAN communities. Elsewhere in the global scenario it is happening and what differentiate among others are the level of resistance and form that took place.

Tamagno (2008) put forward a recommendation to widened foreign workers social security in ASEAN countries with a reciprocal notion through social security agreement among countries. The objective of such international agreement is to protect foreign workers and their families’ rights. With such agreement it coordinates national social security between two or more countries so that a cooperation would be more meaningful and fruitful especially for foreign workers as far as their rights are concerned. This is not a process of harmonization but rather a unification of social security protection between two countries involved. Table 8 indicates that only seven (7) out of nine (9) aspects defined by ILO are practised by ASEAN countries. Two aspects have yet existed in this region up to year 2007 are Unemployment Benefits and Family Benefits.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>BN</th>
<th>KH</th>
<th>ID</th>
<th>LA</th>
<th>MY</th>
<th>MM</th>
<th>PH</th>
<th>SG</th>
<th>TH</th>
<th>VN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pension</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invalidity</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Families</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Expenses</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment Injury</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: SSA (2007), Data adapted from Tamagno (2008: 31)

Note: Abbreviations are as follows: Brunei (BN), Cambodia (KH), Indonesia (ID), Laos (LA) Malaysia (MY), Myanmar (MM), Phillipines (PH), Singapore (SG), Thailand (TH), Vietnam (VN). Up to year 2006, social security programme has not been formally implemented in Cambodia.

Based on SSA (2007) Laos, Phillipines, Singapore, Thailand and Vietnam have all seven (7) social security programmes whilst Brunei, Indonesia and Malaysia only five (5) programmes. Due to the fact that ratification of ILO’s conventions and recommendations of social security programmes are voluntary in nature this explained why there were no obligations among countries to fully comply with all nine aspects mentioned thereof. This also gave insight of why SSA reported that Malaysia do not
have have protection pertaining Disease and Maternity Benefits. Nonetheless, in Malaysia’s context, Disease Benefits is readily available for foreign workers so long as it is a directly job-related disease. In terms of Maternity Benefits, the common practice in Malaysia applies for both local and foreign workers, for example, both type of workers are entitled for and have the rights to get a 60-day maternity leave based on SLO.

7 Conclusion

The focal premise of this article is to scrutinize issues pertaining workers’ welfare, particularly from the perspective of social security policy applied to legal foreign workers in Malaysia and to what extent it had protected them as it should. By using ILO’s definition of social security as the main crucial framework, it was found out that social security does exist to foreign workers’ in Malaysia even though such protection is not as complete and specific as it may seem. Why is it so? Firstly, coverage of such social security is not widespread as far as foreign workers are concerned due to the fact that social security policy does not equally spread between foreign and local workers.

This non-realization of policy can be explained by the fact that both local and foreign workers are governed by two sets of different rules and regulations. In conjunction with different governance of policy, type of protection and rate of compensation claims received by both foreign and local workers are undeniably differ. Secondly, Workman Compensation Act 1952 allocated that such social security does not apply to less-mentioned category of workers throughout this article i.e., domestic helpers (workers). However, non-coverage of such workers is countered by the mandatory regulation that employers must provide insurance for these domestic helpers and is indeed a justified indirect policy in protecting foreign domestic helpers in Malaysia.

The authors also found out that almost all ASEAN countries have not ratified ILO’s conventions and recommendations pertaining workers’ social security which made things difficult to create a sound social security policy that can be enforced as a unitarily joint-effort among countries in the ASEAN region. Finally, issue regarding minimum wage should also be incorporated since it is closely related with workers’ social security. However, there is currently no minimum wage policy nationally in Malaysia that covers local workers and that effectively brings us to nowhere when it comes to minimum wage for foreign workers. Nonetheless, this minimum wage issue could be a milestone towards further research regarding foreign workers’ welfare in future.
As noted earlier in this paper, the process of labour migration both directly or indirectly, had at least caused political, social and economical changes in a country. Policy initiation based upon the notion that influx of foreign labour as a supportive mechanism towards the instability of local labour market is undeniably not materialized or realized. Quoting Max Frisch: ‘We invited guest workers, and got human beings’ (ILO, 2004: 111). As human, of course we would treat foreign labour as human and as workers and it is the authorities’ responsibility to make sure that their rights are taken cared of. Therefore, willingly or unwillingly, the current and existing policies should take into account their rights as well. A sound policy on foreign workers will ensure a long lasting effort to identify a long-term policy that will not only protect and benefit the locals but will also provide foreign workers with rights as workers. This in turn will ensure a policy that is not just effective but it will also preserve the importance of both local and foreign workers’ rights.

The presence of foreign labour has in many ways affected local workers’ rights. Therefore, a social consensus can be further strengthened by the formation of a tripartite body to assist the government in planning, developing and implementing policies regarding foreign workers. All parties should work hand in hand to identify the current and dire needs of labour market and determine the best and effective possible way in managing issues arise with foreign labour. With this atmosphere at hand, an integrated and flexible policy is within reach and can be formulated to address current and future issues regarding foreign workers in Sabah particularly and Malaysia in general.

References


*Malaysia National Employment Return 2009.*


Technical Anomalies: A Theoretical Review

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Abstract

The validation of weak-form efficient market hypothesis (EMH) depends on the testing of random walk hypothesis (RWH) and the non-presence of technical anomalies. Once technical anomalies are discovered based on the interpretation of technical analysis, investors can exploit these opportunities to earn above-normal returns from price forecasting. Thus, it violates the weak-form EMH. As the weak-form is violated, it would imply that all stronger forms of EMH are not supported. Hence, the issue of technical anomalies should not be ignored in the EMH study. This study focuses on the theoretical review of several important forms of technical anomaly, including short-term momentum, long-run return reversals, stock price volatility clustering, calendar anomalies, and technical rules. Based on the review of literature, we suggest that the persistence of anomalies over long-period horizon has remained controversial. In practical, the reliability of the forecast power of technical analysis is important to show the relevance of technical anomalies in the EMH domain.

Keywords: technical anomalies, short-term momentum, long-run return reversals, volatility clustering, calendar anomalies, technical rules

1 Introduction

For the onset, it is important to clarify what is meant by the terms ‘anomalies’ and ‘technical anomalies’. Anomalies are trading opportunities that arise from strategies by which stock trading can result in above-normal returns (Hubbard, 2008: 217). Technical anomalies are anomalies discovered based on the interpretation of technical analysis. In which, technical analysis leans against three elements, including security prices, the repeatability of price trends in the market, and the fact that prices tend to enroll in some trends. The common graphical analyses are such as: the trend line which is given by consecutive points or the minimum or maximum prices of securities or stock indices, to show the direction of an observed trend; configurations of reversibility which is used to indicate the minimum and maximum levels of prices, correlated with the possibility of trend reversal; the support lines which are the minimum levels of prices where the market does not fall below it, and thus signal that the interest of buyers is strong enough to face selling pressure; the resistance lines which are the maximum levels of prices where the market could reach, and thus indicate that the
interest of sellers is strong enough to face the buying pressure; moving averages which are used to smooth the historical data for short-term or long-term in order to confirm the trend, using the methods of simple moving average, weighted moving average or exponential moving average; and gaps, the graphical configurations applied to confirm price movements (i.e. a gap is formed when the minimum price of a security in a given period is higher than the highest price of the previous period) (see Dana and Cristina, 2013). Such graphical analyses are useful tools in technical analysis, and are commonly applied in the stock price forecasting by technical analysts.

As far as past returns predictability is concerned, validating the weak-form EMH by only based on the testing of RWH using the commonly applied unit root tests method is considerable insufficient. In fact, the validity of weak-form EMH is much depending on the presence of technical anomalies. As Poterba and Summers (1987: 2) note, variance ratios are among the most powerful tests for detecting mean reversion in stock prices, but they have little power against the principal interesting alternatives to the RWH. In many previous studies, variance ratio and runs tests are seen useful to detect the presence of serial correlation in a stock series. Fama (1991) has suggested a broader coverage of weak-form EMH tests. This is a category of more general areas of test for returns predictability. In the category, it has covered the following areas of test: predicting returns from past returns (i.e. short-horizon returns, and long-horizon returns); predicting returns from other forecasting variables (i.e. expected inflation, short-term interest rates, dividend yield or dividend-price ratio, D/P, and earnings-price ratio, E/P); volatility tests; and seasonals in returns (Fama, 1991: 1576). However, Groenewold and Kang (1993: 408) show that, by estimating stock returns based on macroeconomic variables like money supply, real government expenditure, and price level, we can test for the semi-strong form EMH. Moreover, the D/P\(^1\) and E/P\(^2\) ratios reflect the fundamentals of stocks and thus are applicable to fundamental analysis. Therefore, they can be considered related to the semi-strong form EMH. In spite of using other forecasting variables, all the prior mentioned return predictability aspects are able to verify the presence of technical anomalies. Once a stock series is showing the presence of technical anomaly, market inefficiency is implied. If the weak-form EMH is violated, other stronger forms of EMH are not supported. In that sense, the issue of technical anomalies is significant in the domain of EMH.

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1 Dividend-price ratio (D/P) is referred to as dividend per share divided by the price per share. It is a company’s total annual dividend payments divided by its market capitalization. It is used to calculate the earnings on investment, that is, shares, considering only the returns in the form of total dividends declared by the company during the year. See http://en.wikipedia.org/wiki/Dividend_yield, retrieved on 7/4/2014.

2 Earnings-price ratio (E/P) is the inverse of price-earnings ratio (P/E). It is calculated by dividing the projected earnings per share by the current market price of the stock. Relatively low E/P anticipates higher-than-average growth in earnings, and vice-versa. See http://financial-dictionary.thefreedictionary.com/Earnings-Price+Ratio, retrieved on 7/4/2014.
This paper aims to provide a theoretical review of technical anomalies and offer a better understanding of the topic. The rest of the paper is organized as following: Section 2 is focused on short-term momentum; Section 3 is the review of long-run return reversals; Section 4 concentrates on stock price volatility clustering; Section 5 reviews about calendar anomalies; Section 6 is about technical rules; Last section concludes.

2 Short-term Momentum

Short-term momentum can be reflected by serial correlation or autocorrelation in stock prices (see French and Roll, 1986; Malkiel, 2003). That is, the prices are probable to keep moving in the same direction instead of changing to other directions. It is now a common practice to treat the terms ‘autocorrelation’ and ‘serial correlation’ synonymously (Gujarati, 2003: 443). Which, autocorrelations involve a variable and a lag of itself, for example, the correlation between $Y_{t}$ and $Y_{t-1}$ lagged $P$ periods (see Koop, 2009: 139). Stock prices may exhibit autocorrelations over short periods, such as intra-day, in a week, over a few weeks, within a month, or over several months. Once short-term momentum is confirmed having reliable predictability power, the EMH is violated for the stock series studied.

Literature offers some plausible explanations to short-term momentum. The contribution of Malkiel (2003) is on describing how psychological feedback mechanisms and underreaction of investors to new information can cause positive serial correlations. Firstly, short-term momentum is seen as consistent with the psychological feedback mechanisms. The so called bandwagon effect is believed can arise from stock market trading. When investors see a stock price rising, they are drawn into the market. Thus, we may think of when the price of a stock is seen going to plummet, investors tend to get out from the market quickly. Such psychological feedback mechanisms explain the logic behind observable successive moves of stock price in the same direction. Secondly, short-term momentum can be a result of investors’ underreaction to new information. It is possible that share prices do not fully adjust to new information immediately. If the full impact of an important news announcement is only grasped over a period of time, stock prices may exhibit positive serial correlation over the short-horizon.

Mispricing of stocks is a possible source of negative serial correlations. Stock can be mispriced and thus prices are not reflective of close intrinsic value for short periods, such as intra-day, weekly, monthly, and over weeks and months. French and Roll (1986) have documented two important factors in causing negative serial correlations:

3 Though, Gujarati (2003) clarified that these terms can be treated as different econometric terminologies, which autocorrelation is the lag correlation of a given series with itself, lagged by a number of time units, while, serial correlation is the lag correlation between two different series.
correlations in stock returns, namely, exchange holidays, and close-to-close returns. When concerning the factor of exchange holidays, both private information hypothesis and trading noise hypothesis would predict that, the return variances of stocks will be reduced and are unusually low on the trading day after exchange holidays, than on the trading day before exchange holidays. It is because prices adjust to corrections over some time. However, the public information hypothesis would predict that, there should be unseen significant reduction in return variances due to the factor of exchange holidays. Meantime, close-to-close returns normally contain measurement error because each closing trade may be executed at any price within the bid/ask spread. Thus, if these measurement errors are independent from day to day, we can expect that they will induce negative first-order autocorrelation of stock prices.

3 Long-run Return Reversals

Long-run return reversals are reflected from the evidences of negative serial correlation in stock returns over long period (see Malkiel, 2003: 63). Mean reversion of stock returns shows the tendency of stocks with high returns today to experience low returns in the future, and vice-versa (Hubbard, 2008: 218). Hence, it entails the returns predictability of the loser stock portfolios, as well as the winner stock portfolios. Stock price forecasts are possibly performed based on the past performance of particular stocks observed. Furthermore, the mean-reverting pattern of stock returns is presumed to be the anomaly of long-term returns which violates the EMH, until reliable exploitable trend for forecasting is clearly indicated.

In order to show the reasons of long-run return reversals, this review refers the underlying ideas of investors’ overreaction to recent information (see De Bondt and Thaler, 1985), and the slowly decaying component contained in stock prices (see Summers, 1986; Fama and French, 1988). De Bondt and Thaler (1985) find that, the loser stock portfolios experienced exceptionally large January returns as late as five years after the portfolio formations. Investors tend to overreact to recent information such as earnings and underweight base rate data. As it is known that prices are initially biased by either excessive optimism or pessimism, therefore, once investors foresee that returns will exhibit mean-reversion over long period, they perceive prior loser stocks are more attractive investments than prior winner stocks. Investors can use a contrarian strategy, that is, by buying the neglected stocks, as they expect the prices of these stocks will rise in the long-run.

Meantime, mean reversion of stock returns over the long-horizon is concerned with the slowly decaying component contained in stock prices. The mean-reverting component in stock returns tends to induce negative autocorrelation over the short-horizon, such as, for daily and weekly holding periods, which is rather weak but stronger for stock returns of the long-horizon. In which, negative autocorrelation is likely to
increase with time. This can explain why stock prices take long temporary swings away from fundamental values, and thus causing market inefficient (see Summers, 1986; Fama and French, 1988). However, Fama and French (1988) disagree with the anomaly discovered on this basis because random walk component is perceived still dominating in a stock series. Therefore, it is believed that such pattern may not have reliable predicting power which allows consistent earnings of above-normal returns. Timmermann and Granger (2004: 22) also argue on the reliability of anomalies. It is perceived that, once an anomaly has become publicly known, arbitrages will bring stocks back to intrinsic values. Thereby, anomalies tend to disappear from future samples. This complicates the use of statistical tests for price forecasting. Hence, the relevance of technical anomalies to the validation of the weak-form EMH has remained controversial.

4 Stock Price Volatility Clustering

In the literature of weak-form EMH, volatility tests belong to the area of the more general tests for EMH (see Fama, 1991: 1576). Volatility of stock prices is the tendency of stock prices to change or move in a trading range over time, whereby high volatility is characterized by a broad trading range and widely varying price trends, while low volatility is characterized by a narrow trading range and stable price trends (Thomsett, 2006: 187). Trading range can be referred to as the distance between a stock’s established high and low prices over a period of time (Thomsett, 2006: 226). Stock market volatility can be either a normal volatility or jump volatility. A normal volatility appears as the ordinary variability of stock returns, like ups and downs in return. While, jump volatility is the occasional and sudden extreme changes in returns (Beckett and Sellon, Jr., 1989: 21). In addition, according to Beckett and Sellon, Jr. (1989), the concern of the excessive volatility of financial assets’ prices is that, it may impair the smooth functioning of financial system and adversely affect economic performance.

In statistical terminologies, it is common practice to equate variance and volatility, and use variance as a measure of volatility. As discussed earlier, the random walk with drift model can be written as, \( \Delta y_t = \alpha + \varepsilon_t \), \( \Delta y_t = \alpha + \varepsilon_t \) which \( \Delta y_t^2 \) indicates the series with deviations from means taken, \( \Delta y_t = \Delta y_t - \Delta y \Delta y_t = \Delta y_t - \Delta y_t, \) where \( \Delta y_t = \sum Y_t / T \) \( \Delta Y = \sum Y_t / T. \) We can get the estimate of variance, \( \Delta y_t^2 \Delta y_t^2, \) by differencing the stock price data, taking deviations from means and then squaring it. The new time series data obtained is volatility. It is possible to use \( \Delta y_t^2 \Delta y_t^2 \) as an estimate of volatility at time \( t. \) High volatility is associated with big changes either in a positive or in a negative direction. As any number squared becomes positive, large rises or large falls in the price of an asset will imply \( \Delta y_t^2 \Delta y_t^2 \) is positive and large. It is sensible to think of, in stable time, the asset price will not be changing much and therefore \( \Delta y_t^2 \Delta y_t^2 \) will be small. Thus, the measure of volatility will be small in stable times and large in chaotic times (see Koop, 2009: 183-184).
Once stock returns exhibit volatility clustering, as in Magnus (2008: 7), when large changes in stock returns are followed by large changes, and small changes by small changes, investors can exploit this knowledge to predict future stock prices. Koop (2009: 184) explains the use of autoregressive model to model clustering in volatility of financial time series data. For example, an AR (1) model that uses volatility as the time series variable of a financial series, as following:

\[ \Delta y_t^2 = \alpha + \theta \Delta y_{t-1}^2 + e_t \]

The model describes that volatility in a period is depending on the volatility of previous period. If for instance, \( \theta > 0 \), then if volatility was unusually high last period, as \( \Delta y_{t-1}^2 \) was very large, it will also tend to be unusually high this period. Otherwise, if volatility was unusually low last period, as \( \Delta y_{t-1}^2 \) was very low or near zero, this period volatility will also tend to be low. However, the presence of the error, \( e_t \), means that there can be exceptions to this pattern. Though, this model hints that there tend to be intervals or clusters in times where volatility is low, and alternatively intervals or clusters where it is high. If such patterns allow for reliable price forecasting, then anomaly is considered present and the EMH is violated.

### 5 Calendar Anomalies

The dimension of seasonals in returns is well-accepted in the area of weak-form EMH studies. Calendar anomalies are abnormal stock returns associated with the turn of the year, the month, and the week, and they tend to occur at turning points in time (Karadžić, 2011: 110). For example, some seasonals in returns are consistent recurring patterns of stock series on the basis of weekly, monthly, or yearly. As such, calendar anomalies can arise from seasonals in returns. There are considerable calendar anomalies given by literature, including: turn-of-the-year effect, also known as the January effect, which is an increase in buying securities before the end of the year at a lower price, in order to sell them in January to generate profit from the price differences; the holiday effect, that is, the tendency of the market to do well on any day which precedes a holiday; turn-of-the-month effect, which is the tendency of stock prices to increase during the last two days and the first three days of each month (see Karadžić, 2011); and day-of-the-week effect, as investors can buy stocks on days with abnormally low returns and sell stocks on days with abnormally high returns (Basher and Sadorsky, 2006: 621).
6 Technical Rules

Some technical rules are documented in literature as having predicting power. Therefore, it is possible that anomalies can arise from technical rules. According to Karz (2010), two well-accepted technical rules are moving average and trading range break. In which, moving average shows that all the buy and sell signals are generated by a long and short moving average crossing. For example, by testing long moving averages of 50, 150 and 200 days with short averages of 1, 2 and 5 days, in order to observe whether the buy-sell differences are positive and also whether the t-tests for these differences are highly significant. Meanwhile, trading range break is used to refer support and resistance levels of security prices or indices. Technical analysts are seen believing that investors sell at the resistance level and buy at the support level. Hence, when the price penetrates the resistance level, it signals buying, and when the price penetrates the support level, it signals selling.

7 Conclusion

In sum, literature shows several important forms of technical anomaly, including short-term momentum, long-run return reversals, stock price volatility clustering, calendar anomalies, and technical rules. The long-term nature of technical anomalies is subject to controversial. Some economists argue that anomalies do not persist over long-period horizon, thereby are not reliably exploitable for above-normal returns in the long-run (i.e. Fama and French, 1988; Timmermann and Granger, 2004). The argument reflects strong believe in the validity of EMH which implies that stock series are characterized by a random walk process. Nonetheless, it is unavoidable to take into account the presence of technical anomalies when validate the weak-form EMH. When a stock series shows predictable pattern which can be reliably exploited for earning above-normal returns, the weak-form EMH can be rejected. In that sense, it is important to assess the practical reliability of the forecast power of technical analysis. An anomaly may disappear once it is known to public. Arbitrageurs may bring stocks back to their intrinsic values. In that case, the value of technical analysis is neglected.

References

Technical Anomalies: A Theoretical Review

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