Institutions and Economies
Vol. 10, No. 4, October 2018, pp. 1-18

Globalisation and Innovation Activity in Developing Countries

Chee-Lip Tee[a], W.N.W. Azman-Saini[b], Saifuzzaman Ibrahim[c]

Abstract: *This paper is an empirical assessment of the impacts of globalisation on innovative activity across developing countries. The focus is on the role of trade and capital account openness. Extreme-Bound-Analysis (EBA) approach is applied to analyse data from 58 countries over the 1996-2011 period. Though globalisation leads to greater interaction between countries through trade and Foreign Direct Investment (FDI), not all of these interactions affect domestic innovation activities. The result reveal only imports of machinery and equipment promote domestic innovation activity while there is insufficient empirical evidence to suggest that this relationship exists for imports of manufactured goods and FDI inflows. This finding is consistent with the view that import is a more important channel for technology transfer than FDI.*

Keywords: FDI; Import; Extreme Bound Analysis; Developing Countries
JEL Classification: F14, F21, O31

Article received: 17 November 2017; Article accepted: 20 July 2018

1. Introduction

There is greater trade interactions between countries compared with decades ago due to globalisation, which means physical distance is no longer a barrier (Borchert & Yotov, 2017). This is coupled with liberalisation of trade and investment policies in most countries. During 2001-2015, 78% of the 1,536 policies worldwide were aimed at liberalisation and promoting investment (UNCTAD, 2016) while the average world tariff rate reduced from 9.68% in 2001 to 6.18% in 2010, thus, creating a more favourable environment for trade.

[a] Corresponding Author. Faculty of Management Multimedia University, 63100 Selangor, Malaysia. *Email: cltee@mmu.edu.my*
[b] Faculty of Economics and Management Universiti Putra Malaysia, 43400 Selangor, Malaysia. *Email: wazman@upm.edu.my*
[c] Faculty of Economics and Management Universiti Putra Malaysia, 43400 Selangor, Malaysia. *Email:* saifuzzaman@upm.edu.my

As a result of these policy changes, foreign direct investment (FDI) and trade in goods and services grow faster than the world output in recent decades. According to United Nations Conference on Trade and Development Statistics (UNCTADstat), the average growth rate of global world trade activities (both export and import) is 6% while the average growth of FDI inflow is 13% between 1981-2015 compared with the average output growth of 2% in the same period. Additionally, both trade and FDI registered higher growth rate among developing countries than developed countries. The average growth rate of trade and FDI in developing is 8% and 18% respectively but only 5% and 14% respectively among developed countries. In other words, developing countries gain relatively more from globalisation. This coincides with the presence of multinational corporations (MNCs) in emerging markets, such as China (Fabre, 2014) and India (Jha & Krishnan, 2013) in order to improve their competitiveness while accessing local market.

Policies related to trade liberalisation are motivated by the expectation that the domestic economy will gain from a greater volume of trade and capital inflow (Coe & Helpman, 1995; Potterie & Lichtenberg, 2001). Many empirical studies confirm the cumulative impact of foreign technology through trade, FDI and other channels as an important determinant of growth in the host country. This is crucial for developing countries as, though innovation activities are found to play a significant role in enhancing technological improvement (Aghion & Howitt, 1992; Romer, 1990), limited investments in innovation among developing countries mean technology transfer plays a vital role in productivity growth (Coe, Helpman & Hoffmaister, 1997).

Additionally, technology transfer can, however, affect domestic innovation effort. Domestic firms could adopt foreign technology with less uncertainty instead of developing their own technology and could learn from the transfer of technological knowhow and improve their own knowledge base. It then encourages innovation activity as it is now easier than before. Without understanding the impacts of technology transfer, policies related to trade and investment could be less effective. For instance, globalisation process might not only benefit the country in term of promoting productivity but it also has potential negative effects on domestic innovation activity. Nevertheless, little is known about the impact of technology transfer on domestic innovation activity. This is especially important for emerging market as the limitation of traditional export-led growth model had been proven in the recent global crisis (Fabre, 2014). The gap of knowledge in this area has therefore motivated this paper to address the impacts of technology transfer induced by globalisation on domestic innovation.

The objective of this paper is to investigate the relationship between technology transfer channels (i.e. trade and FDI) and domestic innovation activity in developing countries. This paper analyses the imports by disaggregating data based on technology components as discussed by Coe et al. (1997). In order to achieve the objective of this paper, the Extreme-Bound-Analysis (EBA) approach introduced by Leamer (1983, 1985) and modified by Xavier (1997) is used on data from 58 countries during the period 1996 to 2011. The findings reveal that among all spillover channels (i.e. total import, import of manufactured goods, import of machinery and equipmentand FDI), only import of machinery and equipment is found to be significant and has a positive effect on domestic innovation activities. These findings shed new lights on the complex nature of linkages between globalisation and innovation.

The remainder of this paper is organised as follows. Section 2 reviews literature related to this topic while Section 3 reviews the methodology used to test the hypothesis. Section 4 presents the empirical results of using while the last section summarises and concludes the paper.

2. Literature Review

The importance of technology inflow for developing countries has been debated extensively in the literature. In a study on developed countries, Coe and Helpman (1995) showed empirical evidence that foreign technology promotes domestic productivity via trade. Complementing this, Coe et al. (1997) discussed this further in the context of developing countries and confirmed the significance of import as an important channel for knowledge spill overs to developing countries. They found that import of capital goods and high-tech products, such as machinery and equipment, have a greater impact on productivity than imports of other types of goods. These studies suggest that openness to trade enhances domestic productivity through four channels: access to a variety of products and equipment, a communication channel that stimulates cross-border learning, adopt foreign technology to local conditionsand imitate foreign technology or even develop new technology from it (Coe et al., 1997). Meanwhile, Potterie and Lichtenberg (2001) argued that foreign technology does not only spill over to domestic economy through trade but also via FDI. Specifically, domestic firms have the opportunity to imitate technology from foreign firms, as they are forced to improve efficiency due to greater domestic competition. In essence, the local firms will learn to engage in international trade through collaboration or imitation. Additionally, domestic workers will also acquire new skills when they work in a foreign firm and this new knowledge may spill over to local firms once they join

local firms (Gorg & Greenaway, 2004). There are many studies that have discussed the importance of technology transfer on domestic productivity. However, only a few focused on the impacts of technology transfer on domestic innovation activity. Most studies that have analysed domestic innovation activity examined the internal factors. For instance, higher income implies greater allocation and incentives for the firms to engage in R&D in order to improve profitability (Bebczuk, 2002; Braconier, 2000; Cumming & Macintosh, 2000). At the same time, a bigger market acts as an incentive for the firm to get involved in R&D investment and consumers prefer differentiated products if they are wealthier (Wang, 2010). Other than promoting domestic innovation, it is also crucial to promoting technology transfer as internal demand which can attract foreign knowledge provider such as MNCs (Pueyo, García, Mendiluce & Morales, 2011). Nevertheless, not all agree with this theory. It is suggested that income might have a limited role in determining allocation for R&D if the latter's target is exogenously set by the government, such as European Council (Wang, 2010). Besides, greater income also leads to greater risk aversion and thus, discourage risky R&D investment (Cumming & Macintosh, 2000).

Human capital is also positively related with economic development, which in turn promotes innovation activity (Cheung & Lin, 2004) for both developing countries (Bebczuk, 2002) and developed countries (Wang, 2010). This has made the stock and intensity of human capital as a major determinant for innovation activities in previous studies. Meanwhile, Teitel (1987) has linked this with the income level of an economy as more scientists and engineers are prefer to work in higher income countries.

Rate and level of investment are important determinants of innovation. They complement R&D investment from the view of aggregate production. It also substitutes R&D investment as both compete for limited resources (Bebczuk, 2002; Wang, 2010). Thus, the investment rate of an economy could have both complementary and substitute effects on the innovation effort and it may also depend on the characteristic of the country. For instance, a negative relationship was shown by Bebczuk (2002) and an insignificant one by Wang (2010).

The population also matters as a country with a large population has greater manpower for innovation (Teitel, 1987, 1994) although Furman, Porterand Stern (2002) argued that greater population discourage innovation activity due to lower GDP per capita. Hu and Mathews (2005) explained the insignificant relationship where the population in latecomer countries is not expected to have a significant impact on early-stage innovation. Meanwhile, after controlling for prosperity and technological sophistication, greater population size could discourage innovation due to lower GDP per capita (Furman et al., 2002).

Previous studies have highlighted the role of government in innovation activity: it creates both crowding-in and crowding-out effects on private expenditures (Linnemann & Schabert, 2004). Government spending in R&D also reinforces innovation in infrastructure and promote private investment in innovation (Bebczuk, 2002; Furman et al., 2002) though it has substitution effect, especially among latecomer countries which rely more on public R&D investment (Hu & Mathews, 2005). Thus, there is less innovation activity in countries with deficit budget Wang (2010).

There are, however, limited studies that have analysed the influence of external factor on domestic innovation activity, i.e. technology transfer from foreign countries. Arguably, technology transfer has both positive and negative impacts on domestic innovation activity (Lu, Tao & Zhu, 2017). The theory predicts that both trade and financial liberalisation will promote competition in domestic market. Domestic firms are therefore, expected to innovate in order to stay competitive by improving the quality of their products (Wang, 2010). Nevertheless, it might work in another way. Since R&D investment is risky, domestic firms would reduce their spending for R&D activity due to lower profit and greater competition (Veugelers & Houte, 1990).

The impacts of technology transfer on innovation activity are also ambiguous due to access to foreign knowledge base. On one hand, technology transfer generates opportunity for domestic firms to learn about the foreign knowledge which is absent in domestic knowledge base. The domestic economy is therefore encouraged to involve in R&D activity that otherwise is impossible, or at least difficult, due to the lack of necessary skills and knowledge. On the other hand, foreign technology precludes the need for one's own R&D. Domestic firms can adopt foreign technology with less uncertainty instead of developing their own technology (Un & Cuervo-Cazurra, 2008). As suggested by Wang (2010), the main source of new technology is OECD countries (Wang, 2010).

3. Methodology and Data

3.1 Model and variable measurement

This paper adopts EBA approach, which was first developed by Leamer (1983). The advantage of using this methodology is that it provides robustness and sensitivity analysis of the variables (Wang, 2010). This approach involves varying the subset of control variables included in regression to find the widest range of coefficient estimates on the variables of interest. By varying the subset of control variables and repeating the

estimations, it generates a more robust result of the parameter estimates of the hypothesis to be tested.

Based on Wang (2010), the general specification of the estimated model is as follows:

$$Y = \beta_I I + \beta_m M + \beta_z Z + \varepsilon \quad (1)$$

where *Y* is the dependent variable, which is domestic R&D intensity representing host country's innovation effort, *I* represent the variable that is an important determinant to the dependent variable, *M* is the variable of primary interestand *Z* is explanatory variables.

These explanatory variables (i.e. *I* and *Z*) are selected based on literature findings. The endogenous growth theory suggests human capital as a major determinant of innovation capacity and therefore, it is considered as *I* variable. It is represented by the ratio of the population aged above 25 years having tertiary education. Meanwhile, the *Z* variables consist of several other variables which are hypothesised to influence R&D activity. Variables proposed in previous studies such as income (Bebczuk, 2002; Braconier, 2000; Cumming & Macintosh, 2000), population density (Furman et al., 2002; Hu & Mathews, 2005; Teitel, 1987, 1994), ratio of fixed capital formation to GDP and its growth rate (Bebczuk, 2002; Wang, 2010), the role of government including expenditure, imbalances and spending in R&D (Bebczuk, 2002; Furman et al., 2002; Hu & Mathews, 2005; Linnemann & Schabert, 2004), indicators of business cycle including inflation and unemployment rate (Aghion & Howitt, 1992, 1994; Bean & Pissarides, 1993; Wang, 2010) are included in the model.

The variable of interest, *M*, is the main focus of this paper which is to analyse the impact of technology transfer on domestic innovation. It consists of two technologies spill over channels namely, import and FDI. Thispaper examines both channels since they are viewed as major technology transfer channels in many studies (Azman-Saini, Baharumshah & Law, 2010; Azman-Saini, Law & Ahmad, 2010; Coe & Helpman, 1995; Coe et al., 1997; Coe, Helpman & Hoffmaister, 2009; Durham, 2004; Tee, Azman-Saini, Ibrahim & Ismail, 2015). There are three measures of imports: i) ratio of total import to GDP; ii) ratio of manufactured goods import to GDP; iii) ratio of machinery and equipment import to GDP. The rationale to include three different import channels is to analyse if the influence differs if there is higher technology level (Coe et al., 1997). Thus, the following hypothesis is developed:

> Hypothesis 1: *Technology transfer has no impact on domestic innovation activity.*

The hypothesis is then being extended to provide a clearer picture regarding the influence of technology transfer by analysing different spill over channels as discussed earlier:

> Hypothesis 1a: *Technology transfer through total import has no impact on domestic innovation activity.*
>
> Hypothesis 1b: *Technology transfer through the import of manufactured goods has no impact on domestic innovation activity.*
>
> Hypothesis 1c: *Technology transfer through the import of machinery and equipment has no impact on domestic innovation activity.*
>
> Hypothesis 1d: *Technology transfer through FDI has no impact on domestic innovation activity*.

3.2 Model and variable measurement

The EBA estimation involves several important steps. It begins with the estimation of "base regression" which includes only variables I and M. Then, regression equations for all possible linear combinations is estimated up to three Z variables. The next step is to identify the highest value and lowest value for the variable of interest (βm) which cannot be rejected at the 5% significance level (Levine & Renelt, 1992) or 10% significance level (Wang, 2010). After that, extreme bound is defined by a group of Z variables - maximum and minimum values of βm plus two standard errors. This extreme bound is used to infer the confidence of partial relationship between dependent variable (i.e. R&D intensity) and independent variables. The relationship is considered as "robust" if βm remains significant and has the same sign within the extreme bound. If it is not the case, where βm does not remain significant or the sign is different, the relationship is indicated as "fragile" since alternation in conditioning information set changes statistical inference regarding dependent variable and variables of primary interest.

Nevertheless, this criterion has been criticised by Xavier (1997) as too stringent. The author argues that if the distributions of parameters have some positive and some negative support, then one would find at least one regression with a changed sign if enough regressions are run (Dreher, Sturm & Haan, 2010). Thus, this paper uses the alternative criterion proposed in Xavier (1997) which is based on the entire distribution of the parameters, or cumulative distribution function (CDF) across regressions. Instead of only "robust" vs. "non-robust" classifications, this approach would assign some levels of confidence to the variables. Compare a

parameter with 95% and 50% of density function respectively lies right to the zero; the former is considered more likely to correlate with dependent variable than another. Following this approach, a variable is considered as robust when 90% confidence interval around the parameters is entirely on one side of zero, i.e. CDF (0)3 above 0.95 (Ahrend, 2012). All these estimation steps can be achieved through the utilisation of the R Project as it provides an excellent flexibility for statistical analysis.

3.3 Data sources

This paper uses cross-country data from 58 developing countries covering the period of 1996-2011[4](see Appendix 1). The dependent variable is R&D intensity which is defined as the ratio of R&D expenditure to GDP. Data was collected from the *United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute of Statistic database*. The human capital (i.e. *I* variable) is proxy for the ratio of the population above 25 having tertiary education and adopted from Barro and Lee (2013).

The variables of interest in the model (i.e. *M* variables) include the two technology transfer channels: import and FDI. The former channel, proxy by the ratio of total import to GDP and its sub-categories (i.e. ratio of manufactured goods imports to GDP and ratio of machinery and equipment import to GDP) were obtained from *United Nations Conference on Trade and Development database* while the latter channel, proxy by ratio of FDI inflow to GDP, was obtained from *World Development Indicators database*.

The *Z* variables consist of several other variables which are hypothesised to influence R&D activity: income, population density, the ratio of the fixed capital formation to GDP and its growth rate, the role of government (i.e. expenditure, imbalancesand spending in R&D) and the indicators of macroeconomics (i.e. inflation and unemployment). All these variables are extracted from the *World Development Indicators database* except government spending in R&D which was obtained from *UNESCO Institute of Statistic database.*

4. Empirical results

The results of EBA with different combinations of independent variables are presented in tables 1 to 4 corresponding to hypothesis 1a to 1d. In each table, columns (1) and (2) respectively present averages of estimated coefficients and standard error overall regressions. Column (3) shows the percentage of regressions in which the respective variable is significant at

least at 5% level. Column (4) reports the p-value of coefficients. CDF (0)s are reported in column (5). Based on Xavier (1997)'s suggestion, a variable is considered robust if 90% confidence interval condition is fulfilled[5] (i.e. CDF(0) is above 0.95) as the variable turn out significant in a very large fraction of the regressions. Finally, column (6) and (7) provides Learmer's lower and upper bounds. In each table, there are four models estimated. In the first model, the whole set of control variables is included. Nonetheless, some of the variables measure similar perspectives of an economy, such as government expenditure and government imbalance; or fixed capital formation and fixed capital formation growth. These variables may be inappropriate to be included in regression together. Therefore, model 2 restricts government expenditure and government imbalance not to appear together in the set of control variables while model 3 restricts the simultaneous presence of fixed capital formation and its growth. Finally, model 4 shows the result when both restrictions are implemented[6].

First of all, human capital is found to be positive and statistically significant in all regressions where p-values for human capital are lower than 0.01 in all regressions. This relationship is found to be robust under Leamer's criterion as shown in Table 1 and 4: positively significant within the range of high value and low value of the coefficient in all regressions. At the same time, results in Tables 2 and 3 also suggest the robustness of this relationship under Xavier's criterion: CDF for human capital is greater than 0.95 in all regressions. These findings are in line with literature which suggests that human capital is a major determinant of domestic innovation effort. This also justifies the inclusion of human capital as *I*-variable in the EBA model.

Table 1 shows the results of using total import as spill over channel. In all four regressions with different restrictions being imposed, no significant relationship is found as both Leamer's and Xavier's criterion does not indicate any robust relationship between total import with R&D intensity. Findings of the present study show that some products included in the total import, such as raw material, do not indicate advanced technology and therefore, restrict the spill over potential. This is similar to Chang et al. (2013) where import is found to have no impact on domestic innovation.

Table 1: Impact of total import on domestic innovation effort

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	**Avg. Beta**	**Avg. SE**	**% Sign.**	**P-value**	**CDF (0)**	**Lower**	**Upper**
Regression one							
HC	0.015	0.004	100	0.0004	99	0.001	0.029
Import	-0.004	0.003	38	0.1888	92	-0.026	0.011

Table 1: (Continue)

Variables	(1) Avg. Beta	(2) Avg. SE	(3) % Sign	(4) % Sign	(5) CDF (0)	(6) Lower	(7) Upper
Regression two							
HC	0.015	0.004	100	0.0004	99	0.001	0.029
Import	-0.004	0.003	39	0.1888	93	-0.026	0.011
Regression three							
HC	0.015	0.004	100	0.0004	99	0.001	0.029
Import	-0.004	0.003	38	0.1888	93	-0.026	0.011
Regression four							
HC	0.015	0.004	100	0.0004	99	0.001	0.029
Import	-0.004	0.003	39	0.1888	93	-0.026	0.011

Notes: Regression one has no restriction in select control variables; regression two restricts that either government expenditure or government imbalance will be included; regression three restricts that either fixed capital formation or fixed capital formation growth will be included in control variables; regression four implements both restrictions.

In order to understand better the impact of import channel, this paper disaggregates the import channel into a narrower channel. Table 2 presents the results of using a narrower definition of import: import of manufactured goods. The Leamer's criterion did not support the existence of a robust relationship but according to Xavier's criterion, import of manufactured goods is found to be robust in three out of four regressions but only significant with positive signs at the 10% level. Overall, there is weak evidence to support a robust relationship between the import of manufactured goods and R&D intensity.

Table 3 shows the result of using the import of machinery and equipment which has higher technological contents as a channel for technology transfer. The Leamer's criterion indicates that there is no robust relationship as lower bounds and upper bounds for this coefficient in all four regressions have different sign. Xavier's criterion, however, suggests that the relationship could be considered as robust where the CDFs in all four regressions are above 95. This suggests that the variable maintain its positive sign at least 95% in all combination estimation, regardless of with or without restriction imposed in the model. The findings provide sufficient evidence to support the robustness of a positive and significant relationship between the import of machinery and equipment and domestic innovation effort in developing countries.

Table 2: Impact of manufactured goods import on domestic innovation effort

Variables	(1) Avg. Beta	(2) Avg. SE	(3) % Sign.	(4) P-value	(5) CDF (0)	(6) Lower	(7) Upper
Regression one							
HC	0.016	0.004	99	0.0002	99	-0.001	0.029
Manu	0.007	0.004	46	0.0855	94	-0.043	0.036
Regression two							
HC	0.016	0.004	99	0.0002	99	-0.001	0.029
Manu	0.008	0.004	46	0.0503	95	-0.043	0.036
Regression three							
HC	0.016	0.004	99	0.0002	99	-0.001	0.029
Manu	0.008	0.004	47	0.0503	95	-0.043	0.036
Regression four							
HC	0.016	0.004	99	0.0002	99	-0.001	0.029
Manu	0.008	0.004	47	0.0503	95	-0.043	0.036

Notes: Regression one has no restriction in select control variables; regression two has restriction that either government expenditure or government imbalance will be included; regression three restricts that either fixed capital formation or fixed capital formation growth will be included in control variables; regression four implements both restrictions.

The findings are in line with Coe et al. (1997) regarding the significance of import of machinery and equipment compared with its alternative. This paper shows that only import of machinery and equipment promote domestic innovation, while Coe et al. (1997) found that it "does a marginally better job" than its alternatives in improving domestic productivity. The role of imported machinery and equipment is mainly due to the fact it contains a greater technological component. Thus, it creates more opportunity for domestic firms to learn from technology transfer. Wang (2010) however, found a negative relationship among developed countries. The difference could be attributable to the technology base of the host countries. Developing countries with a significant technology gap have a greater learning opportunity to learn from foreign technology and thus, willing to invest in innovation activity. In contrast, developed countries would prefer to adopt foreign technology since their learning opportunity is limited and therefore, innovation investment is no longer needed.

Table 3: Impact of machinery and equipment import on domestic innovation effort

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	**Avg. Beta**	**Avg. SE**	**% Sign.**	**P-value**	**CDF(0)**	**Lower**	**Upper**
Regression one							
HC	0.015	0.004	99	0.0004	99	-0.001	0.028
Mac	0.015	0.006	72	0.0153	98	-0.020	0.062
Regression two							
HC	0.015	0.004	99	0.0004	99	-0.001	0.028
Mac	0.015	0.006	71	0.0153	98	-0.020	0.062
Regression three							
HC	0.015	0.004	99	0.0004	99	-0.001	0.028
Mac	0.015	0.006	73	0.0153	99	-0.020	0.062
Regression four							
HC	0.015	0.004	99	0.0004	99	-0.001	0.028
Mac	0.015	0.006	72	0.0153	99	-0.020	0.062

Notes: Regression one has no restriction in select control variables; regression two has restriction that either government expenditure or government imbalance will be included; regression three restricts that either fixed capital formation or fixed capital formation growth will be included in control variables; regression four implements both restrictions.

Finally, this paper looks at alternative technology spill overs channel, namely FDI. The results are presented in Table 4 where both Leamer's and Xavier's criteria do not indicate the presence of any robust relationship between FDI and R&D intensity. The findings are consistent in all four regressions which indicate that domestic innovation of developing countries is not affected by FDI inflows. This is consistent with Chang et al. (2013) and Lu et al. (2017). The insignificant relationship could be due to the absorptive capacity among host countries which enables them to benefit from FDI inflows, e.g. research capacity of the destination (Zhang, 2017) This supports the increasingly popular view that knowledge spill over is not an automatic consequence of MSCs presence but requires host country to have certain level of absorptive capacity in order to benefit from it, e.g. institutional development (Durham, 2004), economic freedom (Azman-Saini, Law, et al., 2010) and financial development (Azman-Saini, Law, et al., 2010), among many others.

In sum, only hypothesis 1c (technology transfer through the import of machinery and equipment exerts no impact on domestic innovation activity) is rejected. The results are very similar to Chang et al. (2013) where import and FDI are both found to be insignificant towards domestic innovation activities. This paper discusses in depth the import channel by disaggregating it. Two of the import channels (total import and import of manufactured goods) are considered in previous studies to have a lower level of technology component than import of machinery and equipment. Thus, the host country's decision in innovating is not affected by these two channels due to their limited spill over effect. A significant effect can, however, be observed with the import of machinery and equipment and its spill over effects. In the meantime, the insignificant impact from the FDI requires further analysis to examine the possible factor, e.g. the role of absorptive capacity. Many studies have found that FDI is less likely to have a direct impact on the host country but certain characteristics within the host country must be present to benefit from it. The inclusion of these factors in the analysis will provide a clearer picture regarding this relationship.

Table 4: Impact of FDI on domestic innovation effort

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	**Avg. Beta**	**Avg. SE**	**% Sign.**	**P-value**	**CDF(0)**	**Lower**	**Upper**
Regression one							
HC	0.015	0.004	100	0.0004	99	0.001	0.028
FDI	-0.009	0.019	2	0.6376	68	-0.081	0.062
Regression two							
HC	0.015	0.004	100	0.0004	99	0.001	0.028
FDI	-0.009	0.019	1	0.6376	68	-0.081	0.062
Regression three							
HC	0.015	0.004	100	0.0004	99	0.001	0.028
FDI	-0.009	0.019	2	0.6376	68	-0.081	0.062

Notes: Regression one has no restriction in select control variables; regression two has restriction that either government expenditure or government imbalance will be included; regression three restricts that either fixed capital formation or fixed capital formation growth will be included in control variables; regression four implements both restrictions.

5. Conclusion

Globalisation process is viewed by many countries (especially the developing ones) as a major source of technology spillovers. Although technology transfer is found to enhance the productivity and growth of host country, its impacts on the other aspects of the economy are however, ambiguous. On one hand, technology transfer complements domestic innovation through improving domestic knowledge base. On the other hand, technology transfer substitutes innovation activity since it is easier to adopt foreign technology than investing in R&D. The studies in this field are, however, very limited as most studies focus on the relationship between technology and economy performance (i.e. productivity and growth). This paper, therefore, aims to fill this gap in knowledge by examining if the technology transfer would influence the economy indirectly, specifically its impact on domestic innovation activity, besides its direct impact on productivity and growth.

The EBA approach is implemented to investigate the impact of import and FDI on domestic innovation activity in 58 developing countries between 1996 and 2011. The FDI inflows and three categories of import-total import, import of manufactured goodsand import of machinery and equipment - are included as the technology transfer channel in the analysis. The findings suggest that though interactions between countries are greater nowadays, only import of machinery and equipment has a positive and significant impact on domestic innovation activities. In other words, the import of machinery and equipment is found to bring more benefits to host country than its alternatives where it promotes domestic innovation activity and productivity as suggested in the literature.

The findings are crucial for policymakers when formulating trade and investment policies. There has to be greater attention to the import of machinery and equipment since it does not only improve the host country's productivity but also promote domestic innovation activities which in turn enhances long-run economic growth. Thus, a proper trade policy that encourages the trade of machinery and equipment does not only provide an opportunity to learn from foreign technology but improves domestic capacity to develop its own technology base.

Though both import and FDI are viewed as significant channel for technology transfer, only the former (specifically import of machinery and equipment) is found to have a significant impact on domestic innovation. It is very likely that lack of sufficient absorptive capacity (e.g. economic freedom, financial development, institutional quality, just to name a few) has led to insignificant direct impact from FDI as suggested by many studies. The study only looks at imports but export is found to influence innovation activities in recent studies. Therefore, the next logical step in

future research is to examine the impact of export on domestic innovation activity.

Notes

1. World Bank data.
2. The share of middle and low-income countries is only 30.7% of world gross expenditure in R&D during 2013 (UNESCO, 2016).
3. Following Xavier (1997), the area under density is divided into two parts which lie on each side of zeroand the larger area is called CDF (0), irrespective of whether it is above or below zero.
4. The sample period is restricted due to data limitation, especially data related to research and development expenditure.
5. The test proposed by Xavier (1997) is basically a one-sided test.
6. These restrictions are imposed in order to address the possible multicollinearity issue since these variables (i.e. government expenditure and government imbalance, fixed capital formation and fixed capital formation growth) tend to strongly correlate with each other.

Acknowledgement

The second author acknowledges financial support from Universiti Putra Malaysia research grants (#GP/2018/9651600 and #GP-IPB/20149440903).

References

Aghion, P. & Howitt, P. (1992). A model of growth through creative destruction. *Econometrica, 60*(2), 323-351.

Aghion, P. & Howitt, P. (1994). Growth and unemployment. *The Review of Economic Studies, 61*(3), 477-494.

Ahrend, R. (2012). Understanding Russian regions' economic performance during periods of decline and growth—an extreme bound analysis approach. *Economic Systems, 36*(3), 426-443.

Azman-Saini, W. N. W., Baharumshah, A. Z. & Law, S. H. (2010). Foreign direct investment, economic freedom and economic growth: international evidence. *Economic Modelling, 27*(5), 1079-1089..

Azman-Saini, W. N. W., Law, S. H. & Ahmad, A. H. (2010). FDI and economic growth: new evidence on the role of financial markets. *Economics Letters, 107*(2), 211-213.

Barro, R. J. & Lee, J. W. (2013). A new data set of educational attainment in the world, 1950–2010. *Journal of Development Economics, 104*, 184-198.

Bean, C. & Pissarides, C. (1993). Unemployment, consumption and growth. *European Economic Review, 37*(4), 837-854.

Bebczuk, R. N. (2002). R&D expenditure and the role of government around the world. *Estudios de economia, 29*(1), 109-121.

Borchert, I. & Yotov, Y. V. (2017). Distance, globalization and international trade. *Economics Letters, 153*, 32-38.

Braconier, H. (2000). Do higher per capita incomes lead to more r&d expenditure? *Review of Development Economics, 4*(3), 244-257.

Chang, C.-L., Chen, S.-P. & McAleer, M. (2013). Globalization and knowledge spillover: international direct investment, exports and patents. *Economics of Innovation and New Technology, 22*(4), 329-352.

Cheung, K.-y. & Lin, P. (2004). Spillover effects of FDI on innovation in China: evidence from the provincial data. *China Economic Review, 15*(1), 25-44.

Coe, D. T. & Helpman, E. (1995). International R&D spillovers. *European Economic Review, 39*(5), 859-887.

Coe, D. T., Helpman, E. & Hoffmaister, A. W. (1997). North-south r & d spillovers. *The Economic Journal, 107*(440), 134-149.

Coe, D. T., Helpman, E. & Hoffmaister, A. W. (2009). International r&d spillovers and institutions. *European Economic Review, 53*(7), 723-741.

Cumming, D. J. & Macintosh, J. G. (2000). The determinants of r&d expenditures: a study of the canadian biotechnology industry. *Review of Industrial Organization, 17*(4), 357-370.

Dreher, A., Sturm, J.-E. & Haan, J. d. (2010). When is a central bank governor replaced? evidence based on a new data set. *Journal of Macroeconomics, 32*(3), 766-781.

Durham, J. B. (2004). Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth. *European Economic Review, 48*(2), 285-306.

Fabre, G. (2014). 1 - The real leap forward: China's r&d and innovation strategy a2 - Taylor, Robert *The Globalization of Chinese Business* (pp. 3-25). Oxford: Chandos Publishing.

Furman, J. L., Porter, M. E. & Stern, S. (2002). The determinants of national innovative capacity. *Research Policy, 31*(6), 899-933.

Gorg, H. & Greenaway, D. (2004). Much ado about nothing? do domestic firms really benefit from foreign direct investment? *The World Bank Research Observer, 19*(2), 171-197.

Hu, M.-C. & Mathews, J. A. (2005). National innovative capacity in east asia. *Research Policy, 34*(9), 1322-1349.

Jha, S. K. & Krishnan, R. T. (2013). Local innovation: the key to globalisation. *IIMB Management Review, 25*(4), 249-256.

Leamer, E. E. (1983). Let's take the con out of econometrics. *The American Economic Review, 73*(1), 31-43.

Linnemann, L. & Schabert, A. (2004). Can fiscal spending stimulate private consumption? *Economics Letters, 82*(2), 173-179.

Lu, Y., Tao, Z. & Zhu, L. (2017). Identifying fdi spillovers. *Journal of International Economics, 107*, 75-90.

Potterie, B. v. P. d. l. & Lichtenberg, F. (2001). Does foreign direct investment transfer technology across borders? *The Review of Economics and Statistics, 83*(3), 490-497. h

Pueyo, A., García, R., Mendiluce, M. & Morales, D. (2011). The role of technology transfer for the development of a local wind component industry in Chile. *Energy Policy, 39*(7), 4274-4283.

Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy, 98*(5), S71-S102.

Tee, C. L., Azman-Saini, W. N. W., Ibrahim, S. & Ismail, N. W. (2015). R&D spillovers and the role of economic freedom. *International of Economics and Management, 9*(S), 41-60.

Teitel, S. (1987). Science and technology indicators, country size and economic development: An international comparison. *World Development, 15*(9), 1225-1235.

Teitel, S. (1994). Patents, R & D expenditures, country size and per-capita income: An international comparison. *Scientometrics, 29*(1), 137-159.

Un, C. A. & Cuervo-Cazurra, A. (2008). Do subsidiaries of foreign mnes invest more in r&d than domestic firms? *Research Policy, 37*(10), 1812-1828.

UNCTAD. (2016). World investment report 2016:investor nationality: policy challenges. Retrieved from http://unctad.org/en/PublicationsLibrary/wir2016_ en.pdf.

UNESCO. (2016). *UNESCO science report: towards 2030*. Retrieved from http://unesdoc.unesco.org/images/0023/002354/235406e.pdf.

Veugelers, R. & Houte, P. V. (1990). Domestic R&D in the presence of multinational enterprises. *International Journal of Industrial Organization, 8*(1), 1-15.

Wang, E. C. (2010). Determinants of r&d investment: the extreme-bounds-analysis approach applied to 26 OECD countries. *Research Policy, 39*(1), 103-116.

Xavier, X. S.-I. M. (1997). I just ran two million regressions. *The American Economic Review, 87*(2), 178-183.

Zhang, L. (2017). The knowledge spillover effects of FDI on the productivity and efficiency of research activities in China. *China Economic Review, 42*, 1-14.

Appendices

Appendix 1: List of Countries

Algeria	Iran (Islamic Republic of)	Poland
Argentina	Iraq	Romania
Armenia	Kazakhstan	Russian Federation
Azerbaijan	Kyrgyzstan	Saudi Arabia
Belarus	Latvia	Serbia
Bolivia (Plurinational State of)	Lesotho	Seychelles
Bosnia and Herzegovina	Lithuania	South Africa
Bulgaria	Macedonia, The former Yugoslav Republic of	Sri Lanka
Burkina Faso	Madagascar	Sudan
Burundi	Malaysia	Tajikistan
China	Mauritius	Thailand
Colombia	Mexico	Trinidad and Tobago
Costa Rica	Mongolia	Tunisia
Croatia	Montenegro	Turkey
Democratic Republic of the Congo	Morocco	Uganda
Ecuador	Myanmar	Ukraine
Egypt	Pakistan	Uruguay
Georgia	Panama	Zambia
Guatemala	Paraguay	
Hungary	Peru	

Institutions and Economies
Vol. 10, No. 4, October 2018, pp. 21- 48

Financial Knowledge, Attitude and Behaviour of Young Working Adults in Malaysia

Chen-Chen Yong[a], Siew-Yong Yew[b], Chu-Kok Wee[c]

Abstract: *A conceptual model was proposed based on the theory of planned behaviour to examine the relationship between financial knowledge, attitude, behaviour and financial literacy among young working adults in Malaysia. Perceiving financial literacy as a developmental process which includes knowledge and application dimensions, the proposed model was tested on a sample of 1915 young working adults from Klang Valley, Malaysia. Data was analysed using structural equation modelling (SEM). Results indicated financial education positively influenced financial knowledge which in turn, significantly predicted both financial attitude and behaviour. Attitude partially mediated the effect of knowledge on behaviour. Analysis revealed that in terms of financial attitude, "future and non-impulsiveness" was significant while in financial behaviour, "expenditure monitoring and saving behaviour" was critical. In terms of ethnic background, the Chinese possessed the highest financial knowledge and behaviour while Indians possessed the highest financial attitude. No gender difference was noted on any relationships. Initiatives and interventions on making financial education accessible as well as gradual change of attitude are recommended for immediate actions.*

Keywords: Financial attitude and financial literacy, behaviour, knowledge, theory of planned behaviour
JEL classification: I22, G41, I22

Article received: 25 November 2017; Article accepted: 21 August 2018

1. Introduction

Millennials are trapped in a digital life style which contributes to their financial burdens (Asian Institute of Finance, 2015). Changing consumer patterns and easy access to personal debt facilities results in youths ending up in bankruptcy as they lose control over their finances. Among young Malaysians, a paucity of financial knowledge has been documented

[a] Corresponding author. Faculty of Economic and Administration, University Malaya, 50603 Kuala Lumpur, Malaysia. *Email: ccyong@um.edu.my*
[b] Faculty of Economic and Administration, University Malaya, 50603 Kuala Lumpur, Malaysia. *Email: ysiewyong@yahoo.com*
[c] Faculty of Accountancy, Finance and Business, Tunku Abdul Rahman University College, Jalan Genting Kelang, 53300, Setapak, Kuala Lumpur, Malaysia. *Email: weeck@tarc.edu.my*

obvious despite government and private sector efforts (Jay, 2017). Malaysians are incapable of making responsible financial decisions for their own financial well-being (Tang Ruxyn, 2017). According to a 2015 report, 76% of Malaysians were not able to raise at least RM1000 in an emergency situation (Financial Stability and Payment Systems Report, 2015). Majority of youths depend on high cost borrowings, personal loans and credit card borrowings (Asian Institute of Finance, 2015). Despite increasing life expectancy in Malaysia, only 40% are financially ready for their retirement (Financial Stability and Payment Systems Report, 2015). Additionally, Malaysians are vulnerable to financial frauds and scams due to their poor financial management practices (Tang Ruxyn, 2017).

The issues surrounding lack of financial literacy among Malaysians has been empirically studied looking at medical practitioners (Anthony & Sabri, 2015), randomly selected adults (Folk, Beh & Baranovich, 2012; Mahdzan & Tabiani, 2013), public sector female employees (Sabri & Juen, 2014) and undergraduate students (Yew, Yong, Cheong & Tey, 2017). The focus was on the level of financial knowledge (Anthony & Sabri, 2015), effect of financial literacy on individual savings (Mahdzan & Tabiani, 2013), demographics and personal financial wellbeing measures (Folk et al., 2012), socio economic characteristics on individual financial knowledge (Loke, 2015) and impact of financial socialisation factors and gender differences (Yew et al., 2017). Anthony and Sabri (2015) pointed out medical practitioners lack financial knowledge and guidance while Mahdzan and Tabiani (2013) found that financial literacy significantly influences individual savings. However, these studies concluded that overall, financial literacy among Malaysians is lower compared with rest of the world and with differences among ethnic groups and gender. Yew et al. (2017) examined the association between attitude and behaviour focusing on financial education and gender. They recommended financial education should be strengthened in schools and universities. However, earlier studies had shown that higher financial education does not necessarily guarantee a responsible financial behaviour (Lusardi & Mitchell, 2011) and even within Malaysia, people with higher financial knowledge experience financial difficulties (Loke, 2015). This shows financial literacy has not yet been fully studied or understood.

It is important to understand how an individual develops an ability to make correct financial decisions (Hung, Parker & Yoong, September 2, 2009). Incorporating financial knowledge, attitude and behaviour together in a model will generate a comprehensive understanding on the topic (Serido, Shim & Tang, 2013). While acknowledging the challenge of creating a multidisciplinary measure, Potrich, Vieira and Mendes-Da-Silva (2016) emphasised the need for various measures to enhance financial literacy that targets minimum financial knowledge, attitude and behaviour.

It is clear financial literacy has not been studied as a developmental process, except for financial behaviour (Serido et al., 2013). Therefore, a comprehensive analysis is vital in order to understand the causal relationship between knowledge, attitude and behaviour in a financial literacy model which is the primary objective of the current study.

Studies on financial literacy mainly use econometrics analysis. However, the current study uses a novel approach to examine financial literacy in a broad context. Based on the theory of planned behaviour (TPB), the current study contributes to existing literature by investigating how financial literacy is developed through the interaction of behavioural components of individuals, such as financial education, knowledge, attitude and behaviour using a sample of young working adults in Malaysia. Stolper and Walter (2017) pointed out financial decisions of citizens are different based on their geographical locations. This will help relevant authorities to develop and implement context-specific strategies.

2. Literature Review

2.1 Understanding financial literacy

Studies have documented individuals and families with higher financial literacy have an advantage (Conger, Conger, Matthews & Elder, 1999; Schmeiser & Seligman, 2013) higher wealth accumulation as they buy shares at the stock markets and engage in active savings (Agarwal, Amromin, Ben-David, Chomsisengphet & Evanoff, 2010; Gathergood & Disney, 2011).

According to Huston (2010), definition of financial literacy has evolved from merely being knowledgeable on financial matters to the ability to make use of such literacy on day to day financial decisions. However, the terms financial literacy, knowledge and financial education have been used interchangeably in the literature. For instance, Fernandes, Lynch Jr and Netemeyer (2014) used financial literacy and financial knowledge interchangeably. Huston (2010); Potrich et al. (2016) argued both these terms are conceptually different and warned future researchers the dangers of using them interchangeably. Huston (2010, p. 306) defined financial literacy as "measuring how well an individual can understand and use personal finance-related information". Hung et al. (September 2, 2009) agreed with this definition adding that financial literacy consists of knowledge, attitude, behaviour and ability to make financial decisions. Financial literacy is centred on individuals and focuses on the inputs that shape individual behaviour (Lusardi, 2012).

Huston (2010) elaborated that financial literacy has two dimensions: 'understanding' and 'use'. Financial knowledge belongs to 'understanding' while application of such knowledge is the 'use'. The knowledge that shapes financial decision-making is what constitutes financial literacy, which consists of dimensions of understanding and use (Huston, 2010). In essence, a financially literate person has the confidence and ability to use such knowledge (Huston, 2010) and to make personal financial decisions (Lusardi & Mitchell, 2014).

There is an ongoing debate on the importance of financial capability and financial literacy. For instance, Johnson and Sherraden (2007) emphasised on the importance of financial capability over literacy, while Lusardi (2012), Lusardi and Mitchell (2014) argued on the applicability and usefulness of financial literacy over financial capability. The concept of financial capability has been criticised for dictating the best behavioural guideline that is applicable to all. Instead, financial literacy acknowledges that individuals are unique in their own ways and are responsible for their own decisions. Therefore, studies on financial literacy emphasise on the need for empowering individuals than dictating one's best financial behavioural that is applicable to everyone.

2.2 A behavioural perspective to understand financial literacy

There are many inconsistencies in conceptualising and defining financial literacy (Ex: Huston 2010). Many empirical studies are inspired by life-cycle model of consumption and saving (Modigliani & Brumberg, 1954) and consumption function (Friedman, 1957). Thereafter, theoretical modelling has developed from two-period model of saving and portfolio allocation (Willis, 2008) to multi-period life cycle model (Jappelli & Padula, 2013). As Jappelli and Padula (2013) theorised, a person along with his financial literacy level will acquire more wealth over a life cycle period. Lusardi (2012) stressed upon the need to study financial literacy with focus on the input that shapes the behaviour. On the other hand, the financial literacy model suggested by Willis (2008) is based on the argument that depending on the return on the effort, an individual then decides to acquire financial knowledge. Hence, the current study investigates the applicability of TPB (Theory of Planned Behaviour) to understand financial literacy process from a behavioural perspective. There are few studies which are based on behavioural approach to financial literacy, such as Bruine deBruine et al., 2007; Parker & Fischoff, 2005; Finucane et al., 2005; Levin et al. 2007; cited by (Hung et al., September 2, 2009; Serido et al., 2013). Those were conceptualised as a developmental process rooted on the cognitive development theory and social cognitive theory.

However, the TPB is the most suitable theory related to financial behaviour as it predicts and understands human behaviour (Xiao, 2008) and it explains an individual's intention to perform given an accepted behaviour (Ajzen, 1991). It has been widely used across different disciplines and research related to family planning, weight loss, voting, alcoholism (Ajzen, Fishbein & Fishbein, 1980), credit counselling and investment decisions, mortgage (Xiao, 2008). The theory has been well supported by these studies (Ajzen, 1991; Armitage & Conner, 2001). As per TPB, a person's behaviour which is determined by attitude, subjective norm and the perceived control, is backed by his behavioural intention (Ajzen, 1991). According to Xiao (2008), based on TPB, a person will show an attitude on a future behaviour based on an evaluation of such a behaviour which is determined by the perception on the outcome of such behaviour. As Xiao (2008) explains, TPB emphasises on the factors of an individual's actual behavioural choices. In short, a person will always assess the outcomes of his or her behaviour and that assessment shapes the person's attitude.

In order to examine financial literacy based on a behavioural approach, it is important to understand how TPB can explain an individual's behaviour. The TPB posits intention is the best predictor of a behaviour which in turn is determined by attitude and social normative perception towards the behaviour (Montano & Kasprzyk, 2015). As per the explanation given by Montano and Kasprzyk (2015), TPB posits a perceived control over a behaviour which is an evolution to the theory of reasoned action (TRA). Financial decision making and managing personal finances are personal choices based on what individuals' experience and are exposed to. As financial literacy is defined as a person's confidence and ability to use financial knowledge (Huston, 2010) and to make personal financial decisions (Lusardi & Mitchell, 2014) which he or she has a perceived control over, TPB can be used to understand how financial literacy process works. Further, Lusardi (2012), Lusardi and Mitchell (2014) argued in favour of financial literacy over financial capability, whereby the former is based on the fact individuals are unique and responsible for their own financial decisions. Therefore, financial literacy acknowledges the perceived control of an individual in his or her financial decisions and choices. An individual will not show an accepted financial behaviour unless the value of such behaviour is being perceived by the person, which is subject to his attitude and in which he has a control over.

Hence, it can be argued that even if a person possesses financial knowledge, the actual financial behaviour will be decided by the person's attitude which is the foundation for the proposed model in the current study.

3. Methodology

3.1 Data collection

The population of this study are young Malaysian working adults residing in Klang Valley, Malaysia. The sample was selected from young working adults visiting shopping malls in Klang Valley. Based on the National Youth Policy in Malaysia, individuals between ages of 18 and 40 are defined as youths. A non-probabilistic sampling technique, namely convenient and quota sampling, was used to collect data.

The five regions of Klang Valley: Northern, Eastern, Southern, Western Klang Valley and Central Kuala Lumpur were selected based on the size of the population. A total of 80 shopping malls was selected based on data from Malaysia Shopping Malls (PPK). Targeting 50 respondents from each shopping mall, a total of 4000 customers were expected to visit the malls. The employees worked in those shopping malls and customers who do not manage their own finances due to mental incapacity were excluded. As shown in Appendix 1, the sample comprises main ethnic groups in Malaysia. Questionnaires were distributed at the selected shopping malls from 1st January 2017 until 15th April 2017 with a total number of 1915 useable questionnaires with the response rate of 47.88%.

3.2 Instrument and measurement

A set of questionnaires was prepared in Bahasa Melayu, Chinese and English to collect data. A pre-study with the help of experts was conducted to ensure the validity of the questionnaires followed by a pilot study with 40 respondents.

Financial education measures were adapted from Australia and New Zealand Banking Group Limited (ANZ) (2015) and has two perspectives: individuals' "financial background" and "exposure/experience to financial education programs, sessions and opportunities." The financial background was assessed in terms of influence of friends and families and exposure to financial education was assessed in terms of attending seminars, workshops and consulting financial planners or counsellors. Responses were analysed on a five-point Likert type scale ranging from 'never' to 'very often'. The instrument items for financial knowledge were adapted from Zottel, Perotti and Bolaji-Adio (2013). Respondents were asked to answer eight multiple choice questions to measure their actual financial knowledge. These included questions on their knowledge on division, inflation and impact of inflation, interest rate, interest on loan, compound interest, financial risk and investment diversification. Respondents' financial knowledge scores were obtained after summing up all the correct answers. The financial

attitude were adapted from Atkinson and Messy (2012); Australia and New Zealand Banking Group Limited (ANZ) (2015); Bolaji-Adio, Iarossi, Perotti and Zottel (2013); Zottel et al. (2013). It included 10 items measured on a five-point Likert type scale ranging from 'Strongly Disagree' to 'Strongly Agree' which measured two perspectives, namely attitude towards the "future, non-impulsiveness" and attitude towards the "achievement orientation". Financial behaviour was measured based on a 15 - item scale adapted from Kempson, Perotti and Scott (2013); World Bank (2013); Yoong, Mihaly, Bauhoff, Rabinovich and Hung (2013), measured on a five point Likert type scale. It included behaviour related to budgeting, over spending, expense monitoring and saving, planning for old age and unexpected expenses. As for financial literacy, the five scale items were adapted from Kempson et al. (2013); World Bank (2013); Yoong et al. (2013) to assess financial literacy related to proper financial management practices and decisions.

3.3 Framework and techniques of analysis

3.3.1 Research framework

The proposed conceptual model consists of two dimensions of financial literacy: knowledge and application. Perceiving financial literacy as a process, the input, throughput and output are conceptualised. It presumes two alternative paths to financial literacy. Therefore, it goes beyond the knowledge dimension up to the application dimension as suggested by Huston (2010). It is proposed that an individual's financial knowledge is a result of financial education which leads to an acceptable financial behaviour. The first path presumes it to occur through the changed attitude due to improved financial knowledge and the second path is a direct path where it is hypothesised the increased knowledge will generate an immediate change in behaviour. The proposed research framework is shown in Figure 1.

The proposition in the proposed model is, when individuals' knowledge on financial matters increase, it will empower them through a positive change in attitude towards finance. This ultimately can produce accepted financial behaviours. Borden, Lee, Serido and Collins (2008); Jorgensen and Savla (2010) Shim (2010) noted financial knowledge and financial attitude are associated with each other and Jorgensen and Savla (2010); Serido et al. (2013) revealed that attitude acts as a mediator between financial knowledge and behaviour. Hayhoe, Leach, Allen and Edwards (2005) found a correlation between financial knowledge and attitude while no such correlation was found by Potrich et al. (2016).

3.3.2 Financial education, financial knowledge and financial literacy

Potrich et al. (2016) defined financial education as a development process in order to facilitate people to make correct decisions and thereby successfully manage personal finance, while financial literacy refers to how such knowledge and abilities are used. This definition clearly differentiates between financial education, knowledge and literacy. Financial education is always related to personal exposure and experience. Most individuals cite their personal experience as the most important source of their financial learning (Hilgert, Hogarth & Beverly, 2003). One of the most important roles of financial education is to act as a preventive measure to manage debt (Anderloni & Vandone, 2011).

Regarding financial knowledge acquisition, Willis (2008) argued an individual will always compare the cost and return when acquiring financial knowledge. In Malaysia, the level of education, type of profession and government pensions scheme have significantly impacted the financial knowledge of working adults (Loke, 2015). However, according to Hung et al. (September 2, 2009) the financial behaviour and the ability of an individual is influenced by his financial knowledge and confidence which may not be correlated to actual knowledge. Therefore, there is a difference between actual and perceived financial knowledge of an individual. Hence, Huston (2010) emphasised a knowledge gap due to the difference between perceived and actual financial knowledge which may hinder good personal financial management practices.

No solid evidence was found on the relationship between financial education and individual performance on financial literacy tests. For example, Folk et al. (2012) studied the relationship between financial learning and individuals retirement planning preparation and found a mediating effect between financial learning and personal financial planning among the older age groups. Jump$tart Survey (Mandell, 2008) shows a linkage between financial education and high school students' financial knowledge levels though not significant. Further Mandell and Klein (2009) and Peng, Bartholomae, Fox and Cravener (2007) found financial education has no significant impact on knowledge.

However, Meier and Sprenger (2013) pointed out that participation in financial educational programmes resulted in more forward-looking behaviours among the respondents. Carpena, Cole, Shapiro and Zia (2011) also found that financial education did impact and improve financial awareness among youths in India, although this may not necessarily improve their financial decisions. Folk et al. (2012) found financial education helps an individual to be updated on latest financial knowledge and which in turn impacts positively on financial satisfaction. Similarly,

Batty (2015); Bruhn, de Souza Leão, Legovini, Marchetti and Zia (2013); Danes, Huddleston-Casas and Boyce (1999); Go, Varcoe, Eng, Pho and Choi (2012) reported knowledge gains after implementation of financial educational programmes. Recently, Fernandes et al. (2014), using the term intervention to refer to the financial education and other forms of exposures, showed good effects of financial education on financial literacy. Therefore, the following hypotheses are proposed:

> Hypothesis 1: *Financial education positively influences financial knowledge*

3.3.3 Financial knowledge and financial behaviour

Recently, literature has focused on showing the relationship between financial knowledge and behaviour (Jappelli & Padula, 2013; Lusardi, Michaud & Mitchell, 2013; Willis, 2008). However, the relationship between financial knowledge and financial behaviour has not always been proven a causal relationship and as Hastings, Madrian and Skimmyhorn 2012 stated, cited by Batty (2015), such a relationship is not necessarily implied. For instance, Bir (2016) suggested financial knowledge was not significant in predicting financial management practices.

Hogarth and Beverly, (2003) cited by Serido et al. (2013) on the other hand showed a positive association between financial knowledge and behaviour. Similarly, Serido et al. (2013) pointed to a significant effect of financial knowledge on financial behaviour concluding that if knowledge on financial matters are internalised, it can result in an accepted financial behaviour. Similarly, recent studies revealed higher financial knowledge resulted in higher standard of financial behaviour (Hilgert et al., 2003; Loke, 2015; Potrich et al., 2016; Servon & Kaestner, 2008). Therefore, the following is developed:

> Hypothesis 2: *People with higher financial knowledge have strong financial behaviour*

3.3.4 Role of financial attitude in financial literacy

Lusardi (2012) explains with examples that apart from the financial education and the knowledge level of an individual, the final decisions and behaviours of individuals are shaped by their personal preferences and economic circumstances. The TPB posits that the behavioural intention is determined by attitude and the social normative perception towards that behaviour (Montano & Kasprzyk, 2015) and attitude has been identified as an important mediating variable in financial literacy.

In the context of finance, attitude refers to the psychological tendency to decide what is best and second best after considering the good and the bad when making a particular investment decision which in other words, endorses some behaviour (Eagly & Chaiken, 1993). An individual's financial behaviour is mostly visible if the knowledge on financial matters have been internalised (Serido et al., 2013). Such internalisation can be captured and better explained through a financial attitude component in a model. Financial attitudes and intrinsic behaviour also matter in financial literacy (Loke, 2015). Only a few studies considered the effect of financial attitude on financial practices and behaviours. For instance, Agarwalla, Barua, Jacob and Varma (2015); Atkinson and Messy (2012); Potrich et al. (2016); Shockey (2002) considered knowledge, attitude and behaviour as components of financial literacy. It is evident financial behaviour can be changed with better financial knowledge and attitude (Hayhoe et al., 2005) and in turn, positive financial attitude results in better financial management practices (Bir, 2016). Further, Bir (2016) concluded it is financial attitude that has greater influence on financial knowledge in financial management practices among fresh graduates. Serido et al. (2013) found subjective financial knowledge is significantly associated with financial attitude in the context of financial self-belief.

3.3.5 Financial behaviour

Financial behaviour is a major determinant of financial literacy (Fernandes et al., 2014; Lusardi & Mitchell, 2014; Potrich et al., 2016) and financial knowledge and attitude precedes financial behaviour (Hayhoe et al., 2005; Potrich et al., 2016). A longitudinal study provides clear evidence that financial knowledge affects self-belief about finance (which includes financial attitude) which in turn influences financial behaviour and finally affects financial and overall well-being of an individual (Serido et al., 2013). The relationship between financial attitude and financial behaviour can be understood in the studies related to credit card holders. This studies noted a positive association between attitude and behaviour of credit card holders (Chien & Devaney, 2001; Danes & Hira, 1990; Rutherford & DeVaney, 2009). Experimental studies supported the notion financial knowledge via financial education programmes influences financial attitude which has an impact on financial behaviour. For example, it was found that students who received financial education had improved financial attitude and a year later had an improvement in financial behaviour compared with the control group (Batty, 2015). Therefore, the following are developed:

> Hypothesis 3: *Financial attitude mediates the relationship between financial knowledge and financial behaviour*

Hypothesis 4: *Financial behaviour positively influences financial literacy*

3.4 Technique of analysis

Data was analysed using Partial Least Square (PLS) structural equation modelling (SEM) A statistical approach, PLS, is used in modelling comprehensive multivariable relationships among observed and latent variables which allows examining of causal relationships between variables (Vinzi, Chin, Henseler& Wang, 2010).

3.5 Evaluation of the measurement model

3.5.1 Reliability and validity

Financial education explained 64.16% of the variance with factor loadings between 0.642 and 0.865. Financial knowledge explained 55.41% of the variance. Financial behaviour explained 59.25% with factor loadings between 0.437 and 0.858. Financial attitude had factor loadings between 0.582 and 0.822 which explained 57.97% of variance. Financial literacy explained a variance of 59.39%.

Cronbach's Alpha values assess the internal consistency reliability. Financial knowledge, attitude, behaviour and literacy had alpha values 1, 0.792, 0.791 and 0.811 respectively while for financial education it was 0.644. However, according to Hinton, McMurray and Brownlow (2004), an alpha value higher than 0.5 is moderate and acceptable. Table 1 shows the composite reliability (CR) exceeded the acceptable level of 0.7 (Hair Jr, Anderson, Tatham& Black, 1998) for all constructs and thereby, reliability was established.

Outer loadings and average variance extracted (AVE) were assessed in order to conclude on convergent validity. Factor loading threshold was kept at 0.5 as minimum of 0.5 is acceptable when items in the construct have greater alpha values (Barclay, Higgins& Thompson, 1995; Chin, 1998). The cut off for AVE is 0.5 (Fornell & Larcker, 1981). However, this was not achieved for financial attitude and behaviour (see Table 1). Acknowledging that attitude and behaviour are complex and difficult to measure, the emphasis placed on CR is much higher than AVE and it is recommended to continue measuring the model with lower AVEs provided that CR is higher than 0.60 (Fornell & Larcker, 1981). As mentioned above, CR exceeded 0.7.

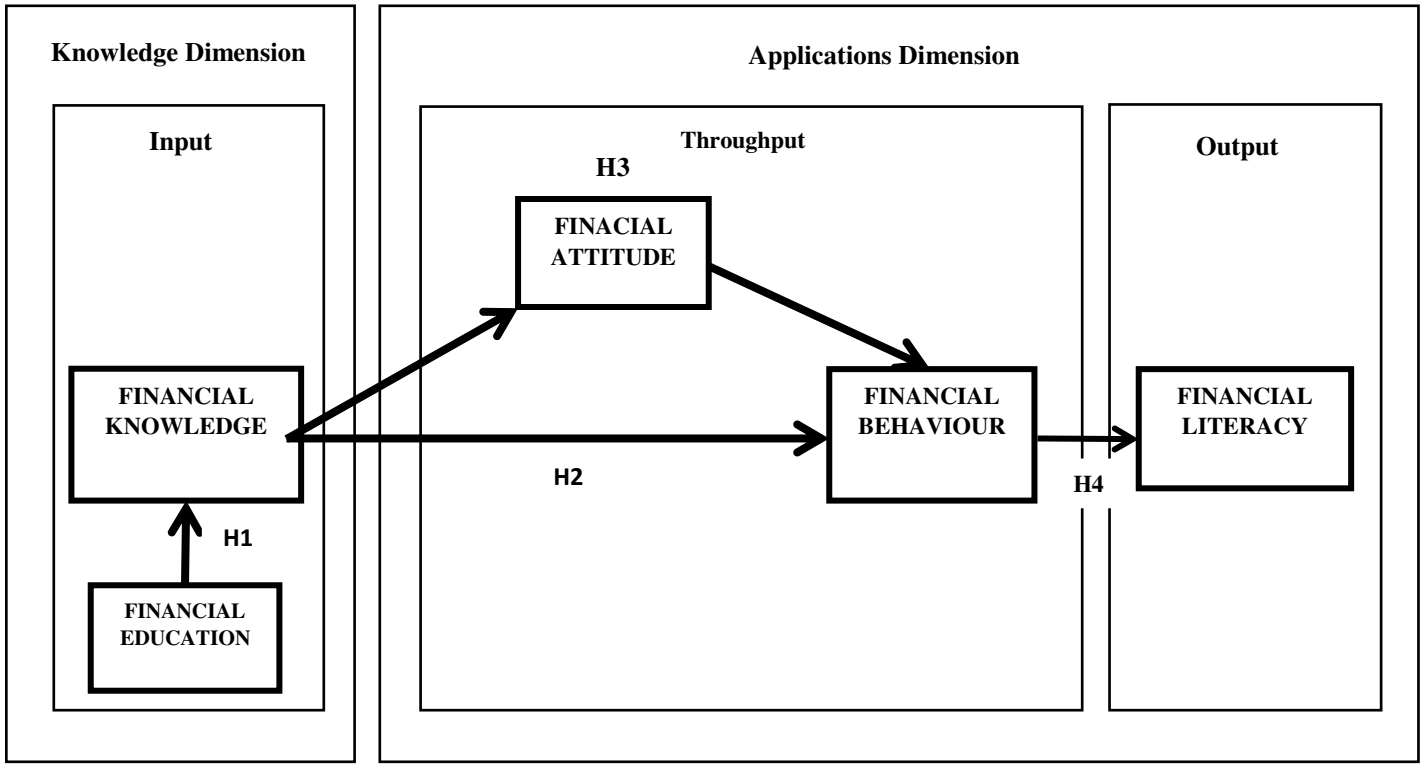


Figure 1: Research Framework

In Appendix 2, 3, 4 and 5, the discriminant validity was established based on Fornell-Larcker criterion coefficients and Hetrotrai-Monotrait Ration (HTMT), cross loadings and outer VIF values.

Table 1: Confirmatory Factor Analysis

Latent Constructs	Items	Loadings	Composite Reliability	AVE
Financial Attitude	FA1	0.581	0.848	0.446
	FA2	0.767		
	FA3	0.525		
	FA4	0.708		
	FA5	0.663		
	FA6	0.708		
	FA7	0.692		
Financial Behaviour	FB1	0.588	0.837	0.367
	FB2	0.563		
	FB3	0.618		
	FB4	0.732		
	FB5	0.557		
	FB6	0.546		
	FB7	0.574		
	FB8	0.547		
	FB9	0.693		
Financial Education	FE1	0.599	0.792	0.668
	FE2	0.989		
Financial Knowledge	FK	1.000	1.000	1.000
Financial Literacy	FL1	0.765	0.869	0.623
	FL2	0.81		
	FL3	0.752		
	FL4	0.829		

In order to assess common method variance (CMV), inner VIF values were observed. Any factor level inner VIF value greater than 3.3 was considered as a signal of CMV biasness (Kock, 2015). Referring to Appendix 4, as inner VIF values are less than 3.3, the measurement model is free from CMV biasness. Blindfolding procedure was used to assess the predictive relevance of the model. The cross validated redundancy statistics in Table 2 depict the model is capable of predicting the population as Q2 > 0 (Chin, 1998). The omission distance was set at 7.

Table 3.1: Construct Cross Validated Redundancy

Construct	SSO	SSE	Q^2 (=1-SSE/SSO)
Financial Attitude	13,405.000	12,943.446	0.034
Financial Behaviour	17,235.000	16,427.823	0.047
Financial Knowledge	1,915.000	1,882.641	0.017
Financial Literacy	7,660.000	7,644.714	0.002

4. *Analysis and Results*

4.1 Profile of the respondents

Majority of the respondents were Malays (57.2%) followed by 31.5% Chinese and the rest of Indians which are consistent with national population statistics (Appendix 1). In terms of gender, 58% were women while more than 55% of the respondents were aged between 21 and 30 years. Majority were managers and professionals accounting for 22.1% of the respondents followed by technicians (Appendix 6).

4.2 Evaluation of the structural model

After a bootstrapping of 5000 samples, the hypotheses were tested for their significance. Financial education is a significant predictor of financial knowledge ($t= 5.844$, $p<0.05$) whereby H1 was supported. Financial knowledge was found to be significantly and positively related to financial behaviour ($t= 5.906$, $p<0.05$) whereby H2 was supported too. However, it was found that financial behaviour was significantly and negatively related to financial literacy ($t= 3.268$, $p<0.05$) whereby H4 was not supported. Results are shown in Figure 2.

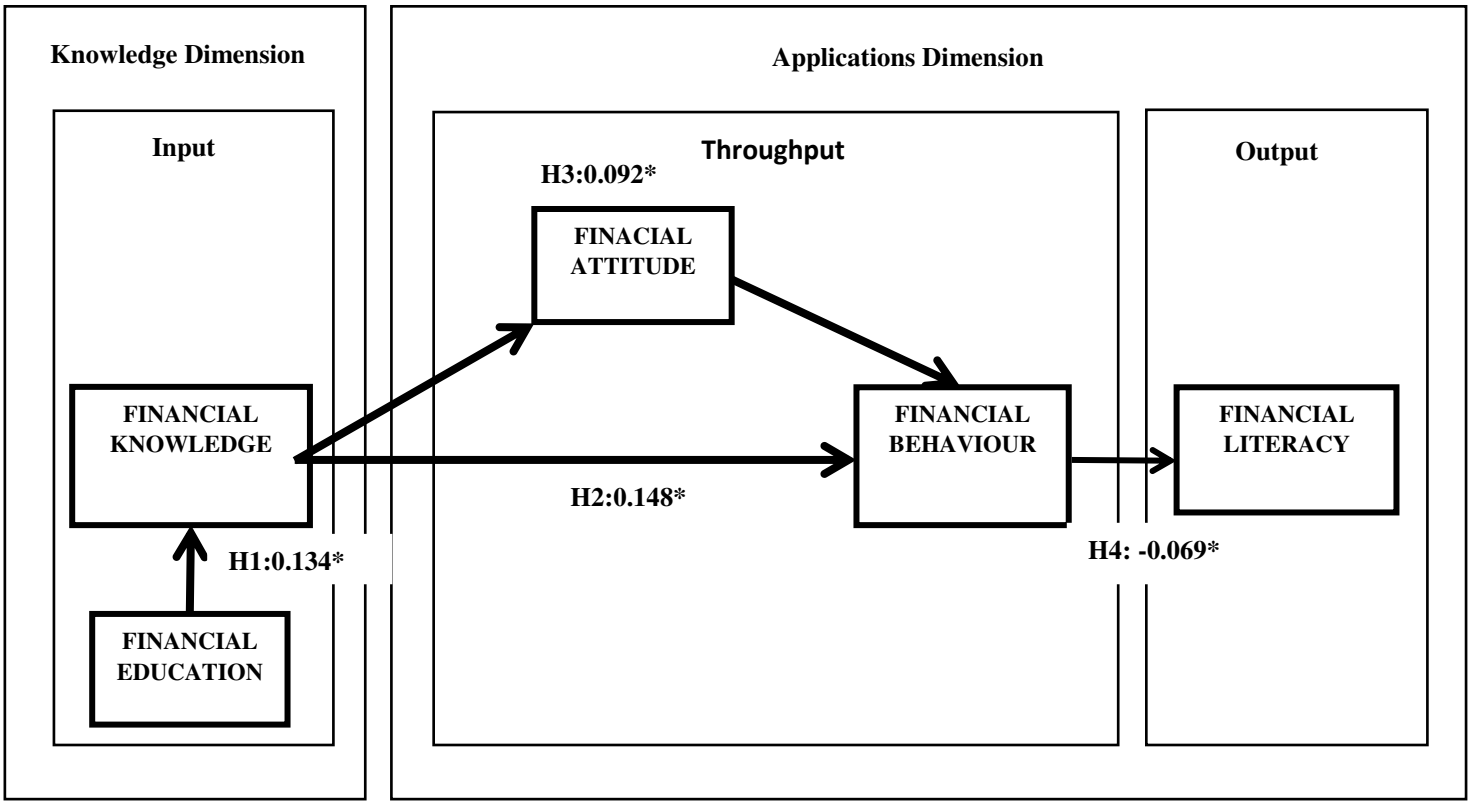


Figure 2: Conceptual Model

Note: *p<0.05.

4.3 Testing the mediating of financial attitude

Before testing the mediating effect of financial attitude on the relationship between financial knowledge and behaviour, their direct relationships were investigated. As Baron and Kenny (1986) explained, a mediation is predicted when there is a strong relationship between the independent variable and the dependent variable. As shown in Table 3, the direct relationship between financial knowledge and behaviour is significant (t= 5.906, p<0.05). Further, the attitude's relationships with financial knowledge (t=12.921, p<0.05) and behaviour (t=12.792, p<0.05) are significant too, qualifying to test for a mediation. As depicted in Table 4, as both direct effect and indirect effect are significant, it was concluded that financial attitude partially mediates the relationship between financial knowledge and behaviour. In order to confirm its partial mediation, variance accounted for (VAF= Indirect Effect/Total Effect) was calculated. The VAF was 38% (0.092/0.240) confirming it as a partial mediation as a VAF between 20% -80% is a partial mediation (Hair Jr, Hult, Ringle& Sarstedt, 2016).

Table 3: Hypotheses Testing Results

Paths	**Beta**	**SE**	***t***	***p* -values**
Financial Attitude -> Financial Behaviour	0.319	0.025	12.792	0. 000
Financial Behaviour -> Financial Literacy	-0.069	0.021	3.268	0. 001
Financial Education -> Financial Knowledge	0.134	0.023	5.844	0. 000
Financial Knowledge -> Financial Attitude	0.289	0.022	12.921	0. 000
Financial Knowledge -> Financial Behaviour	0.148	0.025	5.906	0. 000

Table 4: Mediation Analysis Results

	Beta	**SE**	***t***	**P<0.1**
Total direct effect				
Financial Knowledge -> Financial Behaviour	0.148	0.025	5.906	0. 000
Total indirect effect				
Financial Knowledge -> Financial Behaviour	0.092	0.01	8.986	0. 000

4.4 Testing group differences

In order to analyse the effect of discrete moderating variables which are divided into groups, such as gender, stakeholder groups, multi group analysis (MGA) was used (Vinzi et al., 2010). As it can be seen in Table 5, gender difference is not seen in any of the paths of the model concluding that gender has no effect. As shown in Appendix 7, the Chinese and Indians possessed the highest financial knowledge and behaviour and the highest financial attitude respectively.

Table 5: Effect of gender

Path	Beta difference (female - male)	*p*-value (female vs male)
Financial Attitude -> Financial Behaviour	0.080	0.053
Financial Behaviour -> Financial Literacy	0.028	0.620
Financial Education -> Financial Knowledge	0.133	0.998
Financial Knowledge -> Financial Attitude	0.036	0.793
Financial Knowledge -> Financial Behaviour	0.064	0.900

5. Discussion

This study explored the relationship between financial knowledge, attitude, behaviour and financial literacy from a behavioural perspective while perceiving financial literacy as a developmental process. First, financial education had a significant and positive influence on financial knowledge. As financial education acts as a preventive measure to control indebtedness (Anderloni & Vandone, 2011), the emphasis on providing adequate financial education to youth is obligatory. Yew et al. (2017) had emphasised on the importance of incorporating financial education in school and university curriculum. The current study analysed financial education in terms of "financial background" and "exposure/experience to financial education programs, sessions and opportunities". Out of the two aspects, "exposure and experience to financial education programmes" had the highest factor loading. This highlights the need to make financial education more accessible and available. Although educational background is less significant compared to with exposure aspect, it cannot be neglected in financial education. Good upbringing and proper family support for youngsters will confer benefits to result in higher financial knowledge.

Therefore, findings of the study are consistent with those of previous ones that parents are responsible to ensure youth are exposed to good parental role models.

Second, findings revealed that financial knowledge significantly and positively related to financial behaviour which is consistent with that Loke (2015), namely financial knowledge promotes a higher financial behaviour. However, the current study discovered that it is the indirect relationship between financial knowledge and behaviour that is significant. In other words, attitude plays a major role in converting knowledge to behaviour which leads to a fruitful outcome.

Additionally, financial attitude has a strong relationship with behaviour. Based on TPB, an individual always assess outcomes of a behaviour which is determined by his attitude on which he or she has a perceived control over. Therefore, youths must be well communicated about healthier outcomes of possessing better financial knowledge and proper personal finance management. This is so they can evaluate the effort and outcomes by themselves. Many youths live beyond their means and they do not have proper financial planning and therefore, a well organised efforts are needed to change their attitude. Since even those with higher financial knowledge face financial difficulties (Loke, 2015), it is important to possess appropriate attitude and this is conveyed through the proposed conceptual model. A significant negative relationship was found between financial behaviour and financial literacy among majority of the respondents.

Financial attitude's factor analysis revealed detailed insights. Attitude measures included two perspectives: attitude towards "future, non-impulsiveness" and attitude toward the "achievement orientation". Items related to "future, impulsiveness" had the highest loadings. This suggest that young working adults must be educated on the importance of setting long term financial goals and the means to achieve them. Malaysian youths face challenges related to high cost borrowings, personal loans and credit card borrowings (Asian Institute of Finance, 2015) and face financial distress as they live beyond their means due to their lack self - control (Loke, 2015).

No gender differences were observed on any paths of the model indicating that financial literacy awareness programmes can be designed to benefit the youths at large in Malaysia. Unemployment among females and overall youth unemployment is higher than adult unemployment in Malaysia (International Labour Organization, 2016). Since life expectancy rate is also increasing (Financial Stability and Payment Systems Report, 2015), young working adults are overburdened to provide for their dependents while being prepared for their own retirements. Previously, government employees who are entitled for a pension scheme had lesser motivation and possessed less financial knowledge (Loke, 2015) though

they too are vulnerable to financial shocks. Government pension schemes may serve as a security net only to government employees. Therefore, an adequate amount of financial knowledge with appropriate attitude at young age will uplift lives, regardless of gender, occupation and government pension schemes. It was found the Chinese possess the highest financial knowledge and behaviour while Indians possess the highest financial attitude. Nevertheless, higher financial knowledge and financial literacy help to reduce economic disparities between ethnic groups (Loke, 2015).

6. Conclusion and Implications

Unlike prevailing econometrics analysis in finance, the study was aimed at examining financial literacy from a behavioural perspective based on theory of planned behaviour (TPB). This study has shown lack of financial literacy and poor financial management practices affect many young Malaysians and therefore, financial education is vital to guide their financial behaviour. Further, it was found financial attitude mediates the effect of financial knowledge on behaviour and hence, youths need have correct attitude to benefit from financial knowledge. Financial behaviour was observed to be lower among the young working adults though gender had no effect in any of the relationships. Hence, the study findings and implications are applicable to all Malaysians.

Findings emphasise that financial education must be introduced in schools and colleges as part of their curriculum. In addition, parents have a responsibility by being good role models which would shape their children's financial behaviour at early stages of their lives. Further, authorities must ensure the availability and ease of access to financial experts and counsellors for young working adults for them to receive proper advice. Findings on the importance and the influence of attitude on overall financial literacy must be well communicated to independent financial counsellors and advisors to have an impact on their services.

Further, young working adults must be made aware on the importance of possessing right financial behaviour by budgeting, control over their spending, practise living within means, continuous monitoring of expenses, practice of saving and planning for old age and unexpected expenses. Families and educational institutes must encourage the young to save, train them not to be impulsive with unnecessary, unplanned buying and to be achievement orientated. For this purpose, they must be guided to consider alternative financial products, policies and companies before making any final decision on financial matters. Further, they must be educated on the importance of expenditure monitoring and saving behaviour.

Acknowledgement

Financial support from Social Security Research Centre, University of Malaya (UM.E/SSRC/628/3/12) is gratefully acknowledged.

References

Agarwal, S., Amromin, G., Ben-David, I., Chomsisengphet, S., & Evanoff, D. D. (2010). Financial counseling, financial literacy, and household decision making. *Pension Research Council WP 2010-34*.

Agarwalla, S. K., Barua, S. K., Jacob, J., & Varma, J. R. (2015). Financial literacy among working young in urban India. *World Development, 67*, 101-109.

Ajzen. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*(2), 179-211.

Ajzen, Fishbein, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Anderloni, L., & Vandone, D. (2011). Risk of overindebtedness and behavioural factors *risk tolerance in financial decision making*. In Lucarelli C., Brighetti G. (eds), Risk Tolerance in financial decision making (pp.113-132). London: Palgrave Macmillan.

Anthony, R., & Sabri, M. F. (2015). Financial management practices of medical practitioners in the private and public medical service in malaysia. *International Review of Management and Business Research, 4*(4), 1105-1117.

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: a meta- analytic review. *British Journal of Social Psychology, 40*(4), 471-499.

Asian Institute of Finance. (2015). *Finance matters: understanding gen y,* .Retrieved from https://www.aif.org.m y/clients/aif_d01/assets/multimediaMS/publication/Finance_Matters_Understanding_Gen_Y_Bridging_the_Knowledge_Gap_of_Malaysias_Millennials.pdf.

Atkinson, A. and F. Messy (2012). *Measuring financial literacy: results of the OECD / International network on financial education (infe) pilot study. OECD Working Papers on Finance, Insurance and Private Pensions*, No. 15. Paris: OECD Publishing.

Australia and New Zealand Banking Group Limited (ANZ). (2015). *ANZ survey of adult financial literacy in Australia*. Retrieved from https://www.anz.com/resources/3/1/31cbc1fd-9491-4a22-91dc4c803e4c34ab/adult-financial-literacy-survey-full-results.pdf.

Barclay, D., Higgins, C., & Thompson, R. (1995). The partial least squares (pls) approach to casual modeling: personal computer adoption and use as an illustration. *Technology Studies, 2*, 285-309.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Batty, M., Collins, J. M., & Odders- White, E. (2015). Experimental evidence on the effects of financial education on elementary school students' knowledge, behavior, and attitudes. *Journal of Consumer Affairs, 49*(1), 69-96.

Bir, J. S. (2016). Knowledge, attitude and their effect on the recently graduated employees' financial management practices and satisfaction. *Economic Literature, 12*, 69-81.

Bolaji-Adio, A., Iarossi, G., Perotti, V., & Zottel, S. (2013). Making sense of financial capability surveys around the world: a review of existing financial capability and literacy measurement instruments. Retrieved from http://documents.worldbank.org/curated/en/220801468323962930/Making-sense-of-financial-capability-surveys-around-the-World-a review-of-existing-financial-capability-and-literacy-measurement-instruments

Borden, L. M., Lee, S.-A., Serido, J., & Collins, D. (2008). Changing college students' financial knowledge, attitudes, and behavior through seminar participation. *Journal of Family and Economic Issues, 29*(1), 23-40.

Bruhn, M., de Souza Leão, L., Legovini, A., Marchetti, R., & Zia, B. (2013). Financial education and behavior formation: large-scale experimental evidence from Brazil. *Presentation. Washington, DC*: World Bank.

Carpena, F., Cole, S. A., Shapiro, J., & Zia, B. (2011). Unpacking the causal chain of financial literacy. Policy Research working paper ; no. WPS 5798. Washington, DC: World Bank. Retrieved from http://documents.worldbank.org/curated/en/329301468322465624/Unpacking-the-causal-chain-of-financial-literacy.

Chien, Y.-W., & Devaney, S. A. (2001). The effects of credit attitude and socioeconomic factors on credit card and installment debt. *Journal of Consumer Affairs, 35*(1), 162-179.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research, 295*(2), 295-336.

Conger, R. D., Conger, K. J., Matthews, L. S., & Elder, G. H. (1999). Pathways of economic influence on adolescent adjustment. *American Journal of Community Psychology, 27*(4), 519-541.

Danes, S. M., & Hira, T. K. (1990). Knowledge, beliefs, and practices in the use of credit cards. *Family and Consumer Sciences Research Journal, 18*(3), 223-235.

Danes, S. M., Huddleston-Casas, C., & Boyce, L. (1999). Financial planning curriculum for teens: impact evaluation. *Journal of Financial Counseling and Planning, 10*(1), 26-39.

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, Texas: Harcourt Brace Jovanovich College Publishers.

Fernandes, D., Lynch Jr, J. G., & Netemeyer, R. G. (2014). Financial literacy, financial education, and downstream financial behaviors. *Management Science, 60*(8), 1861-1883.

Financial Stability and Payment Systems Report. (2015). *Market conduct and consumer empowerment*. Central Bank of Malaysia. Retrieved from https://www.bnm.gov.my/files/publication/fsps/en/2015/cp04.pdf.

Folk, J. Y., Beh, L. S., & Baranovich, D.-L. (2012). Financial education: determinant of retirement planning in Malaysia. *E3 Journal of Business Management & Economics, 3*(2), 69-78.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18(1)*, 39-50.

Friedman, M. (1957). *A theory of the consumption function*. Princeton: Princeton University Press.

Gathergood, J., & Disney, R. F. (2011). Financial literacy and indebtedness: New evidence for UK consumers.

Go, C. G., Varcoe, K., Eng, T., Pho, W., & Choi, L. (2012). Money savvy youth: evaluating the effectiveness of financial education for fourth and fifth graders, Working Paper, 2. *San Francisco, CA: Federal Reserve Bank of San Francisco.*

Hair Jr, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.) London: Prentice Hall International.

Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*. London: Sage Publications.

Hayhoe, C. R., Leach, L. J., Allen, M. W., & Edwards, R. (2005). Credit cards held by college students. *Journal of Financial Counseling and Planning, 16(1),*1-10..

Hilgert, M. A., Hogarth, J. M., & Beverly, S. G. (2003). Household financial management: the connection between knowledge and behavior. *Federal Reserve Bulletin, 89*, 309-322.

Hinton, P. R., McMurray, I., & Brownlow, C. (2004). *SPSS explained*. New York: Routledge.

Hung, A., Parker, A. M., & Yoong, J. (2009). *Defining and measuring financial literacy*. RAND Working Paper Series WR-708. Santa Monica, CA: RAND Corporation.

Huston, S. J. (2010). Measuring financial literacy. *Journal of Consumer Affairs, 44*(2), 296-316.

International Labour Organization. (2016). *Youth employment policy summary - Malaysia*. Retrieved from http://www.ilo.org/asia/publications/WCMS_534280/lang--en/in dex.htm.

Jappelli, T., & Padula, M. (2013). Investment in financial literacy and saving decisions. *Journal of Banking & Finance, 37*(8), 2779-2792.

Jay, B. N. (2017). Young Malaysians lacking in financial knowledge, need to start investing. Retrieved from https://www.nst.com.my/news/nation/2017/10/290665/young-malaysians-lacking-financial-knowledge-need-start-investing

Johnson, E., & Sherraden, M. S. (2007). From financial literacy to financial capability among youth. *The Journal of Sociology. & Social Welfare, 34(3)*, 119-145.

Jorgensen, B. L., & Savla, J. (2010). Financial literacy of young adults: the importance of parental socialization. *Family Relations, 59*(4), 465-478.

Kempson, E., Perotti, V., & Scott, K. (2013). *Measuring financial capability: a new instrument and results from low-and middle-income countries*. Washington DC : World Bank.

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (IJeC), 11*(4), 1-10.

Loke, Y. J. (2015). Financial knowledge and behaviour of working adults in Malaysia. *Margin: The Journal of Applied Economic Research, 9*(1), 18-38.

Lusardi, A. (2012). Financial literacy or financial capability? *Financial Literacy and Ignorance* (Vol. 2017). Washington, USA. Retrieved from http://annalusardi.blogspot.com/2012/10/financial-literacy-or-financial.html.

Lusardi, A., Michaud, P. C., & Mitchell, O. S. (2013). *Optimal financial knowledge and wealth inequality*. Cambridge, MA: National Bureau of Economic Research.

Lusardi, A., & Mitchell, O. S. (2011). *Financial literacy and retirement planning in the United States*. Cambridge, MA: National Bureau of Economic Research.

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature, 52*(1), 5-44.

Mahdzan, N. S., & Tabiani, S. (2013). The impact of financial literacy on individual saving: an exploratory study in the malaysian context. *Transformations in Business & Economics, 12*(1), 41-55.

Malaysia Shopping Malls Association (PPK). Members List. Retrieved from http://ppkm.org.my/membership/member-lists/

Mandell L. (2008) Financial literacy of high school students. In: Xiao J.J. (eds) Handbook of Consumer Finance Research (pp. 163-183). New York, NY: Springer.

Mandell, L., & Klein, L. S. (2009). The impact of financial literacy education on subsequent financial behavior. *Journal of Financial Counseling and Planning, 20*(1), 15-24.

Meier, S., & Sprenger, C. D. (2013). Discounting financial literacy: time preferences and participation in financial education programs. *Journal of Economic Behavior & Organization, 95*, 159-174.

Modigliani, F., & Brumberg, R. (1954). Utility analysis and the consumption function: an interpretation of cross-section data. In: Kurihara, K.K., Ed., Post-Keynesian Economics (pp. 388-436). New Brunswick: Rutgers University Press.

Montano, D. E., & Kasprzyk, D. (2015). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), Health behavior and health education: Theory, research, and practice (pp. 67-96). San Francisco, CA, US: Jossey-Bass.

Peng, T.C. M., Bartholomae, S., Fox, J. J., & Cravener, G. (2007). The impact of personal finance education delivered in high school and college courses. *Journal of Family and Economic Issues, 28*(2), 265-284.

Potrich, A. C. G., Vieira, K. M., & Mendes-Da-Silva, W. (2016). Development of a financial literacy model for university students. *Management Research Review, 39*(3), 356-376.

Rutherford, L., & DeVaney, S. A. (2009). Utilizing the theory of planned behavior to understand convenience use of credit cards. *Journal of Financial Counseling and Planning, 20*(2), 48-63.

Sabri, M. F., & Juen, T. T. (2014). The influence of financial literacy, saving behaviour, and financial management on retirement confidence among women working in the Malaysian public sector. *Asian Social Science, 10*(14), 40-51.

Schmeiser, M. D., & Seligman, J. S. (2013). Using the right yardstick: Assessing financial literacy measures by way of financial well- being. *Journal of Consumer Affairs, 47*(2), 243-262.

Serido, J., Shim, S., & Tang, C. (2013). A developmental model of financial capability A framework for promoting a successful transition

to adulthood. *International Journal of Behavioral Development, 37*(4), 287-297.

Servon, L. J., & Kaestner, R. (2008). Consumer financial literacy and the impact of online banking on the financial behavior of lower- income bank customers. *Journal of Consumer Affairs, 42*(2), 271-305.

Shim, S., Barber, B. L., Card, N. A., Xiao, J. J., & Serido, J. . (2010). Financial socialization of first-year college students: The roles of parents, work, and education. *Journal of Youth and Adolescence, 39*(12), 1457-1470.

Shockey, S. S. (2002). *Low-wealth adults' financial literacy,money management behavior and associated factors, including critical thinking*. Unpublished doctoral dissertation, Ohio State University.

Stolper, O. A., & Walter, A. (2017). Financial literacy, financial advice, and financial behavior. *Journal of Business Economics, 87*(5), 581-643.

Tang Ruxyn. (2017). Bank Negara reveals the 4 biggest mistakes malaysians make when it comes to money. Retrieved from http://says.com/my/news/bank-negara-malaysia-reveals-worrying-findings-on-financial-literacy-among-malaysians

Vinzi, V. E., Chin, W. W., Henseler, J., & Wang, H. (2010). *Handbook of partial least squares: concepts, methods and applications*. Switzerland: Springer-Verlag Berlin Heidelberg.

Willis, L. E. (2008). Against financial-literacy education. *Iowa Law Review, 94(1)*, 197-285.

World Bank. (2013). Paving the road to better financial decision-making in Tajikistan: financial capability and consumer protection survey report. Retrieved from http://responsiblefinance.worldbank.org/eLibrary

Xiao J.J. (2008) Applying behavior theories to financial behavior. In: Xiao J.J. (eds) Handbook of Consumer Finance Research (pp.69-81). New York, NY: Springer.

Yew, S.Y., Yong, C.C., Cheong, K-C., & Tey, N.P. (2017). Does financial education matter? education literacy among undergraduates in Malaysia. *Institutions and Economies, 9*(1), 43-60.

Yoong, J., Mihaly, K., Bauhoff, S., Rabinovich, L., & Hung, A. (2013). *A toolkit for the evaluation of financial capability programs in low-, and middle-income countries*. Washington DC: World Bank. Retrieved from http://j.mp/2nXNAKB.

Zottel, S., Perotti, V., & Bolaji-Adio, A. R. f. (2013). Financial capability surveys around the world : why financial capability is important and how surveys can help. Retrieved from http://responsiblefinance.worldbank.org/~/media/GIAWB/FL/Documents/Publications/Whyfinancial-capability-is-important.pdf.

Appendices

Appendix 1: Sample based on Ethnicity

Ethnicity	Frequency	Percent
Malay	1096	57.2
Chinese	603	31.5
Indian	176	9.2
Other	40	2.1
Total	1915	

Appendix 2: Discriminant Validity Statistics

	Financial Attitude	Financial Behaviour	Financial Education	Financial Knowledge	Financial Literacy
Fornell-Larcker Criterion					
Financial Attitude	**0.668**				
Financial Behaviour	0.360	**0.605**			
Financial Education	0.113	0.309	**0.818**		
Financial Knowledge	0.289	0.243	0.126	**1.000**	
Financial Literacy	0.105	-0.071	-0.091	-0.020	**0.789**
Heterotrait-Monotrait Ratio (HTMT)					
Financial Behaviour	0.393				
Financial Education	0.122	0.431			
Financial Knowledge	0.319	0.243	0.115		
Financial Literacy	0.154	0.160	0.169	0.031	

Appendix 3: Loadings and Cross Loadings

	Financial Attitude	Financial Behaviour	Financial Education	Financial Knowledge	Financial Literacy
FA1	**0.581**	0.244	0.052	0.122	0.052
FA2	**0.767**	0.376	0.088	0.252	0.031
FA3	**0.525**	0.116	0.060	0.181	0.077
FA4	**0.708**	0.205	0.050	0.218	0.080
FA5	**0.663**	0.205	0.090	0.192	0.070
FA6	**0.708**	0.191	0.079	0.174	0.132
FA7	**0.692**	0.254	0.103	0.188	0.082

Appendix 3:(Continue)

	Financial Attitude	Financial Behaviour	Financial Education	Financial Knowledge	Financial Literacy
FB1	0.263	**0.588**	0.172	0.064	0.037
FB2	0.245	**0.563**	0.153	0.014	0.048
FB3	0.245	**0.618**	0.205	0.209	-0.038
FB4	0.343	**0.732**	0.171	0.199	0.028
FB5	0.141	**0.557**	0.163	0.169	-0.080
FB6	0.128	**0.546**	0.197	0.165	-0.131
FB7	0.105	**0.574**	0.246	0.076	-0.111
FB8	0.087	**0.547**	0.276	0.063	-0.153
FB9	0.247	**0.693**	0.197	0.231	-0.095
FE1	0.000	0.180	**0.599**	0.025	-0.138
FE2	0.124	0.306	**0.989**	0.134	-0.074
FK	0.289	0.243	0.126	**1.000**	-0.020
FL1	0.100	-0.044	-0.054	-0.039	**0.765**
FL2	0.085	-0.066	-0.065	-0.014	**0.810**
FL3	0.121	-0.019	-0.054	0.023	**0.752**
FL4	0.061	-0.067	-0.098	-0.013	**0.829**

Note: *Bold figures indicate that loadings are higher than 0.5 and loaded to their own constructs*

Appendix 4: Collinearity Statistics – Inner VIF Values

	Inner VIF Values			
	Financial Attitude	**Financial Behaviour**	**Financial Knowledge**	**Financial Literacy**
Financial Attitude		1.091		
Financial Behaviour				1.000
Financial Education			1.000	
Financial Knowledge	1.000	1.091		

Appendix 5: Collinearity Statistics – Outer VIF Values

Outer VIF Values	
FA1	1.291
FA2	1.560
FA3	1.215
FA4	1.581
FA5	1.453
FA6	1.705
FA7	1.537
FB1	1.948
FB2	1.916
FB3	1.255
FB4	1.515
FB5	1.349
FB6	1.344
FB7	1.973
FB8	1.900
FB9	1.416
FE1	1.291
FE2	1.291
FK	1.000
FL1	1.635
FL2	1.542
FL3	1.919
FL4	1.651

Appendix 6: Sample based on the Main Occupation

Main Occupation	Frequency	Percentage
Technician	110	5.7
Clerical/Administrative workers	341	17.8
Sales Personnel	258	13.5
Machinery and manufacturing workers	56	2.9
Labourer	107	5.6
Educator/Teacher/Lecturer	179	9.3
Finance-related professions	226	11.8
Self-employed/own or family business	215	11.2
Total	**1915**	

Appendix 7: Differences related to financial literacy among ethnic

	Malay				Chinese				Indian			
	Beta	**SE**	**t**	**p**	**Beta**	**SE**	**t**	**p**	**Beta**	**SE**	**t**	**p**
Attitude -> Behaviour	0.298	0.034	8.874	0.000	0.356	0.034	10.572	0.000	0.485	0.064	7.525	0.000
Behaviour -> Literacy	-0.068	0.050	1.352	0.177	-0.166	0.044	3.808	0.000	-0.149	0.111	1.345	0.179
Education-> Knowledge	0.146	0.031	4.788	0.000	0.126	0.041	3.058	0.002	0.173	0.070	2.453	0.014
Knowledge -> Attitude	0.255	0.030	8.645	0.000	0.337	0.043	7.854	0.000	0.366	0.062	5.924	0.000
Knowledge-> Behaviour	0.118	0.033	3.545	0.000	0.209	0.037	5.638	0.000	0.116	0.064	1.831	0.067

Institutions and Economies
Vol. 10, No. 4, October 2018, pp. 49 - 67

How Does Knowledge Sharing Affect Employee Engagement?

Sui Hai Juan[a], Irene Wei Kiong Ting[b], Qian Long Kweh[c], Liu Yao[d]

Abstract: *Employee engagement has emerged as a hot topic among academics and scholars over the last decade since organisations worldwide have adopted that lingo. However, little is known about how knowledge sharing, one of the main resources for organisations to maintain their competitive advantages, would affect employee engagement. Therefore, the objective of this study is to assess the impact of knowledge sharing on employee engagement based on the social capital theory. Data was obtained via questionnaires distributed to 180 randomly selected academics of public and private universities in Malaysia. This study applies multiple regression models to examine how three dimensions of knowledge sharing, namely structural, relational and cognitive, affect employee engagement. The results show all three aspects of knowledge sharing significantly and positively affect employee engagement. Specifically, work environment, leadership, organisational policies, communication, training and career development, compensation and team and co-workers in the knowledge sharing context improve employee engagement. This study is among the first to examine how organisations can better utilise knowledge sharing to engage their employees at work, which in turn help the organisation attain and sustain competitive advantages. Therefore, the addresses of knowledge sharing and employee engagement in this study are important and deserve further enrichments by including other knowledge management practices in the models.*

Keywords: knowledge sharing, employee engagement, social capital theory, knowledge management practices
JEL classification: M12, M5

Article received: 21 January 2018; Article accepted: 20 August 2018

1. Introduction

The topic of employee engagement has received much scholarly attention as it helps organisations retain intellectual capital (Robinson, Perryman &

[a] Corresponding Author. Faculty of Industrial Management, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia. *Email: suilucy91@gmail.com*
[b] Faculty of Industrial Management, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia. *Email: irene@ump.edu.my*
[c] Benchmarking Research Group, Faculty of Accounting, Ton Duc Thang University, Ho Chi Minh City, Vietnam. *Email: qianlong.kweh@tdtu.edu.vn*
[d] Faculty of Industrial Management, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia. *Email: xiaoyao6554@gmail.com*

Hayday, 2004), achieve higher productivity and increase profits (Wellins, Bernthal & Phelps, 2005). In other words, employee engagement enables organisations to gain competitive advantage (Song & Chermack, 2008) because employees are focused on improving their performance. To this end, knowledge sharing is fundamental and an important domain in retaining competitive advantage (Teng & Song, 2011), particularly in terms of employee engagement. It is worth noting that shared knowledge constitutes potential assets, which would improve organisational performance. Knowledge, defined as expertise, habit, skills, experience and understanding derived from trainings or learning processes, is a key source of competitive advantage for organisations in the 21st century (Maldonado-Guzmán, Lopez-Torres, Garza-Reyes, Kumar & Martinez-Covarrubias, 2016; Shabrina & Silvianita, 2015). However, little is known about the relationship between knowledge sharing and employee engagement. In other words, how does knowledge sharing affect employee engagement?

Since researchers have rarely bridged knowledge sharing with employee engagement, this study attempts to examine the effects of three dimensions of knowledge sharing (i.e. structural, relational and cognitive) on employee engagement. In order to achieve this objective, the study adopted a survey method whereby questionnaires were distributed to 180 academics working at two Malaysian universities. Higher education is undergoing transformation due to stiff competition and it is time universities play their own role and function especially on sharing knowledge efficiently and effectively (Kruger & Snyman, 2005) to avoid losing their own competitive advantages. Therefore, this study was undertaken to better gauge the effect of knowledge sharing on employee engagement.

The remainder of this paper is organised as follows: Section 2 contains theoretical discussions, research conceptual model and research hypothesis of this study. Section 3 focuses on data collection while Section 4 presents research findings, statistical tools, the discussion of key findings and implications. Finally, section 5 concludes this study with future recommendation.

2. Literature Review

Abu Bakar (2013) stated that Malaysia is a multi-ethnic society with a mixture of Islamic, Eastern and Western values. However, as Muslims are the majority in the country, most work values here are influenced by Islamic teachings (Abu Bakar, 2013). Therefore, employees working in Malaysia may have different responses to knowledge sharing and employee engagement compared with those working in the West. However, studies

on the effect of knowledge sharing on employee engagement, particularly among Malaysian employees, are limited.

2.1 Knowledge sharing

Knowledge, especially know-hows, experience, best practices, contextual information, is regarded as the most valuable asset in any organisation (Snyman & Kruger, 2004). Knowledge is an insight that generates a framework for identifying and combining new knowledge (Davenport & Prusak, 1998). It consists of data and information that has been organised and processed to convey understanding and lessons learnt (Wetherbe, Turban & Mclean, 1999). It covers intangible or tangible experience, which flows throughout the organisation (Lai, 2013). Classified as explicit knowledge and tacit knowledge (Nonaka, 1994), the former is tangible knowledge, such as procedures, rules, regulations and electronic database, which can be easily accessed. Tacit knowledge on the other hand is the knowledge hidden in an individual's mind in the form of experience and expertise (Leonard & Sensiper, 1998), which is usually hard to communicate and it needs to be obtained through frequent interaction with others (Brown & Duguid, 2000). In an organisational context, employees have both tacit and explicit knowledge (Li et al., 2009).

In this regard, knowledge sharing has become increasingly significant to modern organisations in the knowledge-based economy (Obembe, 2010); it helps to explore whether the knowledge that exists before within the organisation can be discovered and utilised by employees who needs it (Obeidat, Al-Suradi, Masa'deh & Tarhini, 2016). Many social theorists have debated on the importance of social action in knowledge transfer processes (Obembe, 2010). Social capital theory argues that organisations have the potential for creating and sharing knowledge through networks, interaction and learning to improve their innovative capabilities (Landry, Amara & Lamari, 2002). This study adopts the social capital theory to explain knowledge sharing in organisations by viewing knowledge sharing from three dimensions, namely structural, relational and cognitive.

Mu, Peng and Love (2008) agree that knowledge sharing is a social process where employees are willing to share their valuable information and knowledge with others. It relates to sharing resources that are non-substitutable, inimitable, rare and valuable opening up new opportunities to individuals and organisations alike (Pinho, 2016). Specifically, knowledge sharing refers to the provision of task information and knowledge and skills

to help others and to collaborate with others to deal with problems, create original ideas, or carry out policies or procedures (Cummings, 2004).

2.1.1 Structural knowledge sharing

The structural dimension of knowledge sharing is the network ties (Nahapiet & Sumantra, 1998) and communication between members of a social network (Bolino, Turnley & Bloodgood, 2002). It acts as a medium for information flow and resource exchanges (Aslam, Shahzad, Syed & Ramish, 2013). Personal interactions through meetings, teamwork, emails or online discussion forums facilitate access to various knowledge sources among employees and such practices will develop the capabilities of the group through building and exchanging knowledge (Song & Chermack, 2008). Wang and Noe (2010) propose that such communities contribute to learning and transferring essential information. Since knowledge resides in employees' mind and sharing is based on the relationship they have, structures or networks are important considerations in knowledge sharing. Similarly, Hansen (1999) opine that as employees are sources of information, their ability to share and the level of sharing depends on the strength of their relationships. (Chiu, Hsu & Wang, 2006) further categorised social interaction ties into: (i) the relationships, (ii) time spent and (iii) frequency of interaction among employees.

2.1.2 Relational knowledge sharing

Nahapiet and Sumantra (1998) define the relational dimension of knowledge sharing as "trust, norms and commitment within the organization," which is based on relationships that the employees possess. Social needs (e.g. sociability, approval and prestige) require these relationships that can change employee values and their behaviour in terms of respect and friendship (Nahapiet & Sumantra, 1998), growth in trust (Chow & Chan, 2008) and promote identification among each other (Bolino et al., 2002). Thus, along with the network of relationships, the key elements of this dimension are: (i) trust, which is a promoter for social interaction and cooperation and it opens up avenues for knowledge sharing. Members of the organisation who trust one another are willing to share their knowledge since they have no fear of being exploited by the other members (Aslam et al., 2013). (ii) norm of reciprocity, which means knowledge sharing that is reciprocal (Chiu et al., 2006). It is assumed that knowledge sharing by a member is induced by the expectation that others

would reciprocate the act when required (Aslam et al., 2013). (iii) identification process, which causes people to perceive they belong to a team. It plays an important resource role that affects the sense of benefit from knowledge sharing (Nahapiet & Sumantra, 1998) through a member's sense of belonging towards an organisation (Aslam et al., 2013).

2.1.3 Cognitive knowledge sharing

Cognitive dimension of knowledge sharing refers to resources that allow common interpretations and meanings within an organisation (Chow & Chan, 2008). Employees can tap easily into others' tacit knowledge by accessing these resources (Abou-Zeid, 2007). Common language or vision support a mutual understanding of unified goals and norms of action in social situations. In organisations, shared vision and values enhance cognitive dimension of knowledge sharing (Tsai & Ghoshal, 1998). At the individual level, cognitive knowledge sharing is the result of frequent interactions and sharing the same way of conducting employee affairs which lead the individuals to learn skills and know-hows (Wasko & Faraj, 2005). Shared vision, shared language and shared goals were built by bringing employees together to create the foundation for trust, which plays an important role for cementing organisational relationships and thus enhances capabilities of knowledge sharing (Levin, Cross, Abrams & Lesser, 2002). Thus, along with the network of relationships, the key elements of this dimension are: (i) shared language, which aids individuals in understanding one another better. It encourages employees to enjoy in knowledge sharing activities and improves the quality of shared knowledge in the organization (Chiu et al., 2006). (ii) shared vision, which includes common goals and aspirations of organisational members. Common understanding enhances resource sharing while minimising misunderstandings (Aslam et al., 2013). The common goals aid the members in perceiving and enjoying these benefits (Aslam et al., 2013).

2.2 Employee engagement

Since it has been identified as a crucial factor for organisations to attain competitive advantage, employee engagement has been extensively discussed. According to Sanford (2002), higher employee engagement helps in reducing accidents, decrease rates of absenteeism and turnover while increasing performance (Juan & Yao, 2017). Kahn (1990) proposes employee engagement as the harnessing of members' talent to match their

roles and whereby employees express themselves physically, cognitively and emotionally during role performances. Three psychological states determine whether employees are engaged or disengaged at work, namely psychological meaningfulness, psychological safety and psychological availability (Bailey, Madden, Alfes & Fletcher, 2017; Kahn, 1990).

Furthermore, Peters (2007) highlights employee engagement relates to employee commitment, which means the workers are pride of their organisation and the degree to which they intend to stay, desire to perform with their best and align their goals with organisational goals. He further emphasises that engagement creates job satisfaction and employee happiness. Fleming and Asplund (2007) conclude employee engagement as the ability to capture employees' soul, hearts and minds to strive for excellence. Juan, Yao, Tamyez and Ayodele (2016) suggest employee engagement as an opportunity for employee connection and motivation to be a part of the organisation. Hewitt (2004) further explain that employee engagement is where individuals are emotionally and intellectually committed to the organisation; for example, employees have intense desires to be a member of the organisation despite opportunities to work elsewhere and employees spend extra time, effort and initiative to contribute to the success of the business (Baumruk, 2006). Newman and Harrison (2008) point out that engagement is the simultaneous presence of three behaviours in employees: job performance, citizenship behaviour and involvement. Cook (2008) reveals employee engagement as "how employees positively think and feel about their organisation and is proactive in relation to achieving organizational goals." Definitions of employee engagement indicate workers could be engaged not only in their feeling but also in their thinking and behaviour.

2.3 Linkage between knowledge sharing and employee engagement

The process of those determinants affecting employee engagement through its three dimensions (i.e. affective, behavioural and cognitive) are intertwined with the processes of knowledge sharing via its three dimensions (i.e., structural, relational and cognitive). Hence, the inherently latent linkages between knowledge sharing and employee engagement are discovered and such linkages are contributions from knowledge sharing towards employee engagement. As discussed above, the dimensions of structural knowledge sharing (KSS), relational knowledge sharing (KSR) and cognitive knowledge sharing (KSC) are considered as independent variables while EE is dependent variable. Therefore, this study attempts to

close the gap by simultaneously linking the three dimensions of knowledge sharing with EE.

Accordingly, research hypotheses are proposed based on the review of different studies (Gupta & Singh, 2017; Kim & Park, 2017). According to Bolino et al. (2002) and Knox-Davies (2013), the KSS dimension involves interaction between members of the organisation by physical or electronic means, such as meeting, teamwork, emails, or online discussion forums, enhance relationships between them, thereby improve employee engagement. Thus, hypothesis 1 is developed as follows:

> H1. *The structural dimension of knowledge sharing positively affects employee engagement.*

Second, trust is a key determinant of employee engagement (Abrams, Cross, Lesser & Levin, 2003). Wenbin, Fengjun and Hui (2012) find that norm of reciprocity is positively related to employee engagement. Saks (2006) reveals identification is significantly influencing employee engagement. Hence, in terms of the KSR dimension, hypothesis 2 is proposed as follows:

> H2. *The relational dimension of knowledge sharing positively affects employee engagement.*

Third, the KSC dimension includes shared vision and shared language Nahapiet and Sumantra (1998); by accessing to these resources, employees are able to tap into each other's tacit knowledge base (Abou-Zeid, 2007) and easily understand each other, thereby facilitate employee engagement. Hence, hypothesis 3 is developed as follows:

> H3. *The cognitive dimension of knowledge sharing positively affects employee engagement.*

3. Data Collection and Variable Measurements

Salleh, Ahmad and Syed-Ikhsan (2008) point out knowledge sharing is a crucial element in higher education institutions. However, knowledge sharing among academics working at universities in Malaysia are lacking in factors that foster sharing of knowledge within organisations (Shabrina & Silvianita, 2015). This is evident in the number of academics working at

universities, which declined from 32,992 in 2010 to 24,476 in 2013 as the academics in Malaysian universities are disengaged (DOSM, 2015). Universities (both public and private) play important roles in enhancing national development and developing knowledgeable individuals. In addition, academics in public and private universities are crucial for effective administration and in generating profits for country (Ali & Panatik, 2015). Thus, it is important for policy makers of Malaysian universities to understand how knowledge sharing could affect employee engagement.

In order to attain the objective, survey questionnaire was adopted to seek responses from academics at two Malaysian universities (one public university and one private university). The respondents were chosen on a simple random sampling basis. Specifically, 180 academics participated in this study, 90 each from the public university and the private university. The survey instruments adapted questions from previous studies (Aslam et al., 2013; Naicker, 2013). A five-point Likert Scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree) was used for each question (see Tables 2 and 3).

Table 1 contains the results of reliability test of the sample; each variable shows Cronbach's Alpha coefficient value of higher than 0.7, indicating they are reliable for the other tests.

Table 1: Statistics Pertaining to Reliability of Variables

Variables	Number of items	Items deleted	Cronbach's Alpha
KSS	3	-	0.822
KSR	7	-	0.857
KSC	3	-	0.778
EE	12	-	0.909

Next, a confirmatory factor analysis is performed. Table 2 shows three different factors were extracted for knowledge sharing and the total variance explained is 62.05%. Factor 1 (including items 4, 5, 6, 7, 8, 9, 10) with its eigenvalue of 6.34 is the relational dimension (KSR) while Factor 2 (including item 1, 2, 3) with its eigenvalue of 1.28 is called the structural dimension (KSS). Factor 3 (including item 12, 13, 14) with its eigenvalue of 1.07 is referred to as the cognitive dimension (KSC). Additionally, item 11 was deleted from this analysis as its Varimax value is less than 0.45. The KMO measure of sampling adequacy is 0.872, indicating sufficient inter-correlations while the Bartlett's Test of Sphericity is significant at 99% confidence level (Chi square = 1,264.086). These results confirm all items used to measure a construct loaded on a single factor as each item has a Varimax value of 0.45 and above (Hair anderson, Tatham & Black, 1998).

Table 2: Results of Factor Analysis for KS

Rotated Component Matrix[a]			
	Factors		
	1	**2**	**3**
1. I maintain close social relationships with some members in my academic social network.		0.765	
2. I spend a lot of time interacting with some members in my academic social network.		0.768	
3. I have frequent communication with some members in my academic social network.		0.801	
4. Members in my academic social network are truthful in sharing knowledge.	0.625		
5. Members in my academic social network will not take advantage of others even when the opportunities arise.	0.676		
6. I have the feeling of togetherness in my academic social network.	0.729		
7. I have positive feeling towards my academic social network.	0.734		
8. I feel a sense of belonging towards my academic social network.	0.667		
9. I believe that members in my academic social network will help me if I am in need.	0.604		
10. I know that other members in my academic social network will help me, so it is only fair to help others.	0.563		
11. Members in my academic social network use common terms and language when sharing their knowledge with others.			
12. Members in my academic social network use understandable communication patterns during discussions.			0.469
13. Members in my academic social network share organisational mission with others.			0.851
14. Members in my academic social network share the same vision and goal with others.			0.877
Eigenvalue	6.34	1.28	1.07
Percentage Variance Extracted (62.05)	24.76	20.15	17.14

Three distinct factors with eigenvalue at 1.0 were extracted for employee engagement (EE) where those of Factor 1 (affective dimension) and Factor 2 (cognitive dimension) are 6.07 and 1.44 respectively, while that of Factor 3 (behaviour dimension) is 0.96 (see Table 3). The total variance explained by these three factors is 71.51%. The KMO measure of sampling adequacy is 0.865 indicating sufficient inter-correlations, while the Bartlett's Test of Sphericity is significant (Chi square = 1,305.766, $p < 0.01$). These results confirm each of these constructs is unidimensional and factorially distinct and that all items used to measure a construct loaded on a single factor as their Varimax values are greater than 0.45 (Hair et al., 1998).

Table 3: Results of Factor Analysis for EE

Rotated Component Matrix[a]			
	Factors		
	1	**2**	**3**
1. I feel confident that I can meet my goals.	0.854		
2. I am excited about how my work matters to my team.	0.841		
3. I am excited about how my work matters to my organisation.	0.807		
4. I am happy to take on new responsibilities as the need arises.	0.678		
5. I look for ways to improve the way I work.			0.830
6. I work to ensure that I assist in meeting my organisation's objectives.			0.638
7. I look for ways to reduce costs.			0.666
8. I work to maintain my focus on being more efficient.			0.734
9. I recognise the link between what I do and organisational objectives.		0.632	
10. I understand how my efforts are contributing to meeting the organisation's objectives.		0.707	
11. I have a good idea of what the organisation is trying to accomplish.		0.750	
12. I understand how my work impacts on service delivery of my organisation.		0.805	
Eigenvalue	6.07	1.44	0.96
Percentage of Variance Extracted (70.51)	25.83	25.28	19.40

4. Findings and Discussion

4.1 Findings

This section discusses respondents' demographics, the difference between the public and private universities and the correlation matrix. This is followed by the results of the regression analysis. Table 4 shows the respondents' demographic details, where it can be seen the number of male respondents (105 or 58.3%) are greater. Majority of the respondents are between 25 and 44 years old. Most of them are senior lecturers with PhD holders from the Faculty of Chemical and Natural Resources Engineering (15.6%) and the Faculty of Industrial Science and Technology (13.9%). Majority of the respondents have more than 10 years of academic experience. Almost all participating academics have worked for more than 2 years in their currently attached universities.

Table 4: Demographic Profile of Respondents

Variables	**Frequency**	**%**
Gender		
Male	105	58.3
Female	75	41.7
Age		
25-34 years	66	36.7
35-44 years	64	35.6
45-54 years	30	16.7
55-64 years	20	11.1
Faculty		
Faculty of Chemical & Natural Resources Engineering	28	15.6
Faculty of Civil & Earth Resources Engineering	15	8.3
Faculty of Electrical & Electronic Engineering	2	1.1
Faculty of Industrial Science & Technology	25	13.9
Faculty of Manufacturing Engineering	3	1.7
Faculty of Mechanical Engineering	2	1.1
Faculty of Technology Engineering	3	1.7
Faculty of Industrial Management	2	1.1
Faculty of Modern Language & Human Sciences	10	5.6
Faculty of Chemical Engineering	8	4.4
Faculty of Civil Engineering	10	5.6
Faculty of Mechanical Engineering	14	7.8
Faculty of Electrical & Electronic Engineering	10	5.6
Faculty of Petroleum Engineering	13	7.2
Faculty of Geosciences Engineering	9	5.0
Faculty of Fundamental & Applied Science	9	5.0
Faculty of Management & Humanities	11	6.1
Faculty of Computer & Information Science	6	3.3
Designation		
Lecturer	53	29.4
Senior Lecturer	86	47.8
Associate Professor	31	17.2
Others	10	5.6
Level of Education		
Bachelor Degree	8	4.4
Master Degree	52	28.9
PhD	120	66.7
Years of Academic Experience		
1 - < 5 years	56	31.1
5 - < 10 years	52	28.9
≥ 10 years	72	40.0
Years of Working in the Current University		
< 2 years	23	12.8
2 - < 5 years	52	28.9
5 - < 10 years	52	28.9
≥ 10 years	53	29.4

Inspecting Q-Q plots reveal the sample data of knowledge sharing and employee engagement is normally distributed for both universities and there is homogeneity of variance as assessed by Levene's Test for Equality of Variance. Therefore, an independent samples t-test is conducted to compare the mean level of each variable between the responses from public university and those from the private university. Table 5 shows the differences in mean test of the variables; despite different points of time for the data collection from two different types of universities, the result indicates no significant differences exist in the scores of each variable between the public university and the private university. Due to the weakness of the univariate test, running a multivariate regression analysis is necessary as it would provide more reliable results.

Table 5: Differences in the Mean of Variables

Variables	Public university (mean)	Private university (mean)	*t*-value	*p*-value
KSS	3.89	3.87	0.103	0.918
KSR	3.86	3.79	0.862	0.390
KSC	3.81	3.72	0.935	0.351
EE	4.18	4.22	-0.596	0.552

Pearson correlation test is applied to test the correlation between the independent variables and the dependent variable. The results of the correlation analysis, which examines the magnitude of correlations, are shown in Table 6. The results showed there is a strong correlation between knowledge sharing and employee engagement (rKSS=0.559/0.276, $p<0.01$; rKSR=0.551/0.407, $p<0.01$; rKSC=0.401/0.272, $p<0.01$).

Table 6: Correlations Matrix

	Public university		Private university	
EE	KSS	0.559**	KSS	0.276**
	KSR	0.551**	KSR	0.407**
	KSC	0.401**	KSC	0.272**

Note: ** denotes the coefficients are significant at 1 per cent (two-tailed) test levels.

Table 7: Results of Regression Analysis

Independent variables	Dependent variable: EE							
	Public university				Private university			
KSS	0.347**			0.214**	0.176**			0.054
KSR		0.415**		0.242*		0.369**		0.310*
KSC			0.268**	0.008			0.210**	0.028
Adj. R^2	0.304**	0.296**	0.151**	0.353**	0.066**	0.106**	0.064**	0.143**
F value	39.903	38.430	16.854	17.171	7.249	17.463	7.037	5.967

Note: * and ** denote that the coefficients are significant at the 5 and 1 per cent (two-tailed) test levels respectively. The VIF values of the public-university coefficients are 1.813 (KSS), 2.096 (KSR) and 1.740 (KSC), while those of the private-university coefficients are 1.389 (KSS), 1.801 (KSR) and 1.566 (KSC).

Table 7 presents the regression results of this study. It is important to note that all of the variance inflation factors (VIF) values obtained are less than 2.5, suggesting no multicollinearity problem (Kennedy, 1998). Based on the statistical results, it can be concluded that all dimensions of knowledge sharing (i.e. KSS, KSR and KSC) have positive and significant effects on employee engagement. The determination values (adjusted R-squared) of 0.353 for the public university and 0.143 for the private university suggest that about 35 percent and 14 percent of the employee engagement is affected by its knowledge sharing among public university and private university respectively. Moreover, it is found that knowledge sharing in the public university has a greater positive impact on employee engagement. Specifically, when the three dimensions are included simultaneously in the regression analysis, KSS (β = 0.214, t = 3.001) and KSR (β = 0.242, t = 2.603) are the significant determinants of EE in the public university. However, KSR (β = 0.310, t = 2.595) is the only significant determinant of EE in the private university. The study also found KSR has the highest regression coefficient value in public and private universities.

4.2 Discussion and implication

Based on the regression results above, the study provides a few interesting insights. First, the result implies that the relational dimension of knowledge sharing positively and significantly affects employee engagement. First, greater trust among academic staff would ensure they feel they are a part of the organisational social network. When every academic fulfils the norms of reciprocity, they are more likely to stay and they may do more than what is normally expected of them (Kahn, 1990). Thus, the culture of trust, identification and norms of reciprocity should be cultivated in the organisation to help improve employee engagement.

Second, findings suggest structural knowledge sharing positively affects employee engagement. This indicates good relationships among academics in an academic social network could boost employee satisfaction and commitment in the organisation (Nahapiet & Sumantra, 1998). Additionally, employees who have spent more time interacting with others and who have frequent communications with their colleagues enjoy their work more (Chiu et al., 2006). Therefore, organisations that are interested in engaging their employees should provide opportunities for employees to interact and communicate with others in the organisation.

Third, as anticipated, cognitive knowledge sharing positively affects employee engagement. Using common terms and language are important for employee engagement to achieve high academic performance in universities (Abou-Zeid, 2007). Furthermore, shared vision or mission is an important factor of employee engagement. This allows academics to align their personal goals with organisational objectives and further improve the business outcomes (Lieberman & Dhawan, 2005). Abou-Zeid (2007) point out employees are able to tap into each other's tacit knowledge through accessing shared vision or mission, which facilitates employee engagement.

5. Conclusion

This study investigated whether knowledge sharing contributes towards employee engagement to attain ultimate business objectives. In particular, this study examined the effects of three dimensions of knowledge sharing (i.e. structural, relational and cognitive) on employee engagement. The results showed all the three dimensions of knowledge sharing significantly and positively affect employee engagement, suggesting that trust, identification and norms of reciprocity are among the significant determinants of employee engagement. Besides, opportunities for employees to interact and communicate with their colleagues throughout the organisation could improve the level of employee engagement. It is was also evident shared language and share vision would lead to higher levels of employee engagement. Future research can enlarge the scope of the study to further convince policy makers that employee engagement is a key approach to achieve competitive advantage through sharing knowledge. Additionally, it can include interviews to get an in-depth view of the questions posed because survey questionnaire may have captured the surface of the real issues. Interviews could also attract a higher number of respondents.

Reference

Abou-Zeid, E. S. (2007). A theory-based approach to the relationship between social capital and communities of practice. *The Electronic Journal of Knowledge Management, 5*(3), 257-264.

Abrams, L. C., Cross, R., Lesser, E., & Levin, D. Z. (2003). Nurturing interpersonal trust in knowledge-sharing networks. *Academy of Management Perspectives, 17*(4), 64-77.

Abu Bakar, R. (2013). *Understanding factors influencing employee engagement: a study of the financial sector in Malaysia*. Ph.D. Thesis. Universiti of Malaya, Malaysia.

Ali, N. A. T. M., & Panatik, S. A. (2015). Work values and job satisfaction among academician in public and private university. *Jurnal Kemanusiaan, 24*(2), 43 – 58.

Aslam, M. M. H., Shahzad, K., Syed, A. R., & Ramish, A. (2013). Social capital and knowledge sharing as determinants of academic performance. *Journal of Behavioral and Applied Management, 15*(1), 25 – 41.

Bailey, C., Madden, A., Alfes, K., & Fletcher, L. (2017). The meaning, antecedents and outcomes of employee engagement: a narrative synthesis. *International Journal of Management Reviews, 19*(1), 31-53.

Baumruk, R. (2006). Why managers are crucial to increasing engagement: identifying steps managers can take to engage their workforce. *Strategic HR Review, 5*(2), 24-27.

Bolino, M. C., Turnley, W. H., & Bloodgood, J. M. (2002). Citizenship behavior and the creation of social capital in organizations. *Academy of management review, 27*(4), 505-522.

Brown, J. S., & Duguid, P. (2000). *The social life of information*. Harvard Business School Press, Boston.

Chiu, C. M., Hsu, M. H., & Wang, E. T. (2006). Understanding knowledge sharing in virtual communities: an integration of social capital and social cognitive theories. *Decision support systems, 42*(3), 1872-1888.

Chow, W. S., & Chan, L. S. (2008). Social network, social trust and shared goals in organizational knowledge sharing. *Information & management, 45*(7), 458-465.

Cook, S. (2008). *The essential guide to employee engagement: better business performance through staff satisfaction*. USA: Kogan Publication.

Cummings, J. N. (2004). Work groups, structural diversity, and knowledge sharing in a global organization. *Management science, 50*(3), 352-364.

Davenport, T. H., & Prusak, L. (1998). *Working knowledge: how organizations manage what they know*. Harvard Business School Press.

DOSM. (2015). Number of private higher education institutions in Malaysia. Retrieved on 20 July 2016, from www.dosm.gov.my

Fleming, J. H., & Asplund, J. (2007). *Where employee engagement happens*. The Gallup Management Journal. New York: Gallup Press.

Gupta, B., & Singh, A. (2017). Predicting employee engagement, knowledge sharing & ocb. *Indian Journal of Industrial Relations, 52*(4), 675 – 688.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis.* 5th ed. New Jersey: Prentice Hall International Inc.

Hansen, M. T. (1999). The search-transfer problem: the role of weak ties in sharing knowledge across organization subunits. *Administrative science quarterly, 44*(1), 82-111.

Hewitt, A. (2004). Employee engagement higher at double digit growth companies. Research Brief. *Hewitt associates LLC.*

Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal, 33*(4), 692-724.

Kennedy, P. (1998). *A guide to econometrics*. 4th ed. Cambridge, Mass: MIT Press.

Kim, W., & Park, J. (2017). Examining structural relationships between work engagement, organizational procedural justice, knowledge sharing, and innovative work behaviour for sustainable organizations. *Sustainability, 9*(2), 205-220.

Knox-Davies, B. (2013). The extent to which a learning organisation culture influences employee engagement in two service based organisations in the property sector of South Africa. Ph.D. Thesis. University of Pretoria, South Africa.

Kruger, C. J., & Snyman, M. M. M. (2005). Principles and strategies for the effective management of knowledge. *Mousaion, 23*(1), 62-81.

Lai, W. H. (2013). Interoperability of implicit and explicit firm-level knowledge accumulation. *Journal of Strategy and Management, 6*(3), 229-241.

Landry, R., Amara, N., & Lamari, M. (2002). Does social capital determine innovation? to what extent? *Technological forecasting and social change, 69*(7), 681-701.

Leonard, D., & Sensiper, S. (1998). The role of tacit knowledge in group innovation. *California management review, 40*(3), 112-132.

Levin, D. Z., Cross, R., Abrams, L. C., & Lesser, E. L. (2002). Trust and knowledge sharing: a critical combination. *IBM Institute for Knowledge-Based Organizations*, *19*, 1-9.

Li, J., Brake, G., Champion, A., Fuller, T., Gabel, S., & Hatcher-Busch, L. (2009). Workplace learning: the roles of knowledge accessibility and management. *Journal of Workplace Learning*, *21*(4), 347-364.

Lieberman, M. B., & Dhawan, R. (2005). Assessing the resource base of Japanese and US auto producers: a stochastic frontier production function approach. *Management science*, *51*(7), 1060-1075.

Maldonado-Guzmán, G., Lopez-Torres, G. C., Garza-Reyes, J. A., Kumar, V., & Martinez-Covarrubias, J. L. (2016). Knowledge management as intellectual property: evidence from Mexican manufacturing SMEs. *Management Research Review*, *39*(7), 830-850.

Mu, J., Peng, G., & Love, E. (2008). Interfirm networks, social capital, and knowledge flow. *Journal of Knowledge Management*, *12*(4), 86-100.

Nahapiet, J., & Sumantra, G. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, *23*(2), 242-266.

Naicker, T. (2013). *The effect of knowledge sharing on employee engagement.* Ph.D. Thesis. University of Johannesburg, South Africa.

Newman, D. A., & Harrison, D. A. (2008). Been there, bottled that: are state and behavioural work engagement new and useful construct "wines"? *Industrial and Organizational Psychology*, *1*(1), 31-35.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization science*, *5*(1), 14-37.

Obeidat, B. Y., Al-Suradi, M. M., Masa'deh, R. E., & Tarhini, A. (2016). The impact of knowledge management on innovation: an empirical study on Jordanian consultancy firms. *Management Research Review*, *39*(10), 1214-1238.

Obembe, D. (2010). Understanding individual action: when employees contravene management directives to foster knowledge sharing. *Management Research Review*, *33*(6), 656-666.

Peters, M. (2007). Employee engagement: a research snapshot. (pp.1-2) Cross Government Research Policy and Practice Branch, Office of the Chief Information Officer, Ministry of Labour and Citizens' Services, Government of British Columbia, Canada Retrieved from http://www.cio.gov.bc.ca/local/cio/kis/pdfs/employee_engagement. pdf

Pinho, J. C. (2016). Social capital and export performance within exporter-intermediary relationships: the mediated effect of cooperation and commitment. *Management Research Review*, *39*(4), 425-448.

Robinson, D., Perryman, S., & Hayday, S. (2004). *The drivers of employee engagement Report 408*. Institute for Employment Studies, UK.

Saks, A. M. (2006). Antecedents and consequences of employee engagement. *Journal of managerial psychology*, *21*(7), 600-619.

Salleh, K., Ahmad, S. N. S., & Syed-Ikhsan, S. (2008). Knowledge management in public sector organisations: A suitable platform for e-government. *Proceedings of The 4th International Conference on e-Government (ICEG 2008)*, pp. 379 - 388.

Sanford, B. (2002). The high cost of disengaged employees. *Gallup Management Journal.* Retrieved on 20 July 2016, from http://businessjournal.gallup.com/content/247/the-high-cost-of-diseng g ed-employees.aspx

Shabrina, V., & Silvianita, A. (2015). Factors analysis on knowledge sharing at telkom economic and business school (tebs) telkom university bandung. *Procedia-social and behavioral sciences*, *169*, 198-206.

Snyman, R., & Kruger, C. J. (2004). The interdependency between strategic management and strategic knowledge management. *Journal of Knowledge Management*, *8*(1), 5-19.

Song, J. H., & Chermack, T. J. (2008). A theoretical approach to the organizational knowledge formation process: integrating the concepts of individual learning and learning organization culture. *Human Resource Development Review*, *7*(4), 424 – 442.

Sui, H. J., & Liu, Y., (2017). Considering university governance: a preliminary investigation of employee engagement in higher educational institutions in Malaysia. *Proceedings of The FGIC 1st Conference on Governance & Integrity, 3 – 4 April 2017, Yayasan Pahang, Kuantan,Malaysia*, pp. 224-232.

Sui, H. J., Liu, Y., Tamyez, P. F. B. M., & Ayodele, F. O. (2016). Review on knowledge management and employee engagement. *Proceedings* of *The National Conference for Postgraduate Research 2016*, pp. 127-134.

Teng, J. T., & Song, S. (2011). An exploratory examination of knowledge sharing behaviours: solicited and voluntary. *Journal of Knowledge Management*, *15*(1), 104-117.

Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: the role of intrafirm networks. *Academy of management Journal*, *41*(4), 464-476.

Wang, S., & Noe, R. A. (2010). Knowledge sharing: a review and directions for future research. *Human resource management review*, *20*(2), 115-131.

Wasko, M. M., & Faraj, S. (2005). Why should I share? examining social capital and knowledge contribution in electronic networks of practice. *MIS quarterly*, 35-57.

Wellins, R. S., Bernthal, P., & Phelps, M. (2005). Employee engagement: The key to realizing competitive advantage. *Development Dimensions International, 5*, 1-31.

Wenbin, W., Fengjun, L., & Hui, L. (2012). Effect of corporate social responsibility on organizational citizenship behavior from the perspective of the reciprocity theory. *Contemporary Economy & Management, 34*(11), 25 - 33.

Wetherbe, J., Turban, E., & Mclean, E. (1999). *Information technology for management: making connections for strategic advantages*. 2nd ed. New York: John Wiley and Sons.

Institutions and Economies
Vol. 10, No. 4, October, pp. 69 - 89

Ranking the Challenges of the Urban Community in Malaysia

Sotheeswari Somasundram[a], Murali Sambasivan[b], Ratneswary Rasiah[c], Tee Pei-Leng[d]

Abstract: *The urban community in Malaysia is facing rapid urbanisation and have been the beneficiary of urban development policies. The key purpose of these policies has been to enhance and improve the well-being of the urban community. However, given the diverse nature of urban planning, literature has highlighted the possibility of a mismatch between policy directions and the outcomes desired by society. The aim of this study is therefore, to determine whether urban policy measures currently implemented in Malaysia are in sync with the needs of society. This study applied the relative importance index (RII) method to understand the challenges faced by urban residents in Kuala Lumpur, Selangor, Malacca and Penang. The results revealed five challenges which are of concern to the urban community: prevalence of crime, rising cost of living, lack of employment opportunities, air pollution and traffic congestion. The findings indicate Government policies are addressing these concerns. However, for a more effective outcome, the study recommends designing urban policies in consultation with civil society.*

Keywords: Malaysia, quality of urban life, relative importance index, standard of living, urban planning
JEL classification: 053, R11, C43, J130, 018

Article received: 20 April 2018; Article accepted: 21 August 2018

1. Introduction

Urban issues and challenges have been the subject of study for many years and in fact, these have moved up the policy agenda in many countries. For example, Stegman (1995) provided an account of urban change and policy initiatives in the United State (US), while Carpenter (2006) reported that

[a] Corresponding Author. Business School of Taylor's University, Lakeside Campus, Malaysia Malaysia *Email:sotheeswari.somasundram@taylors.edu.my*
[b] Business School of Taylor's University, Lakeside Campus, Malaysia Malaysia *Email: Murali.Sambasivan@taylors.edu.my*
[c] Business School of Taylor's University, Lakeside Campus, Malaysia Malaysia *Email: Ratneswary.RASIAH@taylors.edu.my*
[d] Business School of Taylor's University, Lakeside Campus, Malaysia Malaysia Email: *PeiLeng.Tee@taylors.edu.my*

urban issues have been given serious consideration in European Union's policy agenda over many years. Zhu (2017) highlighted the role played by local governments in facing the urban challenges in China, while Chu (2017) showed how communities help build alliances between local institutions in India to handle urban challenges. It is interesting to note the challenges are different from one country to another country and within a country, the challenges can be different from one state to another and from one city to another city.

Malaysia implemented the Malaysia Urban Indicators Network (MURNInet) programme in 2002 (Shamsuddin and Rashid, 2013). This strategy was renamed MURNInet 2.0 in 2017 to reflect the current changes in the urban landscape (Federal Department of Town and Country Planning Peninsular Malaysia, n.d.). In 2006, the Government drew up the National Urbanisation Policy (NUP) within a comprehensive and integrated framework, to deliver quality urban services that would ensure creation of safer, systematic, modern and attractive towns (Federal Department of Town and Country Planning, 2006). However, over the years, given the diverse nature of urban planning, many other policies co-existed with NUP. For example, the National Green Technology Policy, the National Landscape Policy, the National Housing Policy, the National Industrial Policy and the most recent Eleventh Malaysia Plan 2016-2020 (Federal Department of Town and Country Planning, 2016) co-existed with NUP. The Government recognising the need for consolidation, formulated a comprehensive National Development Planning Framework, which horizontally integrated individual policies into National Physical Plan (NPP)(Federal Department of Town and Country Planning, 2016).

A cursory glance of the various policy measures initiated thus far, showed the Government is cognisant of urban planning challenges and hence, has been proactive in designing policies which are geared towards enhancing the quality of urban life in Malaysia. However, on reflection, a pertinent question arises: Are the policies focusing on the areas which are of concern to urban society? Studies have highlighted that there can be a mismatch between policy directions and outcomes desired by the society (Corburn, 2004; Vincent, 2006; Loh, 2012). Giap, Thye and Aw (2014) highlighted the layman will have multi-dimensional sensibilities on the aspects of liveability that contributes towards enhancing his/her quality of life. Is it possible for urban planners and policy makers to accurately decipher the challenges faced by urbanites and thus provide accordingly? With this question in mind, the aim of the present study is to understand the challenges faced by the urban community in Malaysia and whether Government policies are directed towards addressing these concerns.

It is interesting to note that many of the major cities in the world evolved without a blueprint. Kuala Lumpur (capital city of Malaysia), for

instance was a mining settlement before it grew organically into what it is today. As cities grow, planners and policy makers face unenviable task of addressing the numerous problems associated with urban planning and management. This study examines the challenges faced by four states in Malaysia, one of the fast-growing economies in South-East Asia. Critical challenges were compared by ranking the challenges using the concept of Relative Importance Index (RII) (Kometa, Olomolaiye & Harris, 1994). This approach is relatively new in urban studies but a popular approach in the construction industry to rank the delay factors (Sambasivan & Soon, 2007). A comparative study among the various states contributes as follows: (1) helps to compare the specific challenges among states, (2) helps to rank and thereby benchmark and exchange best practices between states and (3) assists the policy makers at the federal and local government levels to understand the challenges at different centres and devise appropriate strategies to improve the standard of living of residents.

2. Literature Review

2.1 Quality of urban life

The elements of urban liveability is said to encompass two key elements: first, whether the city is able to fulfil the needs and wants of its dwellers and second, whether the city's environment has the necessary elements to sustain the lives and livelihood of its residents (Ruth & Franklin, 2014). Aligned to this concept of liveability is the on-going debate on the approach to effectively measure quality of life. Balducci and Checchi (2009) highlight both quantitative and qualitative measurements can be applied as instruments, where quantitative measures include, among others, pollution, traffic, availability of public services while qualitative measures include interpersonal relationships and lifestyles. Although Gavrilidis et al., (2016) agree that both measures are complementary, they caution on the use of qualitative methods which they argue can generate biased results as perception of lifestyle and interpersonal relationship are subjective. Taking this into consideration, the following will focus on the quantitative methods of quality of urban life.

Studies have shown a number of quantitative measures that should be considered in gauging the impact of quality of urban life. Sanders, Zuidgeest and Geurs, (2015) highlight transportation concerns in Hanoi, citing congestion, pollution, noise, low levels of traffic safety as negatively impacting well-being. Environmental issues are another key factor in evaluating quality of life (Viglia et al., 2017), where concerns are raised on carbon footprint (Joffe & Smith, 2016) and waste management (Moh &

Abd Manaf, 2014). Rising crime rates in urban areas would also impact quality of life negatively, where Faria, Ogura and Sachsida (2013) highlight that type of housing and economic activity influence crime rates in cities. Interestingly, this study also highlights that proper city planning does not necessarily address the issue of crime in cities. This is a relevant point as proper town planning alone would not be sufficient to address crime rates and in all possibilities might require a complementary social policy as well. In addition, studies have highlighted other issues that impact quality of life, such as disable or senior citizen friendly city environment (Hwang & Ziebarth, 2015; Szołtysek & Otręba, 2016), compact cities (Bardhan, Kurisu & Hanaki, 2015) and heritage values (Mostafa, 2012), among others.

Urban planning and policy implementations are crucial as poor urban development can negatively impact on urban quality of life (Balducci & Checchi, 2009; Serag El Din et al., 2013). As highlighted above, there are a wide range of policies on urban development in Malaysia. This raises concern on the difficulties in comprehensively analysing all of these policies. In order to address this problem, we focus on the most current policy directions for urban development, the City Competitiveness Master Plans (CCMP) under the Eleventh Malaysia Plan from 2016 to 2020 (Economic Planning Unit, 2015) as our point of reference.

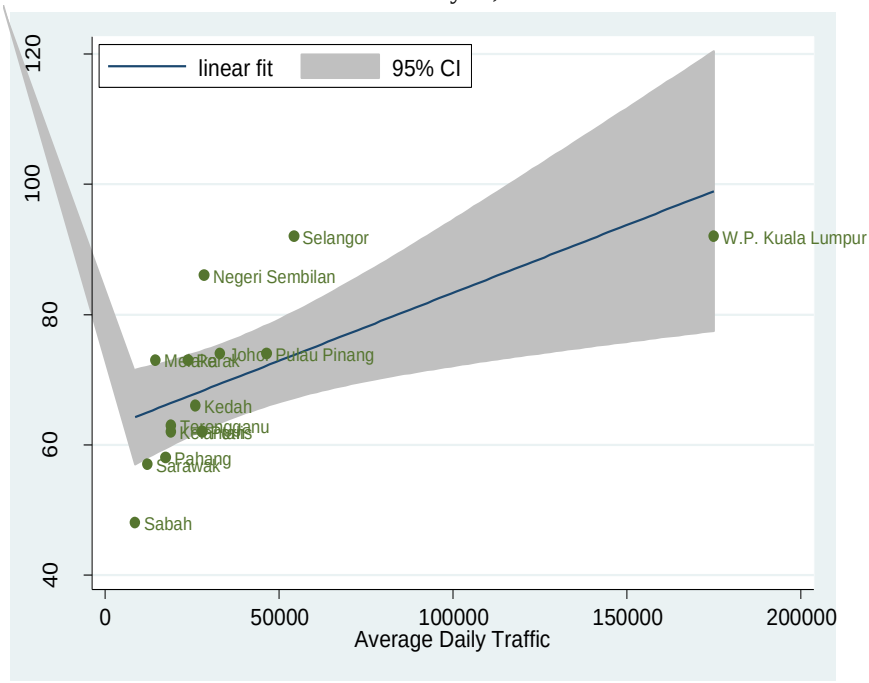
2.2 Urban challenges

There are six key principles highlighted in the CCMP framework to develop competitive cities in Malaysia (Economic Planning Unit, 2015). The first principle is to enhance economic density. Malaysian cities have lower economic density compared with other Asian cities, such as Bangkok and Jakarta (Baker & Lee, 2015). Enhancing economic density is important as it will create more jobs within a given radius, providing an environment that can better match the talent and skills of the workforce (Glaeser & Gottlieb, 2009).

The second principle of CCMP is to expand transit-oriented development, focusing mainly on reducing the use of private vehicles and increasing the use of public transport. According to TomTom International BV (2016), traffic congestion in Kuala Lumpur is responsible for an additional travel time of 158 hours for 2016. Traffic congestion is attributed to urban sprawl and poor public transportation system (Baker & Lee, 2015). The total cost in terms of wasted fuel, carbon (CO2) emissions, delays and vehicle maintenance in Kuala Lumpur is valued approximately at 1.1% to 2.2% of the Gross Domestic Product which translates to over RM3100 per resident annually (Federal Department of Town and Country Planning, 2016). Studies have highlighted a positive relationship between

traffic congestion and environmental degradation (Lee et al., 2014; Shekarrizfard et al., 2015; Shekarrizfard, Faghih-Imani and Hatzopoulou, 2016) which is also the case in the 14 states in Malaysia, as shown in Figure 1.

Figure 1: Impact of Average Daily Traffic on Air Pollution Index among 14 States in Malaysia, 2016

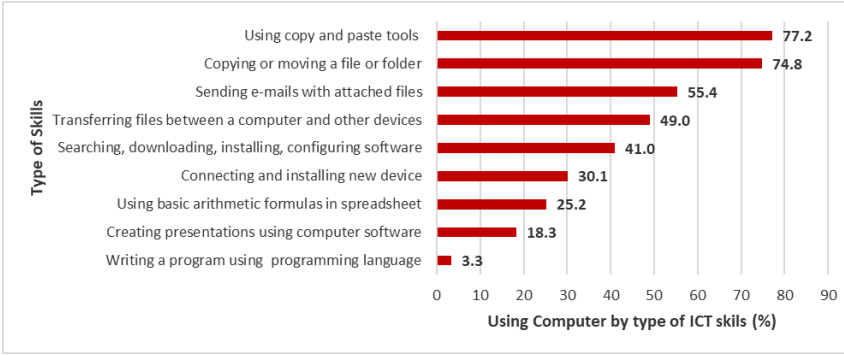


Source: Department of Environment, Malaysia and Ministry of Works, Malaysia

Another key principle under the CCMP framework is to strengthen knowledge-based clusters by designing physical hubs that will attract creative industries, Information Communication Technology (ICT) and professional services that will function as knowledge-based clusters (Economic Planning Unit, 2015). The aim is to eventually move all economic sectors towards more knowledge-intensive and high value-added activities leading to greater productivity under the Sustainable Development Goals (Economic Planning Unit, 2017). However, Evers and Gerke (2015) cautions us on focusing too much on the physical infrastructure while neglecting the human capital factor. Figure 2 illustrates the prevalence of ICT skills in Malaysia, where close to 80% of the population are Information and Technology(IT) literate but a large majority are only competent in basic skills such copying and pasting. These

statistics are disturbing as a knowledge-based cluster would require increased knowledge in ICT skills than what is demonstrated by society today.

Figure 2: Percentage of Individuals Using Computer based on ICT Skills in Malaysia, 2015



Source: Department of Statistics, Malaysia

Another key objective of the CCMP framework is to enhance urban liveability, which includes ensuring quality education and health care, providing affordable and quality housing for those in the middle and low income category (Economic Planning Unit, 2015). According to Demographia International, housing is considered affordable if the property can be financed based on less than three times a household's median annual income (Baker & Lee, 2015). A report by Khazanah Research Institute (2015) highlights that housing is unaffordable in all states in Malaysia, except Malacca which justifies the policy focus by the Government.

Promoting environmentally-friendly practices within cities have been flagged as another important outcome under the CCMP framework. Proper waste management is a concern as the current practice of open dumping and landfills (Moh and Abd Manaf, 2017) is deemed a problem as many landfill sites have surpassed its operating capacity, raising concerns on its impact on the environment and society (Manaf, Samah & Zukki, 2009). According to Moh and Abd Manaf (2014), up to 80% of the waste composition found in landfills are recyclable materials discarded by Malaysian households. Studies claim that although a host of techniques are employed to educate and create awareness on the importance of recycling, the general perception is that recycling is less important compared with other issues (Zain et al., 2012; Akil, Foziah & Ho, 2015).

The sixth and final principal under the CCMP framework is to ensure inclusivity and social integration by engaging with different stakeholders to create an environment of shared sense of responsibility (Economic

Planning Unit, 2015). Social inclusion and integration are considered vital to contribute towards quality of life (Cambir & Vasile, 2015). A report by World Bank indicated those in the urban areas between the ages of 15 and 30 are likely to be vulnerable to exclusion, citing poverty and rising costs of living as contributing factors (Baker & Lee, 2015). In the context of their study which is focused on a highly urban setting, they noted such stark differences between the poor and rich can result in frustration and compound the feelings of exclusion leading to crime and other costs to society (Baker & Lee, 2015). Studies point towards low education, long-term unemployment (Aaltonen, Kivivuori and Martikainen, 2011), poverty and inequality in income (Bruun, 2016) as instigators of social exclusion, eventually leading to rising crime rates and other social costs in the country.

3. Methodology

3.1 Data

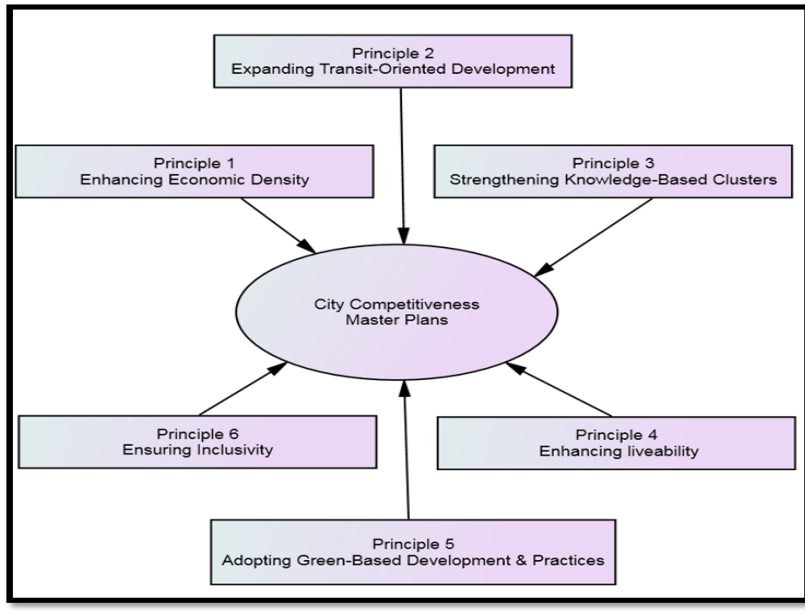
In order to determine the perception of urban community on the challenges faced in Malaysia, the study used data from Global Attitudes Survey (Pew Research Center, 2014). The Global Attitudes Survey sample for Malaysia was divided based on state and urban areas. This stratification allowed for extraction of data of urban dwellers. The present study focused on four states in Malaysia, namely Kuala Lumpur, Selangor, Penang and Malacca. These states were selected as more than 90% of their population live in urban areas (Department of Statistics Malaysia, n.d.). The sample for this study consisted of 358 respondents representing three main races in Malaysia - Malays (52%), Chinese (36.9%) and Indians (10.9%) who reside in urban areas in Malacca (24), Penang (59), Selangor (201) and Kuala Lumpur (74). A profile analysis of the sample showed female (188) outnumbered their male counterparts. The majority (21.2%) of respondents are between 35 and 44 years of age and have completed secondary education (65.1%). Most of the respondents are gainfully employed (62.3%) with the majority (64.8%) falling in the monthly income bracket of between RM1000 to RM5000.

3.2 Framework of analysis

The constraint of using data from a public domain instead of from a customised questionnaire is pick and choose questions that would be able to reflect and capture the objectives of the study. This concern was

addressed by mapping questions from the Global Attitudes Survey with the six key principles identified under the CCMP framework (Figure 3).

Figure 3: CCMP framework as Outlined in the Eleventh Malaysia Plan



Source: Economic Planning Unit, 2015

Table 1: Mapping Questions from the Global Attitude Survey to Principles in the CCMP

Principle	Concerns of CCMP	Item	Urban Challenge
Principle 1: enhancing economic density	Improve productivity and provide job opportunities by attracting investment and trade opportunities	Q23B. Do you think lack of employment opportunities is a very big problem, a moderately big problem, a small problem or not a problem at all in our country?	Lack of Employment Opportunities
Principle 2: Expanding transit-oriented development	Less use of public transport and uncontrolled automobile sprawl	Q21E. Please tell me if air pollution is a very big problem, a moderately big problem, a small problem or not a problem at all. Q21I. Please tell me if traffic is a very big problem, a moderately big problem, a small problem or not a problem at all.	Air Pollution Traffic Congestion
Principle 3: Strengthening knowledge-based clusters	Current industries are predominantly labour and space-intensive	NO MATCHING QUESTIONS	

Table 1: (Continue)

Principle	Concerns of CCMP	Item	Urban Challenge
Principle 4: Enhancing liveability	Lack of affordable and quality living environment	Q21C. Please tell me if poor quality of schools is a very big problem, a moderately big problem, a small problem or not a problem at all.	Poor Quality of Schools
		Q21H. Please tell me if health care is a very big problem, a moderately big problem, a small problem or not a problem at all.	Poor Health Care
		Q23A. Do you think rising prices is a very big problem, a moderately big problem, a small problem or not a problem at all in our country?	Rising Price
Principle 5: Adopting green-based development and practices	Inefficient waste management and concerns with environmental degradation	Q21F. Please tell me if water pollution is a very big problem, a moderately big problem, a small problem or not a problem at all.	Water Pollution
		Q21G. Please tell me if safety of food is a very big problem, a moderately big problem, a small problem or not a problem at all.	Food Safety
Principle 6: Ensuring inclusivity	Concerns on lack of wealth sharing resulting in homelessness and poverty in cities.	Q21A. Please tell me if you think crime is a very big problem, a moderately big problem, a small problem or not a problem at all.	Crime
		Q23C. Do you think the gap between the rich and the poor is a very big problem, a moderately big problem, a small problem or not a problem at all in our country?	Income Inequality

Source: Spring 2014 Global Attitudes Survey, Pew Research Center.

Table 1 shows a mapping of the questions from the Global Attitude Survey to the principles in the CCMP framework. For the first principle of enhance economic density which would lead to creation of more jobs within a given radius (Baker and Lee, 2015) and results in higher economic development (Wang, He and Lin, 2018), the question on the importance of availability or lack of employment opportunities as a potential question was flagged. For the second principle on expanding transit-oriented development which looks at increasing use of public transportation to address the concerns on traffic congestions and air pollution, the question was whether traffic and air pollution are perceived as serious problems. The third principle is on strengthening knowledge-based clusters, however, questions that can be mapped to this construct were not identified. For the fourth principle of enhancing liveability, the questions included are on the perceived quality of education and health care in Malaysia. In order to measure affordable housing, we identified rising price level as a potential

question. For the fifth principle on environmental issues, the questions included are on concerns regarding water pollution and food safety. The final principle is on inclusivity, where concerns were rising on crime attributed to distribution of wealth and inequality in income. The questions included under this category are perceptions on crime and income inequality.

3.3 The scoring method: Relative importance

The study employed RII method to determine the relative importance of the various challenges faced by urban community in Malaysia. This technique is widely used in the construction management research (Kometa, Olomolaiye & Harris, 1994; Sambasivan & Soon, 2007; Gündüz, Nielsen & Özdemir, 2013). The questions identified for inclusion in the analysis had a four-point scale which were initially coded as ranging from 1 (very big problem) to 4 (not a problem at all). However, the responses were recoded to range from 1 (not a problem) to 4 (a very big problem) for the purpose of better reflecting the importance of each challenge as per the relative importance index approach. The responses from these questions are transformed to relative importance indices (RII) by applying the calculation as shown in equation 1.

$$RII = \frac{\Sigma W}{A*N} \qquad \textbf{(1)}$$

where W is the weighting given to each factor by respondents ranging from either (1 to 4); A is the highest weight, where in this case it takes on a value of 4; and N is the total number of respondents. The weightage is the same for all questions as it is based on the Likert scale of 1 to 4. The RII value has a range of 0 to 1, where the higher the value, the more important is that challenge as perceived by the urban community.

4. Empirical Results

The RII was tabulated and a ranking of the challenges was done based on the RII values. Table 2 shows the RII value and ranking for the urban areas in the four states considered in this study. Based on the ranking as shown in Table 2, the five most important challenges as perceived by the urban community were: (1) crime (RII = 0.935); (2) Rising Price Level (RII = 0.931); (3) Lack of Employment Opportunities (RII = 0.869); (4) Air Pollution (RII = 0.844) and (5) Traffic Congestion (RII = 0.817). In order to gauge the perception of urban community in the respective states, the RII

values were computed for the challenges and the top five challenges were ranked for the four states (Table 3).

The five most important challenges as perceived by urban community in Kuala Lumpur were crime (1), rising price level (2), traffic congestion (3), lack of employment opportunities (4) and air pollution (5). The five most important challenges as perceived by urban community in Selangor were crime (1), rising price level (2), lack of employment opportunities (3), air pollution (4) and traffic congestion (5). The five most important challenges as perceived by urban community in Penang were crime and rising price level as the most important challenge, income inequality (3), poor quality of schools (4) and food safety hazards (5). Finally, the five most important challenges as perceived by urban community in Malacca were rising price level (1), crime (2), lack of employment opportunities (3), income inequality (4) and water pollution (5).

Table 2: Ranking of Challenges (Overall)

Challenges	**Percentage of respondents scoring**				**RII**	**Rank**
	1	**2**	**3**	**4**		
Crime	0.0	1.1	23.7	75.1	0.935	1
Rising Price Level	0.3	3.1	20.7	76.0	0.931	2
Lack of Employment Opportunities	1.7	9.3	28.9	60.1	0.869	3
Air Pollution	1.7	12.0	33.2	53.1	0.844	4
Traffic Congestion	3.4	11.2	40.8	44.7	0.817	5
Income Inequality	6.7	12.3	31.0	50.0	0.811	6
Water Pollution	2.5	12.0	46.6	38.8	0.804	7
Poor Quality of Schools	5.0	19.3	33.1	42.6	0.783	8
Food Safety Hazards	5.3	21.6	34.8	38.2	0.765	9
Poor Health Care	7.6	18.2	35.0	39.2	0.765	10

Table 3: Ranking of the Top Five Challenges by State

	Biggest Challenge	**2nd**	**3rd**	**4th**	**5th**
Kuala Lumpur	Crime	Rising Price Level	Traffic Congestion	Lack of Employment Opportunities	Air Pollution
Selangor	Crime	Rising Price Level	Lack of Employment Opportunities	Air Pollution	Traffic Congestion
Penang	Crime and Rising Price Level	-	Income Inequality	Poor Quality of Schools	Food Safety Hazards
Malacca	Rising Price Level	Crime	Lack of Employment Opportunities	Income Inequality	Water Pollution

In order to establish the importance of the strategies structured in the CCMP framework as perceived by the urban community, the average RIIs of the challenges were computed to derive the RIIs for the principles as shown in Table 4. The overall RII value indicates the urban communities identified principle 6, ensuring inclusivity (RII = 0.873) as the most important of the six strategies prioritised by the Government under the CCMP framework. A breakdown by states shows that urban communities in Malacca and Penang identified ensuring inclusivity, as the most important principle. The second most important principle based on the overall RII value was enhancing economic density (RII = 0.869). An analysis by states shows that urban community in Selangor (RII = 0.873), Malacca (RII = 0.932) and Kuala Lumpur (RII =0.848) perceived enhancing economic density as the most important principle. However, the urban community in Penang ranked principle 4, enhancing liveability (RII=0.894), as the second most important principle that needs to be addressed under the CCMP framework.

Table 4: Mean RII and Ranking of CCMP Principles linked to Challenges

Principles	Selangor		Melaka		Penang		Kuala Lumpur		Overall	
	RII	**Rank**	**RII**	**Rank**	**RII**	**Rank**	**RII**	**Rank**	**RII**	**Rank**
Principle 1	0.873	1	0.932	1	0.856	3	0.848	1	0.869	2
Principle 2	0.836	3	0.729	5	0.837	5	0.843	3	0.831	3
Principle 4	0.814	4	0.809	3	0.894	2	0.810	4	0.826	4
Principle 5	0.771	5	0.776	4	0.838	4	0.784	5	0.785	5
Principle 6	0.872	2	0.932	1	0.924	1	0.845	2	0.873	1

Note: Principle 1 (Enhancing economic density), Principle 2 (Expanding transit-oriented development), Principle 4 (Enhancing liveability), Principle 5 (Adopting green-based development and practices), Principle 6 (Ensuring inclusivity)

5. Discussion

The main objective of this study was to determine whether the policies and strategies employed by the Government successfully tackled the issues considered as important by the urban community. The empirical results identified five main challenges. The urban community in Malaysia wants a safe living environment (Crime), where they will be able to secure employment (Lack of Employment Opportunities) that would provide them with sufficient spending power (Rising Price Level). In addition, they aspire for a good public transportation system (Traffic Congestion) that that can reduce CO2 emission (Air Pollution). Having identified the key indicators of urban community, the subsequent discussion focuses on whether the policy measures are aligned to what the urban society perceives as important.

The Government had prioritised six principles under the CCMP framework. Each principle was given due consideration and focus in the Eleventh Malaysian Plan (Economic Planning Unit, 2015), but no indication was given whether one principle was more important compared with the other. In the absences of clear indication of importance, the listing of principles in CCMP framework was used as an expression of priority. Based on Table 4, the key priority of the urban community is social inclusiveness and integration; however, in the CCMP framework, this is listed as the sixth or last principle. This indicates that what is perceived as the biggest challenge by the urban community is given the least importance by policy makers. This also highlights the importance of consulting and engaging with civil society in designing policies on urban liveability. Inputs from the urban community would ensure that important challenges perceived by the urban community are addressed by policy makers.

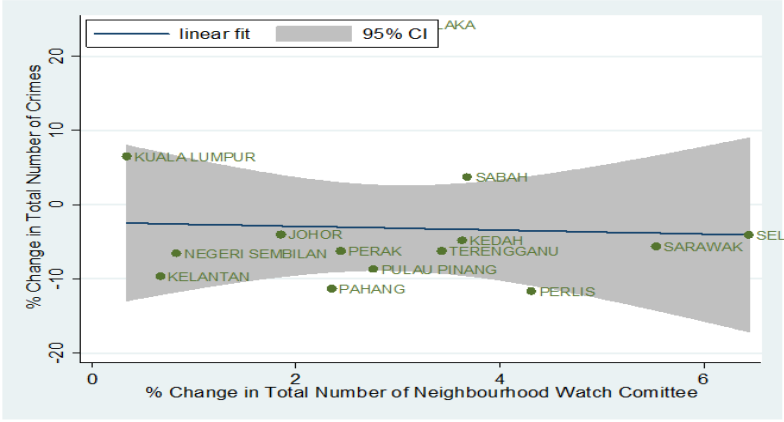
The present study acknowledges that taking the listing of the principles as an indication of priority is not the best approach. An alternative is to look at some of the measures implemented by the Government to see if they addressed the key challenges of the urban community. On top on the list of what is most desired by urban society is a safe living environment. Table 2 highlights crime as the biggest concern. Studies highlight factors, such as economic conditions (Habibullah & Baharom, 2009), inflation rate and unemployment rate (Tang, 2009) as contributing towards rising crime rates in Malaysia. A quick glance at the local media provides ample anecdotes on the perils of crime and criminals in Malaysia, giving the impression of rising crime rates.

In exploring whether there was sufficient focus by policy makers towards crime prevention, the Eleventh Malaysia plan identified specific strategies for crime reduction which includes among others, increasing the presence of police force, focusing on rehabilitation measures and promoting crime awareness among the high-risk groups (Economic Planning Unit, 2015). In addition, initiatives were taken to establish Neighbourhood Watch Committee programmes to enhance social integration, monitoring issues of social conflicts and reporting it to the relevant authorities; and organising night patrol to reduce incidences of crime in the neighbourhood (Department of National Unity and Integration, n.d.). In order to determine if Neighbourhood Watch Committee is effective in crime prevention, Figure 4 shows a negative relationship between Neighbourhood Watch Committees and percentage of total number of crimes between 2015 and 2016 for the 14 states in Malaysia. Based on Figure 4, Neighbourhood Watch Committees have an impact on reducing crime rates but it is not as significant. This indicates the effectiveness of Neighbourhood Watch Committees can be improved. It can be concluded there is a concerted effort on the part of policy makers to

ensure a safe living environment for the urban community based on the latter's expectation.

Another key concern of urban society is rising price level, where this component is ranked second by the overall community, as well as the urbanites in Kuala Lumpur, Selangor and Penang, while the community in Malacca ranked this as their biggest concern. Rising price level impacts standard of living and the purchasing power of communities. The Government is cognisant of the need to improve the standard of living as outlined in the Eleventh Malaysia Plan where households are divided in three broad categories of T20 (Top 20% households income group), M40 (Middle 40% households income group) and the B40 (Bottom 40% households income group) where those categorised as falling under B40 are those with a median monthly income of RM3, 000 (Department of Statistics Malaysia, 2017). The study computed the median monthly income for the 358 respondents in this sample and derived a value of RM2, 500, indicating that a significant proportion of the respondents can be grouped under the B40 category. Specific measures are included in the Eleventh Malaysia Plan to uplift the standard of living of those grouped under the B40 category, which included among others increasing the level of education and skill sets as well creating entrepreneurial opportunities with the aim of increasing income and reducing dependence on government assistance. Here too, there is an alignment between the preferences revealed by the urban community and the policy directions of the Government. However, the policy support is skewed towards B40 group where there is a danger of neglecting the views of the M40 household income group.

Figure 4: Effectiveness of Neighbourhood Watch Committees on Crime Prevention among 14 States in Malaysia, 2016



Source: The Public Sector Open Data Portal; Department of National Unity and Integration

6. Conclusion

The purpose of this study was to evaluate the challenges faced by the urban community in Malaysia and whether Government policies were successful in addressing these concerns. The challenges based on the perspective of the urban communities were rising crime rates, lack of employment opportunities, air pollution and traffic congestion. The study established policy that measures implemented by the Government were in sync with the concerns revealed by the urban community. However, it would be ideal if the urban community was given an opportunity to participate and provide inputs in designing policies on urban liveability. As data employed by this study was extracted from the public domain, the third principle of CCMP framework could not be analysed. Thus, it is recommended future research design specific survey questions that would be able to capture the finer details on the challenges of urban living.

Acknowledgement

This research was funded by Taylor's University Research Grant: The Economics of Liveable and Sustainable Cities in the Greater Kuala Lumpur and Klang Valley.

References

Aaltonen, M., Kivivuori, J. & Martikainen, P. (2011) 'Social determinants of crime in a welfare state: do they still matter?', *Acta Sociologica*, *54*(2), 161–181.

Akil, A. M., Foziah, J. & Ho, C. S. (2015) 'the effects of socio-economic influences on households recycling behaviour in Iskandar Malaysia', *Procedia - Social and Behavioral Sciences*, *202*, 124–134.

Baker, J. & Lee, M. (2015). *Achieving a system of competitive cities in Malaysia*. Putrajaya: Economic Planning Unit, Prime Minister's Department, Malaysia, p.192.Retrieved Febuary 9, 2018, from http://documents.worldbank.org/curated/en/709061475743434007/Main-report.

Balducci, A. & Checchi, D. (2009) 'Happiness and quality of city life: the case of milan, the richest Italian city', *International Planning Studies*, *14*(1), 25–64.

Bardhan, R., Kurisu, K. & Hanaki, K. (2015) 'Does compact urban forms relate to good quality of life in high density cities of India? case of Kolkata', *Cities*, *48*, 55–65.

Bruun, K. (2016) 'Problematising internal security: crime, community and social exclusion', *Cogent Social Sciences*. Edited by J. Halsall, *2*(1), 1–14.

Cambir, A. & Vasile, V. (2015) 'Material dimension of life quality and social inclusion', *Procedia Economics and Finance*, *32*, 932–939.

Carpenter, J. (2006) 'Addressing Europe's urban challenges: lessons from the EU urban community initiative', *Urban Studies*, *43*(12), 2145–2162.

Chu, E. K. (2017) 'Urban climate adaptation and the reshaping of state–society relations: the politics of community knowledge and mobilisation in Indore, India', *Urban Studies*, *55*(8), 1766–1782.

Corburn, J. (2004) 'Confronting the challenges in reconnecting urban planning and public health', *American Journal of Public Health*, *94*(4), 541–546.

Department of National Unity and Integration (n.d.) *Neighbourhood watch (RT)*. Retrieved from https://www.perpaduan.gov.my/en/community/neighbourhood-watch-rt.

Department of Statistics Malaysia (2017). *Report of household income and basic amenities survey 2016*. Retrieved from https://www.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=RUZ5REwveU1ra1hGL21JWVlPRmU2Zz09.

Department of Statistics Malaysia (n.d.). *eStatistik*. Retrieved from https://newss.statistics.gov.my/newss-portalx/ep/epLogin .seam.

Economic Planning Unit (2015). *Eleventh Malaysia plan 2016-2020: anchoring growth on people*. Putrajaya: Economic Planning Unit, Prime Minister's Department, Malaysia, p.370. Retrieved from https://www.talentcorp.com.my/clients/TalentCorp_20 16_7A6571AE-D9D0-4175-B35D99EC514F2D24/contentms/img/publication/RMK e-11Book.pdf.

Economic Planning Unit (2017). *Malaysia-sustainable development goals voluntary national review 2017: high-level political forum*. Putrajaya: Economic Planning Unit, Prime Minister's Department, Malaysia, p.82. Retrieved from https://sustainabledevelopment.un.org/content/documents/15881Malaysia.pdf.

Evers, H. & Gerke, S. (2015). Knowledge cluster formation as a science policy in Malaysia: lessons learned. *Journal of Current Southeast Asian Affairs*,*34*(1), 115–137. Retrieved from http://www.CurrentSoutheastAsianAffairs.org.

Faria, J. R., Ogura, L. M. and Sachsida, A. (2013) 'Crime in a planned city: the case of Brasília', *Cities*, 32, pp. 80–87.

Federal Department of Town and Country Planning (2006). *National urbanisation policy*.Kuala Lumpur: Jabatan Perancangan Bandar dan Desa, p.108. Retrieved from http://urban lex.unhabitat.org/sites/def

ault/files/ms_nup_national_urbanisation_policy_2006.pdf.

Federal Department of Town and Country Planning (2016). *Malaysia national report for the 3rd United Nations conference on housing and sustainable urban development (habitat III)*.Putrajaya: Ministry of Urban Wellbeing, Housing and Local Government, p.97. Retrieved from http://habitat3.org/wp-content/uplo ads/Malaysia-National-Rep ort-28092016.pdf.

Federal Department of Town and Country Planning Peninsular Malaysia. (n.d.). *MURNInets© | Malaysian urban rural national indicators network on sustainable development*. Retrieved from http://murnin et.townplan.gov.my/murninetsv2/mys/page/objektifmurninets.

Gavrilidis, A. A., Ciocănea, C. M., Niţă, M. R., Onose, D. A. & Năstase, I. I. (2016) 'Urban landscape quality index – planning tool for evaluating urban landscapes and improving the quality of life', *Procedia Environmental Sciences*, *32*, 155–167.

Giap, T. K., Thye, W. W. & Aw, G. (2014) 'A new approach to measuring the liveability of cities: the global liveable cities index', *World Review of Science, Technology and Sustainable Development*, *11*(2), 176.

Glaeser, E. & Gottlieb, J. (2009) *The wealth of cities: agglomeration economies and spatial equilibrium in the United States*. Cambridge, MA.

Gündüz, M., Nielsen, Y. and Özdemir, M. (2013) 'Quantification of delay factors using the relative importance index method for construction projects in Turkey', *Journal of Management in Engineering*, 29(2), pp. 133–139.

Habibullah, M. S. & Baharom, A. H. (2009) 'Crime and economic conditions in Malaysia', *International Journal of Social Economics*, *36*(11), 1071–1081.

Hwang, E. & Ziebarth, A. (2015) 'Walkability features for seniors in two livable communities: a case study', *Housing and Society*, *42*(3), 207–221.

Joffe, H. & Smith, N. (2016) 'City dweller aspirations for cities of the future: how do environmental and personal wellbeing feature?', *Cities*, 59, 102–112.

Khazanah Research Institute (2015). *Making housing affordable*.Kuala Lumpur: Khazanah Research Institute, p.134. Retrieved from http://www.krinstitute.org/assets/contentMS/img/template/editor/_FIN AL_Full_Draft__KRI__Making_Housing_Affordable__with_hyperlin k__220815%20(1).pdf.

Kometa, S. T., Olomolaiye, P. O. & Harris, F. C. (1994) 'Attributes of UK construction clients influencing project consultants' performance', *Construction Management and Economics*, *12*(5), 433–443.

Lee, J.H., Wu, C.F., Hoek, G., de Hoogh, K., Beelen, R., Brunekreef, B. &

Chan, C.-C. (2014) 'Land use regression models for estimating individual NOx and NO2 exposures in a metropolis with a high density of traffic roads and population', *Science of The Total Environment*, *472*, 1163–1171.

Loh, C. G. (2012) 'Four potential disconnects in the community planning process', *Journal of Planning Education and Research*, *32*(1), 33–47.

Manaf, L. A., Samah, M. A. A. & Zukki, N. I. M. (2009) 'Municipal solid waste management in Malaysia: practices and challenges', *Waste Management*, *29*(11), 2902–2906.

Moh, Y. & Abd Manaf, L. (2014) 'Overview of household solid waste recycling policy status and challenges in Malaysia', *Resources, Conservation and Recycling*, *82*, 50–61.

Moh, Y. & Abd Manaf, L. (2017) 'Solid waste management transformation and future challenges of source separation and recycling practice in Malaysia', *Resources, Conservation and Recycling*, 116, 1–14.

Mostafa, A. M. (2012) 'Quality of life indicators in value urban areas: Kasr Elnile Street in Cairo', *Procedia - Social and Behavioral Sciences*, *50*, 254–270.

Pew Research Center (2014) 'Spring 2014 global attitudes survey'. Pew Research Center. Retrieved, from http://www.pewglobal.org/dataset/2014-spring-global-attitudes.

Ruth, M. & Franklin, R. S. (2014) 'Livability for all? conceptual limits and practical implications', *Applied Geography*, *49*, 18–23.

Sambasivan, M. & Soon, Y. W. (2007) 'Causes and effects of delays in Malaysian construction industry', *International Journal of Project Management*, *25*(5), 517–526.

Sanders, P., Zuidgeest, M. & Geurs, K. (2015) 'Liveable streets in Hanoi: a principal component analysis', *Habitat International*, *49*, 547–558.

Serag El Din, H., Shalaby, A., Farouh, H. E. & Elariane, S. A. (2013) 'Principles of urban quality of life for a neighborhood', *HBRC Journal*, *9*(1), pp. 86–92.

Shamsuddin, S. & Rashid, A. (2013). Malaysian urban rural national indicators network on sustainable development (MURNInets). In: *measuring sustainability and urban form across cities*. California: 43rd Annual conference of the urban affairs association, pp.1 -13. Retrieved from https://s3.amazonaws.com/academia.edu.documents/31172747/murninets_edited_21_mac_2013pdf?awsaccesskeyid=akiaiwowyygz2y53ul3a&expires=1534312552&signature=4gy%2bnvaukfdkn9n7cg9emsjmqxu%3d&responsecontentdisposition=inline%3b%20filename%3dmalaysian_urban_rural_national_indicator.pdf.

Shekarrizfard, M., Faghih-Imani, A. and Hatzopoulou, M. (2016) 'An examination of population exposure to traffic related air pollution: comparing spatially and temporally resolved estimates against long-

term average exposures at the home location', *Environmental Research*, *147*, 435–444.

Shekarrizfard, M., Valois, M.-F., Goldberg, M. S., Crouse, D., Ross, N., Parent, M.-E., Yasmin, S. & Hatzopoulou, M. (2015) 'Investigating the role of transportation models in epidemiologic studies of traffic related air pollution and health effects', *Environmental Research*, *140*, 282–291.

Stegman, M. A. (1995) 'Recent US urban change and policy initiatives', *Urban Studies*, *32*(10), pp. 1601–1607.

Szołtysek, J. and Otręba, R. (2016) 'Determinants of quality of life in building city green mobility concept', *Transportation Research Procedia*, *16*, 498–509.

Tang, C. F. (2009) 'The linkages among inflation, unemployment and crime rates in Malaysia', *International Journal of Economics and Management*, *3*(1), 50–61. Retrieved from https://p dfs.semanticsc holar.org/1402/57a9bee42fba9c9aa49c3b7e200027b7b85b.pdf.

TomTom International BV (2016). *TomTom traffic index - Kuala Lumpur*. Retrieved from https://www.tomtom.com/en_gb /trafficindex/city/ku ala-lumpur.

Viglia, S., Civitillo, D. F., Cacciapuoti, G. & Ulgiati, S. (2017) 'Indicators of environmental loading and sustainability of urban systems. an emergy-based environmental footprint', *Ecological Indicators*.

Vincent, J. M. (2006) 'Public schools as public infrastructure', *Journal of Planning Education and Research*, *25*(4), 433–437.

Wang, J., He, T. & Lin, Y. (2018) 'Changes in ecological, agricultural and urban land space in 1984–2012 in China: land policies and regional social-economical drivers', *Habitat International*, 71, pp. 1–13.

Zain, S. M., Basri, N. E. A., Basri, H., Zakaria, N., Elfithri, R., Ahmad, M., Ghee, T. K., Shahudin, Z., Yaakub, S. & Khan, I. A. I. (2012) 'Focusing on recycling practice to promote sustainable behavior', *Procedia - Social and Behavioral Sciences*, *60*, 546–555.

Zhu, J. (2017) 'Making urbanisation compact and equal: integrating rural villages into urban communities in Kunshan, China', *Urban Studies*, *54*(10), 2268–2284.

Institutions and Economies
Vol. 10, No. 4, October 2018, pp. 91 - 108

Trade and Investment Convergence Clubs in East Asia Pacific

Sonia Kumari Selvarajan[a] , Rossazana Ab-Rahim[b] & Nor-Ghani Md-Nor[c]

Abstract: *East Asia Pacific has catapulted to be the most dynamic region in the world as a result of economic liberalisation and sustainable growth. This study seeks to investigate if selected East Asian countries are able to converge in terms of trade and investment openness. This paper uses the concept of Phillips and Sul to evaluate trade and investment convergence in East Asia Pacific region during the period 1990 to 2016. The overall results do not support the hypothesis that all countries converge on a single equilibrium in trade and investment liberalisation. However, findings point to the existence of club convergence.*

Keywords: Convergence Club, Catch-up Effect, East Asia Pacific, Trade Openness
JEL Classification: F13, O16, O53

Article Received: 14 March 2018; Article Accepted: 28 August 2018

1. Introduction

The resilience of East Asia Pacific through its strong economic performance coupled with its increasing integration of trade and investment has resulted in the region emerging as an important player in the global arena. East Asia Pacific integrations differ from Europe and North America because the market is driven naturally in the absence of a formal institutional framework (Zhang, 2001). Zhang added there is an apparent trend that is created by international firms, paving the way for an outward trade and foreign direct investment (FDI) relationship in the region. China, Japan, South Korea and Indonesia are among the top 20 countries in terms of their Gross Domestic Product (GDP) growth (International Monetary Fund, 2014). The East Asia Pacific region generally adopts an export-oriented strategy, resulting in a progressive increase of foreign trade, from 6 percent in 1953 to 28 percent in 2006 (Kang, 2009). By 2005, share of its trade to GDP rose to 47% in East

[a] Department of Development Studies, Faculty of Economics and Administration, University of Malaya, 50603, Kuala Lumpur, Malaysia. *Email: soniakumari@um.edu.my*
[b] Corresponding author. Faculty of Economics and Business, Universiti Malaysia Sarawak, 94300, Sarawak, Malaysia. *Email: rossazana@gmail.com*
[c] Faculty of Economics and Management, Universiti Kebangsaan Malaysia, 43600, Bangi, Malaysia. *Email: norghani@ukm.edu.my*

Asia and Asia Pacific, owing to the increase in trade agreements within and between regions (World Bank, 2008). Further integration, which promises free flow of goods and services across borders, is essential to maintain this growth rate (Asian Development Bank, 2013). The existence of trade agreements, such as the APT (ASEAN plus Three), ASEAN Free Trade Area (AFTA) and Asia-Pacific Trade Agreement (APTA), implies that East Asian Pacific countries are pursuing economic liberalisation (Wong, 2005; Soukhakian, 2007; Bashar et al., 2008).

The transition to a liberalised nation requires countries to adopt outward-oriented strategies alongside the need for financial and trade sector reform. The variances in development path of East Asia Pacific countries pose a key challenge – despite gap narrowing initiatives such as Initiative for ASEAN Integration (IAI). It is ambiguous if liberalisation would benefit all countries. Countries' stability is often put to the test with the sudden investment in the region. Furthermore, the "noodle bowl" problem, whereby bilateral trade agreements with diverse content complicates the East Asia Pacific trading system (Wilson, 2015; Selvarajan & Ab-Rahim, 2017). Despite these concerns, liberalisation provides impetus for countries to develop, as the process enables developing countries with low labour cost to attract FDI. This allows for developing economies to grow rapidly and catch up with high-income countries.

Through the effects of globalisation, the growth of low and middle-income countries has accelerated to the point that it is possible for them to converge with high-income countries (Barro & Sala-i-Martin, 1991). The neoclassical growth theory built on the foundational work of Solow (1956), Swan (1956), Cass (1965) and Koopmans (1965) implies that countries should eventually converge as it integrates economic structures, such as population growth rates, savings rates and depreciation rates. Past studies have pursued different methods to enhance the structure of the simple Solow-Swan model. Growth theories postulated by Azariadis and Drazen (1990) and Galor (1996) showed countries with similar features, such as trade strategies and government policies, might converge to diverse steady-state equilibrium even if conditions differ in the beginning. This phenomenon is widely referred to as the club convergence hypothesis (Quah, 1993; Galor, 1996). This stream of studies adopted an advanced approach and suggests countries or regions form sub-groups around poles of attraction in the long run (Ben-David, 1993; Bernard & Durlaud, 1995; Quah, 1996).

Durlauf and Johnson (1995) and Phillips and Sul (2007), support the theories of convergence clubs, that is, there is no global convergence, but countries may converge to a similar group or pattern (Galor, 1996). Although limited, recent studies offer evidence of trade and investment convergence. Investment convergence establishes cohesion in the region for future collaboration and policy making. Ballinger et al. (2016) showed investment

convergence among 18 United State (US) regions, while Choi (2004) postulated that FDI is a driving force of convergence in the Organisation for Economic Co-operation and Development (OECD). Ibrahim and Habibullah (2013) showed Malaysia to be financially converging towards its richer counterparts in Asia Pacific Economic Cooperation (APEC). Regional trade integration allows its members to benefit in terms of market exposure while improving their efficiency. Several studies found evidence of convergence of trade, where lower income countries were able to catch-up with richer members (Belshaw, 2005; Cyrus, 2004; Apergis & Cooray, 2016). For instance, Belshaw (2005) reported that trade activities promote convergence in Africa, while Cyrus (2004) asserted that trade openness contributes to narrowing the income gap among.

Phillips and Sul (2009) added that while some regions have similar structures over time, others may diverge for certain periods and converge in others. Nevertheless, Bandyopadhyay (2011) suggested caution; the persistent disparities in income across countries may lead to widespread disparities in welfare and are often the cause of social and political tension. In line with the rapid pace of economic growth that developing countries have experienced in the past 10 years, the investigation on convergence is continuously increasing (Rodrik, 2011). As far as this study is concerned, it is the first to investigate trade and investment convergence clubs in East Asia Pacific region. The remainder of this study is organised as follows. The next section offers the theoretical motivation as well as empirical evidence concerning the issues of convergence, followed by a discussion on data and methodology. The subsequent section presents the empirical results, while the last section concludes the paper and presents directions for future research.

2. Literature Review

The neoclassical model by Solow (1956) and Swan (1956) incorporated economic growth theories based on endogenous growth models in the mid-1980s. By adopting various equations, the model is able to capture the dynamic impact of capital accumulation. The Solow-Swan model can be used to indicate if the gap between economic growth rates in countries is moving closer, i.e., converging or diverging. The findings of the model indicated that economies of countries converge to a steady state.

Over the past few decades, theoretical insights on the topic of convergence have caused a debate over the mixed results obtained in previous literature. The Solow model predicts conditional convergence whereby poorer countries would grow faster than richer countries if these countries can control the determinants of their income level. On the other

hand, Romer (1986) argued a theoretical growth model with increasing returns to scale, production technology may result in a propensity for rich countries to increase their dominance over poorer countries. Convergence is defined as the catching up of relatively low-income countries with high-income countries (Barro & Sala-i-Martin, 1991).

Past studies found sub-groups of countries show similar GDP patterns in the long run (Ben-David, 1993; Quah, 1997; Durlauf & Johnson, 1995) and offer support for the theory of convergence clubs (Baumol, 1986; Galor, 1996). Although there is no global convergence, countries with similar GDP patterns form a group. Club convergence is defined when income per capita of countries is identical in structural characteristics (technologies, rates of population growth, preferences, government policies, among others) converge to one another in the long run given their identical initial conditions (Galor, 1996). Baumol et al. (1994) suggested that a convergence club consists of countries to which convergence applies, while countries outside this club will not necessarily experience convergence. While some countries or regions are found to have similar GDP structures across time, others point to a diverging GDP level for a certain period and show convergence for other time periods (Phillips & Sul, 2009).

Phillips and Sul (2007) proposed a new econometric approach for testing the convergence hypothesis and the identification of convergence clubs. They extended the neoclassical growth models to allow for heterogeneity in the growth rate of technological progress across countries and over time. Econometric problems with the broadly used Solow regression relate to endogeneity and omitted variable bias, a result of transitional heterogeneity (Phillips & Sul, 2009). Therefore, Phillips and Sul adopted a nonlinear time-varying factor model which encompasses of a framework for modelling transitional dynamics and long run behavior. This method has been widely used in recent studies (Apergis, Christou & Miller, 2012; Bartkowska & Riedl, 2012; Cuestas et al., 2013) as it allows a broad spectrum of transitional behaviour to be endogenously revealed among economies, such as convergence to a common steady state, divergence and club convergence.

A number of studies have studied trade convergence (Cyrus, 2004; Liu, 2009; Cristobal-Campoamor & Parcero, 2013). However, the results are mixed. Ben-David (1993; 1996) showed liberalisation creates convergence among countries through the elimination of trade barriers and increased trade volumes. Based on a bilateral trade panel data analysis, Cyrus (2004) found evidence of trade-induced convergence, while Liu (2009) examined the relationship between trade and income convergence in 165 countries and found reverse causality from income convergence to trade. Cristobal-Campoamor and Parcero (2013) analysed trade liberalisation and convergence in Eastern Europe from 1990-2005 and their findings showed during the first half of the period, liberalisation led to divergence of GDP per

capita. However, the process reversed during the second half of the period. Slaughter (2001) found no relationship between trade liberalisation and convergence. In the Asian region, a growing number of studies has analysed convergence (Liew & Lim, 2005; Liew & Ahmad, 2006; Wang, 2012; Song et al. 2013). Parikh and Shibata (2003) examined impacts of trade liberalisation on convergence in income per capita of the African, Asian and Latin American regions and concluded that there is no evidence of beta-convergence in Asian countries; however, sigma convergence is found in the region. Islam and Chowdhury (1997) were among the first scholars to examine convergence in the Asia-Pacific region and their findings showed a significant rise in the intra-regional trade among East Asian countries after 1985, stressing that integration should be market driven and not politically influenced.

Most studies have focused on the link of convergence and trade liberalisation and studies of convergence and investment liberalisation appear to be limited (Escot & Galindo, 2000; Eicher & Hull, 2010). Escot and Galindo (2000) found due to free capital mobility, there is an appearance of convergence in interest rates indicating convergence in income level among countries of the same degree. Eicher and Hull (2010) investigated capital flow reversals caused by investment liberalisation and their effects on the convergence speed of OECD countries. Their findings suggested that investment liberalisation reduces short run convergence speed, indicating a more open economy experiences less output volatility. On the contrary, Oman (2000) observed that countries are racing to the bottom rather than the top, as there are growing concerns about protectionism, environmental and labour standards, due to the increase in FDI which could result in market distortions. Behrens and Murata (2012) and Abd-Karim (2005) urged the government to enhance coordination between trade and FDI policy, as convergence in openness allows for countries with different sectoral compositions to benefit from positive spill overs of international trade. Apergis and Cooray (2015) showed the formation of convergence clubs based on the stages of development and policies to promote trade and FDI convergence allow countries to benefit from mutual interactions. Hence, the authors added through an effective trade regime, countries are permitted to benefit from openness, thus leading to a race to the top rather than the bottom.

This study is different from previous ones in that it adopts the methodology of Phillips and Sul (2007) to study East Asia Pacific countries from 1990 to 2016, aiming to explore the possibility of trade and FDI convergence in club formation.

3. Data and Methodology

3.1 Description of data

The balanced panel dataset of 16 East Asia Pacific countries for the period 1990-2016 was used in the present study. The countries are listed according to United Nations Conference on Trade and Development definition of East Asia Pacific, comprising of China, Hong Kong, Macau, Taiwan, South Korea, Mongolia, Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. The dataset is extracted from the World Development Indicator by the World Bank and United Nations Conference on Trade and Development. The effect of investment openness, denoted by FDI inflow over GDP ratio is utilised in this study. As for the trade openness index, the most commonly used measurement for trade openness is trade shares (TO) – the sum of import and exports over GDP. This measures the disclosure to trade interactions, clearly indicating the level of integration. The above-mentioned variables are most commonly used to measure trade and investment liberalisation in past studies (Bilquess, Mukhtar & Sohail, 2011; Falvey, Foster & Greenaway, 2012; Gehringer, 2012; Kiyota, 2012; Apergis & Cooray, 2015).

3.2 Economic specification

In order to analyse if the pool of countries form clubs of convergence, the Phillips and Sul (2007; 2009) methodology was employed. Based on the method, groups of countries may converge to a steady state which is common to all the countries of the group but different in other groups. This approach is based on a nonlinear and time varying factor model that incorporates the possibility of transitory heterogeneity and transitory divergence. This methodology adopts the time-varying common-factor representation for X_{it} of country i

$$X_{it} = \delta_{it}\mu_t \tag{1}$$

where δ_{it} measures time-varying idiosyncratic distance between common factor μ_t and the systematic parameter of X_{it}. Using this framework, all N economies will convergence at any given point, irrespective of whether the countries are near the steady state.

By modelling the transition parameter δ_{it} , relative measure of the transition coefficient is constructed and shown below (Phillip & Sul, 2007):

$$h_{it} = \frac{X_{it}}{\frac{1}{N}\sum_{i=1}^{N} X_{it}} = \frac{\delta_{it}}{\frac{1}{N}\sum_{i=1}^{N} \delta_{it}} \tag{2}$$

Variable h_{it} is known as the relative transition path and traces the individual trajectory for each i relative to the panel average. h_{it} measures region i's relative departure from the common steady growth μ_t. An existence of a common limiting transition behaviour across regions, then $h_{it} = h_t$ across i and when there is growth convergence, then $h_{it} \to 1$ for all i as $t \to \infty$. Over time, the path of transition is formed, whereby every i can be traced by variable h_{it}. According to Phillips and Sul (2007), in order to evade the initial effort of the base year initialisation, the first eight years of observation are rejected, henceforth, 18 filtered observations are used in the analysis. The Whittaker -Hodrick-Prescott (WHP) smoothing filter is used to smoothen the relative transition parameters for this period. This technical tool is frequently used to separate the cyclical component of a time series from raw data. Using the WHP filter, the cross-sectional averages shown in (2) are computed as:

$$\hat{h}_{it} = \frac{\hat{x_{it}}}{\frac{1}{N}\sum_{i=1}^{N} \hat{x_{it}}} \tag{3}$$

Defining a formal econometric test of convergence as well as an empirical algorithm of defining club convergence requires the following assumption for the semi-parametric form for the time-varying coefficients δ_{it}.

$$\delta_{it} = \delta_i + \sigma_i \xi_{it} L(t)^{-1} t^{-\alpha} \tag{4}$$

where δ_i is fixed $\sigma_i > 0$, ξ_{it} is i.i.d (0,1) across i, but weakly dependent on t[1] *and* L(t) is a slow varying function for which L(t) tends to infinity as t also goes to infinity. L(t) is assumed to be log t. ξ_{it} denotes the time-varying and region-specific components to the model. Size of α determines convergence of divergence of δ_{it}. This formula ensures convergence of the parameter of interest for all $\alpha \geq 0$, which is the null hypothesis since $\delta_{it} = \delta_i$ as $t \to \infty$. If this hypothesis holds and $\delta_i = \delta_j$ for $i \neq j$, the model specified in (3) allows for transitional period for which $\delta_{it} \neq \delta_{jt}$,thus incorporation of the possibility of transitional heterogeneity or even transitional divergence across i.

Phillip and Sul show that the hypothesis can be tested by following the 'log t' regression model:

$$\log\left(\frac{H_1}{H_t}\right) - 2\log(\log(t)) = a + b\log t + u_t \tag{5}$$

where t=[rT], [rT]+1, T with r >0. Based on simulation experiments, Phillips and Sul (2007) suggest r = 0.3.

The parameter b is related with α. The fitted value of log t is $\hat{b} = 2\hat{\alpha}$ where $\hat{\alpha}$ is the estimated value of α under the null hypothesis. Within the method, the rejection of null hypothesis for the whole panel does not mean that there is no convergence, since it is possible to test for club of convergence. Thus, the investigation for convergence for different group of countries and identification commonalities within a panel of countries is possible.

The regression model (5) has three stages. Firstly, cross-sectional variance ratio H_1/H_t is constructed, followed by the conventional robust t statistic $t_{\hat{b}}$ for the coefficient $\hat{b}$. Next, autocorrelation and heteroscedasticity robustness one side t test of the inequality null hypothesis $\alpha \geq 0$ is applied with the estimated coefficient $\hat{b}$. The null hypothesis is rejected if the statistic has a value below -1.65 at 5 %. The existence of club convergence can be observed by assessing the patterns using the log t regressions. This is due to the notion that the rejection of the null of convergence does not imply divergence, as different scenarios can be met, such as separate points of equilibrium or steady-state growth paths, as well as convergence clusters in the full panel.

4. Results and Discussion

Prior to examining the convergence club, establishing series stationary is important. The Augmented Dickey-Fuller (ADF) (1979) unit root test was used for this purpose. Table 1 shows the results of the unit root test indicating that all variables are I (1). Table 2 and Table 3 report the results of the panel convergence for the FDI inflow and trade shares series filtered with the Hodrick-Prescott filter for 16 East Asian Pacific countries.

Table 1: Unit Root Test

Countries	FDI Inflow Ratio	Trade Share
Brunei	-6.92	-5.08
Cambodia	-5.94	-4.95
China	-3.54	-3.55
Hong Kong	-6.57	-3.82
Indonesia	-3.95	-7.77
Lao PDR	-3.98	-4.04
Macau	-8.07	-2.92
Malaysia	-5.86	-4.30
Mongolia	-4.81	-5.09
Myanmar	-5.77	-3.99
Philippines	-9.31	-4.59

Table 1: (Continue)

Countries	FDI Inflow Ratio	Trade Share
Singapore	-6.64	-6.38
South Korea	-5.57	-4.81
Taiwan	-4.71	-
Thailand	-4.26	-5.08
Vietnam	-4.82	-5.38

Note: The analysis uses intercept and linear trend. Critical values are at 1% at -4.37, 5% at -3.6 and 10% at -3.24. Data for Taiwan is not included in the results of trade shares due to data unavailability.

Table 2 shows that the log *t* regression for the full sample gives a *t* statistic of -8.38, rejects the null hypotheses of any investment convergence. It implies that there is no convergence in the full sample, requiring further investigation for evidence of convergence in the subgroup of the panel. Subsequently, there is a formation of four club convergences. The first club, represented by Hong Kong and Singapore is characterised by strong investment openness levels. It is not surprising that Hong Kong and Singapore belong in the first club. In 2016, both Hong Kong and Singapore were ranked top five in the World Bank Ease of Doing Business Index, raking in FDI inflows to GDP of 33.7% and 20.9%, respectively (World Bank, 2017). Deemed as the heavyweights of foreign investment of Asia, the sharp increases in mergers and acquisition in the two countries contributed to the upsurge in FDI inflows (Ming, 2018). The second is the integration of Cambodia, Macao, Lao PDR and Vietnam, while the third group comprises of Malaysia, Myanmar, Philippines and Taiwan. Interestingly, of late, there is an apparent shift in investment trend in Cambodia, Lao PDR and Vietnam from other countries. Leveraging on its central position, paired with low production cost and export-oriented strategy, these countries are increasingly becoming a hub for foreign investment and international business linkages. The fourth group encompasses China, South Korea, Thailand, Indonesia, Brunei Darussalam and Mongolia.

Table 2: Foreign Direct Investment Inflows (1990 to 2016)

Group	Countries	*t*-stat
Full Sample	Brunei Darussalam, Cambodia, China, Hong Kong, Indonesia, Lao PDR, Macau, Malaysia, Mongolia, Myanmar, Philippines, Singapore, South Korea, Taiwan, Thailand, Vietnam	-8.38
1st group	Hong Kong, Singapore	-1.51
2nd group	Cambodia, Macao, Lao PDR, Vietnam	-1.09
3rd group	Malaysia, Myanmar, Philippines, Taiwan	-0.15
4th group	China, South Korea, Thailand, Indonesia, Brunei Darussalam, Mongolia	-0.59

Figure 1 shows the FDI inflows to GDP relative transition trend of 16 East Asia Pacific countries during the sample period, as suggested by Phillips and Sul (2007). Over time, there is an absence of full convergence but countries tend to polarise based on their investment performances. In recent years, although the FDI inflows trend of some countries are moderating, the decline is not as sharp as Mongolia's investment receipt. Of significance, since 2011, the Mongolian FDI fell by 85% (U.S. Department of State, 2015). This is primarily compounded by the weakening of key commodity exports value of coal and copper. Furthermore, investors' confidence grew warily due to policy missteps by the Mongolian government (World Bank, 2013). Although there has been a change of government in 2016, the effects on Mongolia's FDI remains unclear. As it stands, Table 2 shows Mongolia to be converging in the fourth group. However, further dissipation of their FDI inflow may result in the country diverging with its counterparts in the region, thus the possibility of Mongolia being an outlier.

Figure 1: Transition Path of 16 Countries of East Asia Pacific

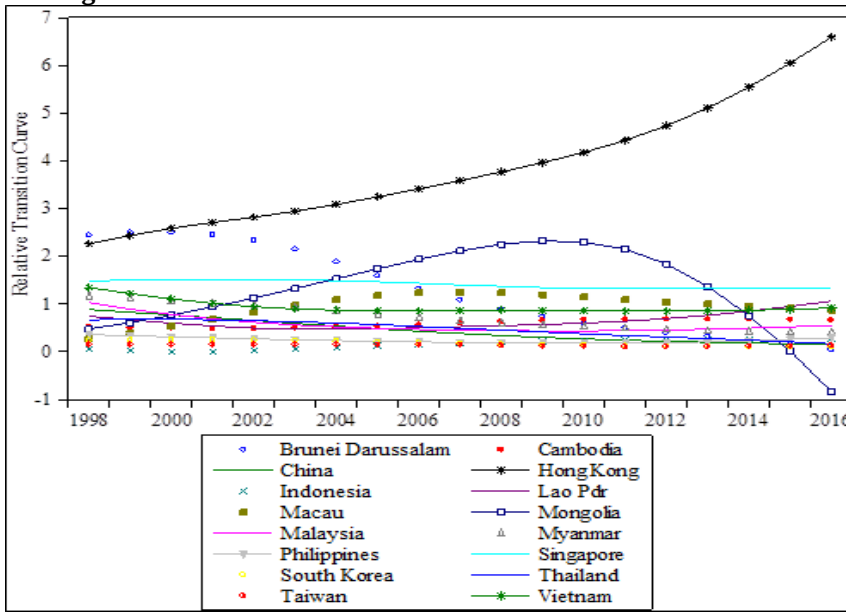


Table 3 shows the findings of trade convergence club formation using trade share over GDP as the proxy. The results, for full sample, reject the null hypotheses of trade convergence with a log (*t*) statistic of -2.63 (with the critical value at -1.67). Greater diversity in trade across countries warrants searching for trade convergence clubs within East Asia Pacific. The first club consists of Hong Kong, Singapore as well as Vietnam and they are

characterised by greater trade openness, with representing the highest value of trade shares in the region, 371.7%, 310.3% and 184.7% respectively. Hong Kong and Singapore has a longstanding history of free trade, whereby both countries practice almost complete free of trade barrier policies (Panagariya, 2003). This free trade status provided opportunity for these economies, particularly to expand their re-exporting trade activities. It is also worth mentioning Vietnam's remarkable placing in the leading group of trade openness of East Asia Pacific. The country's implementation of the open-door policy on trade reforms alongside its undeterred commitment to trade integration has proved to be fruitful. Since its 2007 World Trade Organization (WTO) membership acquisition, Vietnam's trade activity has been progressing steadily, primarily due to trade openness policies such as the removal or tariff and non-tariff barriers (Thach & Supinit, 2016). The second club includes Malaysia, Thailand, Cambodia, Macau, Mongolia, Brunei Darussalam, South Korea, Lao PDR, Philippines and Myanmar, while the third club comprises Indonesia and China. The reasoning to China's unprecedented placing in the third club could be conjectured by the deceleration in imports over the several years. China's rebalancing policy focuses on transitioning its economy away from exports and investment, towards domestic consumption (Lardy, 2007; Kang & Liao, 2016). This rebalancing act has led to weaker investments largely stemming from market uncertainties and China's import substitution strategies. As a result, the country faces sharp import slowdown, thus, leading to sluggish trade growth.

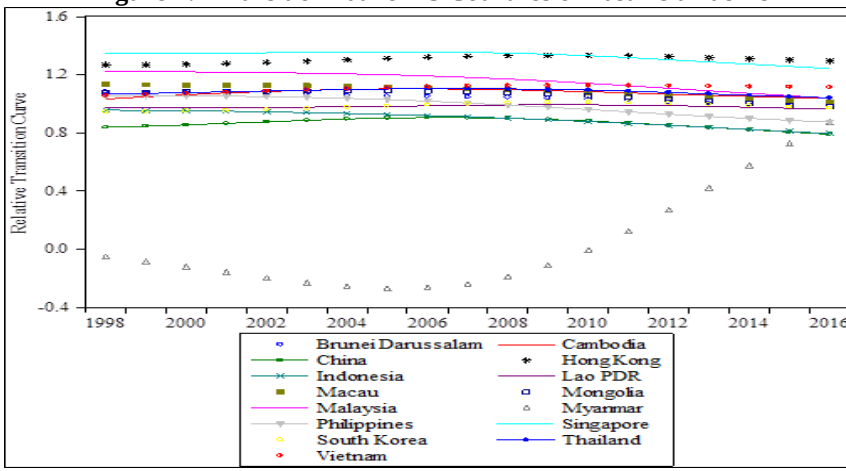
Table 3: Trade Shares over GDP (1990 to 2016)

Group	**Countries**	***t*-stat**
Full Sample	Brunei Darussalam, Cambodia, China, Hong Kong, Indonesia, Lao PDR, Macau, Malaysia, Mongolia, Myanmar, Philippines, Singapore, South Korea, Thailand, Vietnam	-2.63
1st Group	Hong Kong, Singapore and Vietnam	1.56
2nd Group	Malaysia, Thailand, Cambodia, Macau, Mongolia, Brunei Darussalam, South Korea, Lao PDR, Philippines, Myanmar	0.52
3rd Group	China, Indonesia	6.33

Figure 2 shows the transition path of each nation's trade shares over the sample period. The overall panel appears to be diverging across the participating countries, however, there is opportunity for clustering as shown in Table 3. Interestingly, Myanmar's trade is growing exceptionally, in line with the country's policy in liberalising trade and investment activities. Since coming out from isolation in 2011, there is an upsurge in trade activities, particularly on commodities (Naing, 2014). Myanmar's trade promotion policy as envisaged in the Framework for Economic and Social Reforms

(FESR) utilises its export strategy to expand and diversify foreign markets by using natural and human resources (Oo, 2013). These radical reforms have proven to be successful and if this continues, the country stands a chance in converging with countries in the first club as seen in Table 3.

Figure 2: Transition Path of 15 Countries of East Asia Pacific



5. Conclusion

This paper employs the Phillips and Sul's (2007) methodology that uses a nonlinear factor model with a common and idiosyncratic component, both time-varying, which allows for heterogeneity across the countries to evaluate trade and investment convergence clubs among 16 East Asia-Pacific countries for the period 1990 to 2016. In terms of trade and investment openness, the empirical findings suggest that countries did not form a homogenous convergence club. Consistent with convergence club theory, the results show a clustering of countries with similar stages of development; three and four clubs appear to be formed, based on trade and investment openness levels.

As East Asia Pacific countries continue their efforts to enhance their regional partnership, the results indicate the need for a functional integration system, one where trade and investment policy should be developed in tandem. Despite different level of catch-up processes, the results demonstrate possibilities of convergence amongst countries of the same group. Therefore, implementing more unified policies with greater consistency and efficiency will promote convergence, leading to a race to the top rather than the bottom (Apergis & Cooray, 2015).

East Asia Pacific countries are experiencing profound transformation and have grown rapidly comparatively to other regions in the last several decades. Nevertheless, as shown, convergence is only evident for a subset of groups within East Asia Pacific. It may also indicate that benefits of openness to trade and FDI that acts as two major contributing factors to swift growth (Lim & McAleer, 2004) cannot be enjoyed by all. Indeed, outward oriented strategy that brings about new technologies and diffusion of new products, allowing low and middle-income countries to catch-up with high-income nations could be limited due to lack of trade and investment convergence as a whole. For the sub-group of countries that presents weak convergence, further effectiveness of trade and financial policies are required to encourage stronger integration with other participating nations.

Acknowledgement

This work was supported by Ministry of Higher Education, Malaysia and Universiti Malaysia Sarawak [grant numbers *Research Acculturation Collaborative Effort* RACE/E (3)/1250/2015(06)].

References

Abd-Karim, M. Z. (2005). Trade openness, economic growth and convergence: evidence from selected asian countries. *Malaysian Management Journal*, *9*(1 & 2), 55-69.

ADB. (2013). *Regional cooperation and integration in a changing world.* Manila: Asian Development Bank.

Apergis, N., Christou, C. & Miller, S. (2012). Convergence patterns in financial development: evidence from club convergence. *Empirical Economics*, *43*(3), 1011-1040.

Apergis, N. & Cooray, A. (2016). Old wine in a new bottle: trade openness and FDI flows - are the emerging economies converging? *Contemporary Economic Policy*, *34*(2), 336-351.

Azariadis, C. & Drazen, A. (1990). Threshold externalities in economic development. *The Quarterly Journal of Economics*, *105*(2), 501-526.

Ballinger, T. P., Habegger, W., Jones, C. T. & Thompson, M. A. (2016). Convergence in venture capital investments: evidence from a panel of 18 US regions. *Journal of Regional Analysis & Policy*, *46*(2), 132-143.

Bandyopadhyay, S. (2011). Rich states, poor states: convergence and polarisation in India. *Scottish Journal of Political Economy*, *58*(3), 414-436.

Barro, R. J. (1991). Economic growth in a cross section of countries. *The Quarterly Journal of Economics*, *106*(2), 407-443.

Barro, R. J., Sala-i-Martin, X., Blanchard, O. J. & Hall, R. E. (1991). Convergence across states and regions. *Brookings Papers on Economic Activity*, 107-182.

Bartkowska, M. & Riedl, A. (2012). Regional convergence clubs in Europe: identification and conditioning factors. *Economic Modelling*, *29*(1), 22-31.

Bashar, O. K., Lau, C. W. & Sim, C. H. (2008). Impact of economic liberalisation growth: evidence from Malaysia. *Malaysian Journal of Economic Studies*, *45*(2), 79–94.

Basturk, N., Paap, R. & Van Dijk, D.J.C. (2010). *Financial development and convergence clubs* (No. EI 2010-52), Report / Econometric Institute, Erasmus University Rotterdam (pp. 1–28). Erasmus School of Economics (ESE). Retrieved from http://hdl. handle.net/1765/20741.

Behrens, K. & Murata, Y. (2012). Trade, competition and efficiency. *Journal of International Economics*, *87*(1), 1-17.

Ben-David, D. (1993). Equalizing exchange: trade liberalization and income convergence. *The Quarterly Journal of Economics*, *108*(3), 653-679.

Bernard, A. B. & Durlauf, S. N. (1995). Convergence in international output. *Journal of Applied Econometrics*, *10*(2), 97-108.

Bilquess, F., Mukhtar, T. & Sohail, S. (2011). What matters for financial development in D-8 countries? capital flows, trade openness and institutions. *Journal of Economic Cooperation & Development*, *32*(1), 71-86.

Baumol, W. J. (1986). Productivity growth, convergence, and welfare: what the long-run data show. *The American Economic Review*, *76* (5), 1072-1085.

Cass, D. (1965). Optimum growth in an aggregative model of capital accumulation. *The Review of Economic Studies*, *32*(3), 233-240.

Choi, C. (2004). Foreign direct investment and income convergence. *Applied Economics*, *36*(10), 1045-1049.

Cristobal-Campoamor, A. & Parcero, O. J. (2013). Behind the Eastern–Western European convergence path: the role of geography and trade liberalization. *The Annals of Regional Science*, *51*(3), 871-891.

Cyrus, T. (2004). Does convergence cause trade, or does trade cause convergence? *The Journal of International Trade & Economic Development*, *13*(4), 397-418.

Cuestas, J, C., Monfort, M. & Ordonez, J. (2013), Real convergence in Europe: a cluster analysis. *Economic Modelling*, *33*, 689-694.

Dickey, D. A. & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association, 74*(366a), 427-431.

Durlauf, S. N. & Johnson, P. A. (1995). Multiple regimes and cross-country growth behaviour. *Journal of Applied Econometrics*, *10*(4), 365-384.

Eicher, T. & Hull, L. (2004). Financial liberalization, openness and convergence. *The Journal of International Trade & Economic Development*, *13*(4), 443-459.

Falvey, R., Foster, N. & Greenaway, D. (2012). Trade liberalization, economic crises and growth. *World Development*, *40*(11), 2177-2193.

Galor, O. (1996). Convergence? inferences from theoretical models. *The Economic Journal, 106* (437), 1056-1069.

Gehringer, A. (2013). Growth, productivity and capital accumulation: the effects of financial liberalization in the case of European integration. *International Review of Economics & Finance, 25*, 291-309.

Ibrahim, J. & Habibullah, M. S. (2013). Financial convergence in the Asia Pacific economies. *Prosiding Perkem VIII, 2*, 1051-1058.

International Monetary Fund (2014). *World economic outlook 2014*. Washington, DC. Retrieved from http://www.imf.org/external/pubs /ft/weo/2014/02/.

Islam I. & Chowdhury, A. (1997). *Asia-Pacific economies: a survey*. London and New York: Routledge Press.

Kang, S. (2009). *ASEAN: Perspectives on economic integration: ASEAN in Asia Economic Integration*, IDEAS reports - special reports, Kitchen, Nicholas (ed.) SR002. LSE IDEAS, London School of Economics and Political Science, London, UK.

Kang, J. S. & Liao, W. (2016). *Chinese imports: what's behind the slowdown?* (Working Paper No. 16/106). Washington: International Monetary Fund. Retrieved from https://www.imf.org/en/Publica tions/WP/Issues/2016/12/31/Chinese-Imports-Whats-Behind-the-Slow down-43926.

Kiyota, K. (2012). Trade liberalization, economic growth and income distribution in a multiple-cone neoclassical growth model. *Oxford Economic Papers*, *64*(4), 655-674.

Koopmans, T. C. (1965). *On the concept of optimal economic growth* (Discussion Paper No. 163-A). New Haven: Cowles Foundation for Research in Economics. Retrieved from http://cowles.yale.edu/sites /default/files/files/pub/d01/d0163-a.pdf.

Lardy, N. R. (2007). China: rebalancing economic growth. In Paulson, H., Zoellick, R. B. & Mundie, C. (Eds). *The China Balance Sheet in 2007 and Beyond* (pp. 1-24). Washington, DC: Peterson Institute for International Economics.

Levine, R. & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *The American Economic Review*, *82*(4), 942-963.

Li, Q. (1999). Convergence clubs: Some additional evidence. *Review of International Economics*, *7*(1), 59-67.

Liew, V. K. S. & Lim, K. P. (2005). Income divergence? evidence of nonlinearity in the East Asian economies. *Economics Bulletin*, *15*(1), 1-7.

Liew, V. K. S. & Ahmad, Y. (2006). *Income convergence? evidence of nonlinearity in the East Asian economies: a comment* (MPRA Paper No. 519). Munich: Munich Personal Repec Archive. Retrieved from https://mpra.ub.uni-muenchen.de/519/1/MPRA_paper_519.pdf.

Lim, L. K. & McAleer, M. (2004). Convergence and catching up in ASEAN: a comparative analysis. *Applied Economics*, *36*(2), 137-153.

Liu, X. (2009). Trade and income convergence: sorting out the causality. *The Journal of International Trade & Economic Development*, *18*(1), 169-195.

Ming, C. P. (2018, January 29). Singapore, HK biggest Asia recipients of FDI after China in 2017: UNCTAD. Retrieved from https://www.businesstimes.com.sg/government-economy/singaporehk biggest-asia-recipients-of-fdi-after-china-in-2017-unctad.

Naing, D. Z. Z. (2014, September). *Trade policy reform in Myanmar*. Paper presented at the Asia-Pacific Trade Economists Conference: Trade in the Asian Century-Delivering on the Promise of Economic Prosperity. Bangkok, Thailand.

Oman, C. *Policy competition for foreign direct investment: A study of competition among governments to attract FDI*. Paris: Development Centre of the Organisation for Economic Co-operation and Development.

Oo, M. M. (2013). *The effect of trade liberalization on Myanmar foreign trade with selected Asian countries* (Paper No 8/2013). Muang: Mekong Institute. Retrieved from http://www.mekonginstitute.org /uploads/tx_ffpublication/minzas_wps_2013_8_effect_of_trade_myan mar.pdf.

Panagariya, A. (2003). *Miracles and debacles: do free-trade skeptics have a case?* (Paper No 308013). Missouri: Washington University St. Louis. Retrieved from https://econwpa.ub.uni-muenchen.de/econ-wp/it/papers/0308/0308013.pdf.

Parikh, A. & Shibata, M. (2004). Does trade liberalization accelerate convergence in per capita incomes in developing countries? *Journal of Asian Economics*, *15*(1), 33-48.

Phillips, P. C. & Sul, D. (2007). Transition modeling and econometric convergence tests. *Econometrica*, *75*(6), 1771-1855.

Phillips, P. C. & Sul, D. (2009). Economic transition and growth, *Journal of Applied Econometrics, 24*(7), 1153-1185.

Quah, D. (1993). Gallon's fallacy and tests of the convergence hypothesis, *Scandinavian Journal of Economics, 95*(4), 427 - 443.

Quah, D. T. (1996). Empirics for economic growth and convergence. *European Economic Review*, *40*(6), 1353-1375.

Quah, D. T. (1997). Empirics for growth and distribution: stratification, polarization and convergence clubs. *Journal of Economic Growth*, *2*(1), 27-59.

Rodrik, D. (2011). *The globalization paradox: democracy and the future of the world economy*. New York: W. W. Norton & Co.

Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, *94*(5), 1002-1037.

Selvarajan, S. K. & Ab-Rahim, R. (2017). Economic liberalization and its link to convergence: empirical evidence from RCEP and TPPA countries. *International Journal of Business and Society*, *18*(3), 439-460.

Slaughter, M. J. (2001). Trade liberalization and per capita income convergence: a difference-in-differences analysis. *Journal of International Economics, 55*(1), 203-228.

Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics, 70*(1), 65-94.

Song, P. C., Sek, S. K. & Har, W. M. (2013). Detecting the convergence clubs and catch-up in growth. *Asian Economic and Financial Review*, *3*(1), 1-15.

Soukhakian, B. (2007). Financial development, trade openness and economic growth in Japan: evidence from Granger causality tests. *International Journal of Economic Perspectives, 1*(3), 118-127.

Swan, T. W. (1956). Economic growth and capital accumulation. *Economic Record, 32*(2), 334-361.

Thach, N. P.C. & Supinit, V. (2016). The analysis of trade liberalization of Vietnam with ASEAN. *International Journal of Thesis Projects and Dissertation, 4*(3), 27-34.

United Nations Conference on Trade and Development. (2013). *World investment report 2013*. Geneva: United Nations Conference on Trade and Development. Retrieved from http://unctad.org/en/Publications Library/wir2013_en.pdf.

United States Department of State. (2015). *Mongolia investment climate statement 2015*. Ulaanbaatar: U.S. Embassy of Mongolia. Retrieved from https: / / www. state. gov / documents / organization /241879.pdf.

Wang, J. (2007). Financial liberalization in East Asia: lessons from financial crises and the Chinese experience of controlled liberalization. *Journal of World Trade, 41*, 213-243.

Wang, M. S. (2012). Income convergence within ASEAN, ASEAN+ 3: A panel unit root approach. *Applied Economics Letters*, *19*(5), 417-423.

Wilson, J. D. (2015). Mega-regional trade deals in the Asia-Pacific: choosing between the TPP and RCEP? *Journal of Contemporary Asia*, *45*(2), 345-353.

Wong, H. T. (2005). Openness, financial development and economic growth in Malaysia. *International Journal of Business and Society*, *6*(1), 93-121.

World Bank. (2008). *World Bank annual report 2008.* Washington, DC: World Bank. Retrieved from http://www.worldbank.org/.

World Bank. (2013). *Mongolia economic update* (No. 129025). Washington, DC: World Bank. Retrieved from http://www.worldbank.org/.

World Bank. (2017). *Doing business 2017: equal opportunity for all*. Washington, DC: World Bank. Retrieved from http://www.world bank.org/.

Zhang, Z. (2001). Trade liberalization, economic growth and convergence: evidence from East Asian economies. *Journal of Economic Integration*, 16(2), 147-164.

Institutions and Economies
Vol. 10, No. 4, October 2018, pp. 110 - 111

Book Review

Contributions to the Economics of International Labor Standards, by Arnab K. Basu and Nancy H. Chau, (eds.) 2018, World Scientific: Singapore, 429 pp.

The book is a collection of 13 chapters that discuss labour standards in both de facto (5 Chapters) and de jure (5 chapters) terms. The labour enforcement and compliance of standards are examined in three chapters. The book traverses important issues of labour standard violations that cover child labour, human trafficking, sweatshop jobs, informal (vulnerable) workers, and revisits the design of policy responses in the form of social labelling and trade sanctions, rural employment guarantee schemes, minimum wage legislations and tax policies.

Almost all chapters are based on rigorous theoretical models to advance the understanding of labour market institutions, determinants of workers' well-being and effectiveness of policy intervention. Recognising the ways in which the labour market deviates from standard assumptions, the authors have developed formal models to sharpen the analysis. Chapter 2 examines bonded child labour in the context of an overlapping generations model, Chapter 3 explores the human trafficking market in a two-way bilateral bargaining model, Chapters 4 and 5 employ a search model for sweatshop jobs and contractual dualism in formal and informal labour markets respectively, while Chapter 8 proposes a spatial model of producer market access by incorporating middlemen and fair traders. Some other chapters developed models to either formalise or refine nuanced arguments that often go unappreciated or unnoticed. For example, Chapter 6 brings together several strands of literature, capital mobility, information asymmetry, firm heterogeneity and the economics of labour disputes, to flesh out consequences of labour market on footloose industries. Likewise, Chapter 7 offers new insights into the ineffectiveness of trade sanctions against unlabelled products based on a theoretical model on the merits of social labelling ('child-labour free') in a North-South trade context.

The labour standards under consideration are discussed in depth in Chapters 9, 12, 13 and 14. Chapters 9 and 13 focus on employment guarantee schemes, while Chapters 12 and 14 refer to minimum wage laws. Conversely, broader and patchy issues (whereby the evidence is still slim), such as the race to the bottom and the ratification of International Labour Organization (ILO) conventions, are tackled in Chapters 10 and 11. Chapter 10 develops a trade model to examine the Southern race to the

bottom in labour standards and Chapter 11 reveals the determinants of the likelihood of ratification using a proportional hazard model. Chapters 3 and 11 specifically stand out relative to the other chapters as both use econometric estimations to make an empirical case after the theoretical discussion. The empirical findings from Chapter 3 support the mutual reinforcement view of considerable ease of mobility for traffickers and inelastic demand for trafficked victims, while the results in Chapter 11 examine the use of ratification as a proxy for higher domestic standards.

The last three chapters of the volume, Chapters 12, 13 and 14, though significantly different, complement the earlier chapters as they explore the issue of the credibility of enforcement of labour standard. This is an important finding as enforcement of standards remains a vexing dilemma in the area of labour standards. Further, since deficits in labour standards characterise the developing world, the models proposed in this book are also considered useful as they embody prominent features and assumptions that are relevant to developing economies. The models developed, for example, are based on an agrarian and rural economy (Chapters 2 and 9) and the informal sector (Chapters 5 and 14), and other stylised facts of a traditional economy such as credit insufficiency (Chapter 2), middlemen market power (Chapters 3 and 8), poor job quality (Chapter 4) and weak enforcement of labour contract and tied labour contract (Chapters 5 and 9).

The book contains invaluable information that labour economists and graduate students can refer to when conducting research on the economics of international labour standards. Importantly, the findings offer rich possibilities and suggested routes for future research.

Evelyn S. Devadason
Faculty of Economics and Administration
University of Malaya
Email: evelyns@um.edu.my

Institutions and Economies
Vol. 10, No. 4, October 2018, pp. 113 - 115

Book Review

The Malaysian Estates Staff Provident Fund 1947-2017: Malaysia's Oldest Provident Fund, With An Economic, Social and Political Perspective by Dato' Jeyaraj C. Rajarao, 2018, The Strategic Information and Research Development Centre: Malaysia, 434 pp.

This is an interesting and instructive book that uses a combination of utilitarian journalism and a normative perspective not only to crisply unravel the social history of the Indian workers who moved from India to work in the plantations of British Malaya, but also immigrants from China and Indonesia, refuting the idea that only the Chinese and Indians are immigrants stigmatized as "pendatangs" but also asserting that those who now call themselves as Malays or bumiputeras are of similar nomenclature. The analysis includes how the Indian and Chinese immigrants, deliberately brought into Malaya or facilitated by the British colonialists, suffered toiling in the plantations, tin mines and as general labourers, and had to do so even after independence. The book breaks ground by getting to the bottom of these issues using fresh observations, as well as secondary ones, and primary work to specifically capture the founding and the evolution of the Malaysian Estates Staff Provided Fund (MESPF), 1947-2017. It is the only book and the very first that records the full history of the MESPF.

Organized into twelve chapters with a Foreword by Dr Jomo Kwame Sundaram and a Preface by the author Rajarao, the book presents a detailed socio-political account of Malaysia's oldest Employees Provident Fund (EPF). Chapter one provides the setting by discussing some important accounts of the different forms of labour exploitation, including slavery. Chapter two discusses Malaysia's history over several centuries especially the earliest Indian immigration to Malaya. This chapter considers quite inexorably the various problems that were sprung from the early days leading to the current divisive political, economic and social problems of the Malaysian society even today. Chapter three starts the real discussion related to the book. It sets the foundation by articulating the opening up of estates and the division of labour that arose to manage investment, cultivation, processing and exports, initially rubber and later other crops, such as oil palm set in the background of the commodity crises that converged with the great depression. The seminal reasons for the founding of the MESPF are thoroughly examined in chapter four, and the roles of the earliest Chairmen discussed. Chapters five and six deal with the fundamental issues of membership, leadership and particular struggles in the MESPF set within the broader political development of the country,

while chapter seven discusses the issues relating to British plantation estates' vulnerabilities after the introduction of the New Economic Policy in 1971, and the formation of the Perbadanan Nasional Berhad (PERNAS) and Permodalan Nasional Berhad (PNB) that acquired private assets based on their own unilateral decisions.

Chapters eight and nine discuss investment strategies, members' retirement plans, widening of security portfolios and the transition to national leadership of the MESPF, and the painstaking attempt to salvage sterling investments that were decimated from the 1967 sterling devaluation. Nevertheless, both chapters also discuss restructuring of investments to avert external financial exposure. Chapter nine also provides a detailed account of the introduction and development of employees provident funds, including the EPF founded four years after the setting up of the MESPF, and the consequential calls for the closing down of the MESPF owing to a divergence in performance between its focus on government securities and market securities, which coincidentally was also reflected in MESPF's declining membership.

Chapters 10, 11 and 12 discuss the switch from rubber to oil palm cultivation and the economic implications of it. The three chapters also discuss the roles played by the new captains of MESPF as they faced a contracting membership, especially with the emergence of the EPF as a mandatory, powerful and potent welfare instrument, not excluding its ready support of many of the government's projects or rescue episodes. The postscript provides the latest on attempts to wind down the MESPF, which is currently undergoing legal treatment. It took quite a bit of reading before I could see the discussion on MESPF. The book could have been more focused if only the discussion had started from chapter four as the discourse earlier on class struggle and slavery, is also followed through in the later chapters. The MESPF narration has excluded studied reasons for the real labouring and slaving class from its membership. It would also have been nice to relate some of the developments around published works to integrate the book better with the scholarship that have evolved in the field. For example, it would have been nice to see connections with Henri Fauconnier's book, The Soul of Malaya, and Colin Abraham's 1977 doctoral thesis submitted to Oxford University, The Making of Race Relations in West Malaysia with Special Reference to Modern Political Economic Development. In contrast to the claim made on pages 270-271, the causes of the Asian financial crisis are now clear. In fact, the United Nations Conference on Trade and Development, reported in 1996 in its Trade and Development Report (lead author: Akyuz Yilmaz) that the countries facing chronic current account deficits and rising high debt service were on the brink of financial collapse.

As it is now, the book has opened up space for at least three more books that could extend the discourse on Trade Unions and Communism in Malaya, History of Social Security Investments in Malaysia, and finally Ownership and Control in the Malaysian Economy. The first could help strengthen existing knowledge on the link between communism and trade unions in Malaysia, which both the colonial and independent Malaysian government often claimed to have been led by communist leaning leaders. The second will help establish a firm foundation in a field that is bereft of serious scholarly analysis. The third could help extend the interesting works of James Puthucheary, Lim Mah Hui and Edmund Terence Gomez on changes in economic ownership and control in Malaysia with a strong employee anchor. Finally, I would have liked a critical assessment of MESPF by comparing it with other provident funds, including with the so-called best performing funds globally.

Overall, this is a wonderful and illuminating book that offers an insightful analysis of a key fund associated with social protection, i.e. the MESPF from the perspective of its beneficiaries, though it does not dabble on the exclusion of the labouring class. The extemporaneous and colourful choice of language makes the reading of the book even more absorbing because of its unsparing and vivid observations on many matters affecting Malaysia.

Acknowledgement

Acknowledgement is made to Rubber Asia (September-October Issue 2018) of Asian Business Media LLP for permission to reprint the book review.

Prof. Dr Rajah Rasiah
Distinguished Professor of Economics
Asia Europe Institute
University of Malaya
Email: rajah@um.edu.my