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Macroeconomic Variables and In-Migration in Malaysia's Developed States

(Migrasi Masuk dan Pembolehubah Makroekonomi bagi Negeri-Negeri Maju di Malaysia)

Nor Ermawati Hussain
Noor Haslina Mohamad Akhir
Universiti Malaysia Terengganu

Mohd Shahidan Shaari
Universiti Malaysia Perlis

Diana Nabila Chau Abdullah
Universiti Malaysia Sabah

ABSTRACT

Nowadays, in-migration is one of the important phenomena that affects urbanisation and development in the destination area. Indirectly, it will cause the rapid growth of the population, leads to overcrowding, competition for jobs, unemployment, poverty and the formation of new towns in the destination area especially urban areas. However, for rural destination areas, in-migration of professionals is important to stimulate economic growth. Hence, the objective of this study is to forecast and analyze the effect of macroeconomic variables on in-migration into developed states in Malaysia. Using the annual time series data from 1980 to 2012, Autoregression Distributed Lag (ARDL) and Granger-causality test were conducted. The findings have found that long run and short run relationships exist between in-migration and macroeconomic factors for developed states. The forecasting until year 2020 expects that in-migration will increase in Perak and Penang. Investment factors that are concentrated in the developed states also affect the population's decision to migrate especially in Kuala Lumpur and Selangor. To promote the economic growth, foreign direct investment and domestic investment for development sector should be intensified to improve household incomes in the region. Besides, Perak and Selangor need to improve the existing policies to ensure that there is an increase in foreign direct investment and domestic investment.

Keywords: In-migration; overcrowding; macroeconomics; forecasting; investment

ABSTRAK

Pada masa ini, migrasi masuk merupakan satu fenomena penting yang mempengaruhi urbanisasi serta pembangunan di kawasan destinasi. Secara tidak langsung, ia akan menyebabkan berlakunya kepesatan penduduk, kepadatan penduduk, persaingan mendapatkan pekerjaan, pengangguran, kemiskinan serta pembentukan bandar-bandar baru di kawasan destinasi khususnya kawasan bandar. Namun, bagi kawasan destinasi luar bandar, migrasi masuk golongan profesional penting untuk menggalakkan pertumbuhan ekonomi. Justeru, objektif kajian ini adalah untuk membuat unjuran serta menganalisis hubungan yang wujud di antara faktor penentu makroekonomi dengan migrasi masuk ke negeri maju di Malaysia. Dengan menggunakan data siri masa tahunan dari tahun 1980 hingga 2012, ujian Autoregresi Lat Tertabur (ARDL) dan ujian Sebab-akibat dijalankan. Hasil kajian mendapati wujud hubungan jangka panjang dan jangka pendek antara pembolehubah migrasi masuk dengan pembolehubah makroekonomi bagi negeri-negeri maju ini. Hasil unjuran sehingga tahun 2020 menjangkakan bahawa migrasi masuk akan meningkat di Perak dan Pulau Pinang. Faktor pelaburan yang tidak sekata dan tertumpu di kawasan maju antara faktor yang mempengaruhi keputusan penduduk untuk berhijrah, terutama ke Kuala Lumpur dan Selangor. Untuk menggalakkan pertumbuhan ekonomi, pelaburan asing dan pelaburan domestik untuk sektor pembangunan perlu dipergiatkan bertujuan untuk meningkatkan pendapatan isi rumah. Selain itu, Perak dan Selangor perlu memperbaiki dasar sedia ada untuk menggalakkan kemasukan pelaburan asing dan pelaburan domestik.

Kata kunci: Migrasi masuk; kepadatan; makroekonomi; unjuran; pelaburan

INTRODUCTION

This paper presents ongoing research findings on in-migration and the economic development in Malaysia. The overarching aim of the whole study has been to understand how economic growth of Malaysia is affected by numerous factors. To achieve this aim, three research questions are phrased: Why migration to the destination area occurred? Are macroeconomic factors attracting migration to the destination areas? And how

far macroeconomic factors affect future citizen decisions to migrate?

For this paper, we will focus on the first of these questions and will discuss the findings gathered so far to describe the extent to which the in-migration between several developed states is affected by the economic development of that area. In particular, this paper tries to articulate about the difficulty in controlling the migration to the destination area will affect both in the short run and long run.

Numerous research has shed light on how in-migration can stimulate the socio-economic development of the area (Yaakob & Masron 2010) that involves migration of people across the village, region or states in a country without reaching international boundaries (Appleyard 1992; Hashim & Seng 2012; Musa & Abdullah 2013). Generally, there are several patterns of in-migration flows that are between urban areas, urban to rural areas, rural to urban areas, between rural areas, city centre to the outskirts of the city and transmigration (Musa & Abdullah 2013; Yaakob & Masron 2010). In Malaysia, in-migration is not just a matter of race and but it is caused by several factors such as job opportunities, marriages and educational opportunities in the destination areas (Chitose 2003).

Based on the Department of Statistics, Malaysia, the direction of the population movement in the 1980s, 1990s and early 21st centuries were more focused on developed areas such as Malacca, Kuala Lumpur, Selangor, Penang and Negeri Sembilan (Malaysia Department of Statistics 1982; 1999; 2004). Kuala Lumpur is the capital of Malaysia and even the movement of people to Kuala Lumpur is still ongoing. However, the trend is changing when the number of people entering Kuala Lumpur seemed to reduce from the 1990s to early 21st century due to the migration of people into the other states such as Selangor, Penang, and Malacca (Malaysia Department of Statistics 1999; 2004).

In-migration may also lead to an increase or reduction of a population in a particular area. Based on the Malaysia Department of Statistics (2008), 7,040 residents from Kuala Lumpur migrated to Selangor, 1,060 migrants to Malacca, 1,680 migrants to Negeri Sembilan and 2,590 migrants to Perak. Percentage of migration to Kuala Lumpur reduces due to migration out of urban to outskirts areas, as well as the effect of the high cost of living and the desire to have their own house (Rostam 2006; Rostam et al. 2010a; 2010b). In Penang, the high cost of living has caused people to migrate from Penang and stay in nearby states. The price of the house that soared up to RM 500,000 per unit has been identified as one of the major reasons that canceled the intentions of the local people to stay there (Noh 2012).

The above scenario exemplifies many research findings that suggest the economic development as an inevitable factor leading to in-migration. For instance, the closure of 200 manufacturing industries in Kelantan created inconsistencies in economic growth witnessing how foreign investors switched their investments to the other parts of the country such as Malacca, Terengganu (Bernama 2013a; 2013b), Selangor, Penang and Kuala Lumpur (Bernama 2013c; Yaakob & Masron 2010). Eventually, this situation motivated people to migrate to these areas of which offer more jobs opportunities.

Another report by the National Population and Family Development Board study also documented the similar trend of in-migration to rapidly developed states such as Selangor, Johor, Negeri Sembilan, Malacca and Penang mainly for the hunt of job opportunities (Rahman 2011). Thus, domestic investment is also seen to play an important role in enhancing the economic growth in these states.

This scenario has created a worrying issue which the lack of domestic investment in the less developed states led to low job opportunities in such areas. In such a case, the number of domestic investors is seen as a crucial factor for job creation, living standards improvement and the number of out-migration reduction.

Many scholars argue that the migration is becoming a factor to increase labour force participation in the area of destination (Badaoui et al. 2013; Zhang & Meng 2010). Around 70 percent of migrants are concentrated in urban areas aiming to get a job. The dumping of this labour force may create job competition, thereby causing unemployment and poverty in the destination areas. Unemployment also happened due to the attitude of some graduates who are choosy in findings jobs and decide on working in selected areas of their choice at the expense of accepting new experience and challenge (Bernama 2012). Thus, in-migration can bring advantages and disadvantages to the destination areas in the future.

Most studies of migration in Malaysia are more focused on the micro level by focusing on individual decisions to migrate to urban and rural areas regardless of macro level. Normally, the number of migrants in developed areas because there are jobs, education and infrastructure facilities are better than in the less developed states. Thus, there is a large income gap between the developed and less developed states. Thus, this study aims to forecast and analyze the effect of macroeconomic variables on in-migration into developed states in Malaysia. The analysis will be done according to the states in Malaysia. The study is expected to help policymakers develop policies related to migration to boost economic growth, attracting foreign and domestic investors to invest and find ways to reduce poverty and unemployment rates in problem areas.

LITERATURE REVIEW

Several studies have been conducted on in-migration and the factors of the migration are to improve the economic factors (Filiztekin & Gokhan 2008; Napolitano & Bonasia 2009; Said et al. 2010), employment opportunities (Pirciog 2009; Rostam 2006; Malaysia Department of Statistics 2009), poverty (Chowdury et al. 2012; Filiztekin & Gokhan 2008), welfare and social network in the destination area (Filiztekin & Gokhan 2008; Saptanto et al. 2011; Napolitano & Bonasia 2009), and unemployment (Filiztekin & Gokhan 2008; Chowdury et al. 2012).

On the other hand, several studies have conducted by Olajide and Udoh (2012), Bunea (2012), Duc et al. (2012) and Savolainen (2011) to find out the relationship between in-migration and socio-economic factors. In Nigeria, Olajide and Udoh (2012) found that there are several numbers of pull and push factors of migration from single, no education and no skills to migrate and positive relationship with infrastructures in the destination area. In Romania, Bunea (2012) found that migration has a big impact on the population size, per capita real gross output, the index of amenities, road density and crime rates. Besides that, Savolainen (2011) found that the Kampala district is a major destination in Uganda and signs of this relationship can be in terms of infrastructure and culture factors. Therefore, it can be concluded that development in the destination area has become a driving factor for in-migration.

However, there are some households who decide to migrate in rural areas such as in Vietnam, Duc et al. (2012) found migrants are more likely to live in the agriculture-based area, with less promising jobs and income generation. But nowadays, several studies have been conducted to see in-migration pattern (Boutin 2017; Hussain et al. 2014). In Uganda, Boutin (2017) found that in-migration from urban to rural creates problems for migrants to get their first job. In Malaysia, Hussain et al. (2014) found that in-migration is a way to improve household income and to get a better job especially from rural-urban migration.

Besides that, to find out the relationship between in-migration and household income, several previous studies have been conducted (Deb & Seck 2009; Ha et al. 2009; Hussain et al. 2014; Roy & Debnath 2011). Ha et al. (2009) found that migration will create a huge income gap between people in China. In India, Roy and Debnath (2011) found that migration can increase income, while the postponement of that migration was positively influenced by the level of per capita income. Deb and Seck (2009) found that the migration has increased socio-economic status through increased income in Indonesia and Mexico. In Malaysia, Hussain et al. (2014) found that there is a positive relationship between in-migration and household income in rural-urban migration. Thus, migration is seen as important for some people to improve household income through job opportunities in destination areas.

Furthermore, several studies have been conducted to find out the relationship between in-migration with labour force participation (Awuse & Tandoh-Offin 2014; Badaoui et al., 2013; Monras 2014; Piyapromdee 2014; Saracoglu & Roe 2013; Strobl & Valfort 2013) and unemployment (Cornwell & Inder 2004; Hussain et al. 2014; McCatty 2004). In Ghana, Awuse and Tandoh-Offin (2014) found a positive relationship between in-migration and job opportunities. According to Saracoglu and Roe (2013), they found that there is a redistribution of the workforce through labour migration between regions, but there is still a difference in income between male and female labour. In Thailand, Badaoui et al. (2013) found a positive relationship of male labour income and negative relationship for the female labour market. In Uganda, Strobl and Valfort (2013) found a negative relationship between in-migration and labour participation. Besides that, Monras (2014) found it difficult to leave the origin area to migrate to the region in crisis because this situation is important to avoid the shortage of labour supply in the U.S. metropolitan area. While Piyapromdee (2014) found that if there was an increase of 30 percent for migrant stocks, it would have a minor impact on the wage and welfare level of the population in the U.S. Other than that, Cornwell and Inder (2004) and McCatty (2004) found that there is negative relationship between in-migration and unemployment. In Malaysia, Hussain et al. (2014) found that there is negative relationship between in-migration and unemployment in rural-urban migration.

However, migration is also caused by the problem of poverty in the origin area. Several studies have been conducted to find out the relationship between in-migration and poverty (Chowdhury et al. 2012; Gransow 2012; Siddiqui 2012; Zohry 2009). All previous studies found that there is a positive relationship between in-migration and poverty in destination areas. In Bangladesh, Chowdhry et al. (2012) found that people who migrated to the Sylhet city are caused by poverty factor. In China, Gransow (2012) found that in-migration in China has contributed greatly to the improvement of rural household income and one way to reduce rural poverty. According to Siddiqui (2012), he found that there is a positive relationship between in-migration and poverty in South Asia, Southeast Asia, South Africa, East Africa and West Africa. Besides that, Zohry (2009) found that there is a positive relationship between in-migration and poverty in Egypt.

Next, investments can also help the economic growth and create jobs. Some studies have been conducted to view the relationship of migration and investments (Hussain et al. 2015; Foad 2011; Xue & Gao 2012). In Malaysia, Hussain et al. (2015) found that there is a long-run relationship between in-migration with FDI in Kuala Lumpur and the long-run relationship between in-

migration and domestic investment in Penang. In China, Xue and Gao (2012) found that most people in rural areas to migrate to urban areas. This led to a huge income gap between urban and rural areas in China. Meanwhile, Foad (2011) found the significant complementary relationship between the flow of labour and capital across borders. Growth in labour migration has encouraged the entry of FDI into the states which is the focus of migrants in the U.S.

Based on previous empirical studies, there is a lack of research related to the relationship between in-migration with investment factors and in-migration with unemployment especially in Malaysia. Although there are macro-studies, such as 100 villages in China, in Malaysia, still lack macro-studies and focus on the states. Thus, this study combines all the variables of migration, population, foreign direct investment, domestic investment, household income, unemployment, poverty and labour force participation for several developed states in Malaysia.

METHODOLOGY

The analysis of this study using annual time series data from 1980 to 2012. Malaysia Department of Statistics (2010) has classified the developed states and developing states. The developed states include Johor, Kuala Lumpur, Malacca, Negeri Sembilan, Perak, Penang and Selangor. Thus, the focus of this study is on 7 developed states that have been listed by Department of Statistics in the year 2010. The annual time series data was run separately. According to Pesaran et al. (2001) and Narayan (2005), the sample size for time series data is accepted between 30 to 80 sets of data. The theory used is the decision-making by Lee (1966) because he was focused on the push and pull factors of migration. Based on the objectives of the study, the main equations have been formed as follows:

$$\begin{aligned}\ln MM_{it} = {} & \beta_0 + \beta_1 \ln POP_{it} + \beta_2 \ln FDI_{it} + \beta_3 \ln DI_{it} \\ & + \beta_4 \ln HHI_{it} + \beta_5 \ln UN_{it} + \beta_6 \ln POV_{it} \\ & + \beta_7 \ln TB_{it} + \ln \varepsilon_t \end{aligned} \quad (1)$$

where MM is in-migration, i is state, t is the year, POP is destination population, FDI is a foreign direct investment, DI is a domestic investment, HHI is the total household income, UN is unemployment, POV is poverty, TB is labour force participation and ε is an error. Each variable has its own measurement justification (TABLE 1).

For the relationship between these variables with in-migration, destination population will increase when in-migration occur. Meanwhile, foreign and domestic investors will open more jobs opportunities at destination states, and the same time, in-migration will increase. Thus, labour force participation will increase and household income is also expected to increase. Nevertheless, in-migration may also cause competition to citizen to get a job, perhaps some of which become unemployed and the proverty problem in destination states is expected to increase. So, this study is relevant to analyze the effect of macroeconomic variables on in-migration into developed states in Malaysia. Before other tests were conducted, autocorrelation and multicollinearity tests were carried out and the results found that no autocorrelation and multicollinearity in the model (1). So, the unit root test will be conducted to see the intensity of all variables at the first level and differentiation (Seddighi et al., 2000; Asteriou & Hall, 2007; Sahlan, 2010). The hypothesis for the unit root test is:

H_0: $\delta = 0$ (unit root exist/not stationary)
H_1: $\delta \neq 0$ (unit root does not exist/stationary)

Based on the hypothesis, if the t-statistic value obtained is greater than the critical value, then H_0 will not be rejected. But if the t-statistic is less than the critical value, then there is no unit root (H_0 is rejected). Next, the Autoregressive Distributed Lag (ARDL) method is conducted to examine the short run and long runs relationship between the variables. So the basic model for this method as follows:

$$\begin{aligned}\ln MM_t = {} & \alpha + \beta_1 \ln POP_t + \beta_2 \ln POP_{t-1} + \beta_3 \ln FDI_t \\ & + \beta_4 \ln FDI_{t-1} + \beta_5 \ln DI_t + \beta_6 \ln DI_{t-1} + \beta_7 \ln HHI_t \\ & + \beta_8 \ln HHI_{t-1} + \beta_9 \ln UN_t + \beta_{10} \ln UN_{t-1} \end{aligned}$$

TABLE 1. Definition and Measurement Justification of Variables.

Variable	Definition	Justification
MM	Those who migrate from one area to another.	per 1000 Population Ratio
POP	The total number of people living in one area.	Total Population
FDI	Investment made by foreign countries.	Malaysian Ringgit
DI	Investment invested by government or by private sector (domestic investors).	Malaysian Ringgit
HHI	Average monthly gross household income.	Malaysian Ringgit
UN	Those who are ready to find a job but have not yet got a job.	Total Population
POV	Monthly income of a household is less than the poverty line income.	Percentage of Poverty
TB	Those between the ages of 15 and 64 are either working or looking for work.	Total Population

Sources: Malaysia Department of Statistics, 2013; Economic Planning Unit, 2013

$$+ \beta_{11}\ln POV_t + \beta_{12}\ln POV_{t-1} + \beta_{13}\ln TB_t + \beta_{14}\ln TB_{t-1} + \delta_1 \ln MM_{t-1} + \mu_t \quad (2)$$

When the time lag is 1, then:

$$\ln MM_{t-1} = \alpha + \beta_1 \ln POP_{t-1} + \beta_2 \ln POP_{t-2} + \beta_3 \ln FDI_{t-1} + \beta_4 \ln FDI_{t-2} + \beta_5 \ln DI_{t-1} + \beta_6 \ln DI_{t-2} + \beta_7 \ln HHI_{t-1} + \beta_8 \ln HHI_{t-2} + \beta_9 \ln UNt{-}1 + \beta_{10} \ln UN_{t-2} + \beta_{11} \ln POV_{t-1} + \beta_{12} \ln POV_{t-2} + \beta_{13} \ln TB_{t-1} + \beta_{14} \ln TB_{t-2} + \delta_1 \ln MM_{t-2} + \mu_{t-1} \quad (3)$$

Next, substitute MM_{t-1} from equation (2) to equation (3), then:

$$\begin{aligned}\ln MM_t = {} & \alpha[1 + \delta_1] + \beta_1 \ln POP_t + (\beta_2 + \beta_1\delta_1)\ln POP_{t-1} \\ & + \beta_3 \ln FDI_t + (\beta_4 + \beta_3\delta_1)\ln FDI_{t-1} + \beta_5 \ln DI_t \\ & + (\beta_6 + \beta_5\delta_1)\ln DI_{t-1} + \beta_7 \ln HHI_t \\ & + (\beta_8 + \beta_7\delta_1)\ln HHI_{t-1} + \beta_9 \ln UN_t \\ & + (\beta_{10} + \beta_9\delta_1)\ln UN_{t-1} + \beta_{11} \ln POV_t \\ & + (\beta_{12} + \beta_{11}\delta_1)\ln POV_{t-1} + \beta_{13} \ln TB_t \\ & + (\beta_{14} + \beta_{13}\delta_1)\ln TB_{t-1} + \delta_1\beta_2 \ln POP_{t-2} \\ & + \delta_1\beta_4 \ln FDI_{t-2} + \delta_1\beta_6 \ln DI_{t-2} + \delta_1\beta_8 \ln HHI_{t-2} \\ & + \delta_1\beta_{10} \ln UN_{t-2} + \delta_1\beta_{12} \ln POV_{t-2} + \delta_1\beta_{14} \ln TB_{t-2} \\ & + \delta_t \ln MM_{t-2} + \delta_1\mu_{t-1} + \mu_t \end{aligned} \quad (4)$$

The process like equation (4) continued to assume that $|\beta_2|<1$ and equation (5) is obtained:

$$\begin{aligned}\ln MM_t = {} & \gamma + \beta_1 \ln POP_t + \beta_3 \ln FDI_t + \beta 5 \ln DI_t \\ & + \beta_7 \ln HHI_t + \beta_9 \ln UN_t + \beta_{11} \ln POV_t \\ & + \beta_{13} \ln TB_t + \textstyle\sum_{i=1}^{\infty} \delta_1^{i-1}(\beta_2 - \delta_1\beta_1)\ln POP_{t-i} \\ & + \textstyle\sum_{i=1}^{\infty} \delta_1^{i-1}(\beta_4 - \delta_1\beta_3)\ln FDI_{t-i} \\ & + \textstyle\sum_{i=1}^{\infty} \delta_1^{i-1}(\beta_6 - \delta_1\beta_5)\ln DI_{t-i} \\ & + \textstyle\sum_{i=1}^{\infty} \delta_1^{i-1}(\beta_8 - \delta_1\beta_7)\ln HHI_{t-i} \\ & + \textstyle\sum_{i=1}^{\infty} \delta_1^{i-1}(\beta_{10} - \delta_1\beta_9)\ln UN_{t-i} \\ & + \textstyle\sum_{i=1}^{\infty} \delta_1^{i-1}(\beta_{12} - \delta_1\beta_{11})\ln POV_{t-i} \\ & + \textstyle\sum_{i=1}^{\infty} \delta_1^{i-1}(\beta_{14} - \delta_1\beta_{13})\ln TB_{t-i} + \varepsilon_t \end{aligned} \quad (5)$$

where $\gamma = \alpha(1 + \delta_2 + \delta_1^2 + \delta_2^2 + \infty) = \alpha/(1 - \delta_1)$ and $\varepsilon t = \mu_t + \delta_1\mu_t{-}1 + \delta_1^2\mu_{t-2} + \infty$. While the differentiation models as follows:

$$\Delta\ln MM_t = \alpha + \beta_1 \Delta\ln POP_t + \beta_2 \Delta\ln FDI_t + \beta_3 \Delta\ln DI_t + \beta_4 \Delta\ln HHI_t + \beta_5 \Delta\ln UN_t + \beta_6 \Delta\ln POV_t + \beta_7 \Delta\ln TB_t + \mu_t \quad (6)$$

Using techniques introduced by Pesaran (1995) and Pesaran et al. (2001), boundary tests were conducted to estimate long run equations by OLS method (Abdullah & Habibullah 2008). Also using the techniques introduce by Pesaran et al. (2001), the relationship between dependent variables and independent variables is as follows:

$$\begin{aligned}\ln MM_t = {} & \beta_0 + \beta_1 \ln MM_{t-1} + \beta_2 \ln POP_{t-1} + \beta_3 \ln FDI_{t-1} \\ & + \beta_4 \ln DI_{t-1} + \beta_5 \ln HHI_{t-1} + \beta_6 \ln UN_{t-1} \\ & + \beta_7 \ln POV_{t-1} + \beta_8 \ln TB_{t-1} + \beta_{9,i} \textstyle\sum_{i=1}^{p} \Delta\ln MM_{t-i} \\ & + \beta_{10,i} \textstyle\sum_{i=1}^{q1} \Delta\ln POP_{t-i} + \beta_{11,i} \textstyle\sum_{i=1}^{q2} \Delta\ln FDI_{t-i} \\ & + \beta_{12,i} \textstyle\sum_{i=1}^{q3} \Delta\ln DI_{t-i} + \beta_{13,i} \textstyle\sum_{i=1}^{q4} \Delta\ln HHI_{t-i} \\ & + \beta_{14,i} \textstyle\sum_{i=1}^{q5} \Delta\ln UN_{t-i} + \beta_{15,i} \textstyle\sum_{i=1}^{q6} \Delta\ln POV_{t-i} \\ & + \beta_{16,i} \textstyle\sum_{i=1}^{q7} \Delta\ln TB_{t-i} + \beta U_t \end{aligned} \quad (7)$$

whereas Δ is the first stage of differentiation and equation (7) can be considered as the ARDL model which is known as a model (p, $q1$, $q2$, $q3$, $q4$, $q5$, $q6$, $q7$). Akaike Information Criteria (AIC) used to select the lat and the hypothesis of this test is as follows:

H_0: $\beta_1 = 0$ and $\beta_2 = \beta_3 = \beta_4 = 0$ (Long run relationship does not exist)

H_1: $\beta_1 \neq 0$ and $\beta_2 \neq \beta_3 \neq \beta_4 \neq 0$ (Long run relationship is exist)

Based on the hypothesis, if the t-statistic value obtained is greater than the critical value, then H_0 will not be rejected. There is no long run relationship between variables. But if the t-statistic is less than the critical value, then the long run relationship exists (H_0 is rejected). Next, Error Correction Model (ECM) is conducted to detect the existence of long-run error correction models for each state. In addition, this test can see a short-run relationship between the independent and dependent variable (Abdullah & Habibullah 2008). The error correction model is as follows:

$$\begin{aligned}\ln MM_t = {} & \mu + \textstyle\sum_{i-1}^{p} \phi_i \Delta\ln MM_{t-i} + \textstyle\sum_{j-1}^{q1} \varphi j \Delta\ln POP_{t-j} \\ & + \textstyle\sum_{k-1}^{q2} \gamma_k \Delta\ln FDI_{t-k} + \textstyle\sum_{m-1}^{q3} \theta_m \Delta\ln DI_{t-m} \\ & + \textstyle\sum_{n-1}^{q4} \eta_n \Delta\ln HHI_{t-n} + \textstyle\sum_{r-1}^{q5} \omega r \Delta\ln UN_{t-r} \\ & + \textstyle\sum_{s-1}^{q6} \zeta_s \Delta\ln POV_{t-s} + \textstyle\sum_{u-1}^{q7} \delta_u \Delta\ln TB_{t-u} \\ & + \mathrm{ECM}_{t-1} + \varepsilon_t \end{aligned} \quad (8)$$

whereas ϕ, φ, γ, θ, η, ω, ζ and δ is a dynamic coefficient for short run while v is a speed adjustment for long-run error correction. Subsequently, the causality test was conducted and Granger (1969) introduced this test to see the reaction between the two variables. In 1972, Sims had developed this model to alternative causes model (Asteriou & Hall 2007; Seddighi et al. 2000). The hypothesis of this causality model is as follows:

H_0: $\sum_{i=1}^{n} \beta_i = 0$ or X_t not cause-effect for Y_t

H_1: $\sum_{i=1}^{n} \beta_i = 0$ or X_t is cause-effect for Y_t

Based on the hypothesis, if the t-statistic value obtained is greater than the critical value, then H_0 will not be rejected. There is no cause-effect between variable X and Y. But if the t-statistic is less than the critical value, then the cause-effect between variable X and Y exists (H_0 is rejected). Next, a forecasting on in-migration started 2013 up to 2020 (8 years) will be carried out to look at the future migration trends. This forecasting uses the

ARIMA method where the autoregression (AR) model is as follows:

$$\ln MMt = \theta_1 \ln MM_{t-1} + \theta_2 \ln MM_{t-2} + \theta_3 \ln MM_{t-3} + \theta_4 \ln MM_{t-4} + \theta_5 \ln MM_{t-5} + \theta_6 \ln MM_{t-6} + \theta_7 \ln MM_{t-7} + \theta_8 \ln MM_{t-8} + \epsilon_t \quad (9)$$

RESULTS AND DISCUSSION

UNIT ROOT TEST

Based on the root unit test (APPENDIX A), in constant and level conditions, the findings show that all variables for the developed states are not significant. However, in constant and first difference conditions, only Selangor is not significant for variable namely labour force participation (TB). While for other states, all variables are significant at 1%, 5% and 10% significant level. This shows that H_0 is rejected for constant conditions. Similarly, in constant with trend and level conditions, all variables are not significant. But for constant with the trend and first difference, all variables for developed states are significant at 1%, 5% and 10% significant level. This indicates that H_0 is also rejected for constant with the trend conditions. Thus, all variables for the developed states are stationary and there is no unit root for this variable.

AUTOREGRESSION DISTRIBUTION LAG (ARDL)

The first step for this ARDL is to conduct a boundary test (TABLE 2). The result shows that all developed states have the long-run relationship and significant at 1%, 5% or 10% significance level. F-statistics boundary tests for Kuala Lumpur and Selangor are seen above the 1% critical value (4.26) and it significant at 1% significance level. Meanwhile, for Johor and Penang, the findings show that the F-statistic values are above the 5% critical value and significant at 5% significance level. For Malacca, Negeri Sembilan and Perak, the findings show that F-statistic values are above the 10% critical value and significant at 10% significance level.

The next step is to estimate the long-run coefficient to verify the stability of the model has been carried out. Based on TABLE 3, there is a long-run relationship between in-migration with at least one variable per developed states. Thus, H_0 which states that there is no long run relationship between variables is rejected for all developed states. Looking at the relationship between in-migration and population variables, there is a negative long-run relationship between Kuala Lumpur and Selangor. A 1% increase in population can cause in-migration to decrease by 18.01% in Kuala Lumpur and 19.18% in Selangor in the long-run. In the long-run, peoples living in Selangor and Kuala Lumpur began to migrate. Therefore, the number of populations decreases when in-migration increases.

For the long-run relationship between the variables in-migration and foreign direct investment, there is a positive relationship between these two variables for Kuala Lumpur, Malacca, Penang and Selangor. A 1% increase in foreign direct investment can cause in-migration to increase by 1.14% (Kuala Lumpur), 3.17% (Malacca), 4.13% (Selangor), and 0.41% (Penang) in the long run. This positive relationship is attributed to Selangor, Penang and Kuala Lumpur as the main industrial area in Malaysia and it has attracted foreign investors to invest in the area and this statement is supported by Yaakob and Masron (2010). The study results similar to studies conducted by Foad (2011) for the U.S. Besides that, for Perak, the findings show that there is a negative relationship between in-migration and foreign direct investment in the long-run. A 1% increase in foreign direct investment can cause in-migration to decrease by 0.30% in the long-run.

Meanwhile, for the long-run relationship between in-migration and domestic investment, there is a positive long-run relationship between Johor and Malacca. A 1% increase in domestic investment can cause in-migration to increase by 4.24% (Johor) and 0.18% (Malacca) in the long run. As foreign direct investment, domestic

TABLE 2. Boundary Test

State	F-statistic	Prob.	State	F-statistic	Prob.
Johor	4.80 **	0.03	Perak	3.06 *	0.08
Kuala Lumpur	60.08 ***	0.00	Penang	4.66 **	0.03
Malacca	3.46 *	0.06	Selangor	43.23 ***	0.00
Negeri Sembilan	3.10 *	0.08			
Critical Value	Lower	Upper			
1% Significant Level	2.96	4.26			
5% Significant Level	2.32	3.50			
10% Significant Level	2.03	3.13			

Note: Critical value is derived from Pesaran et al (2001), refer to table CI (iii) for case III (without constant constraints and no trends), ( ) is a probability while ***, ** and * are significance level at 1%, 5% and 10%.

TABLE 3. Long-Run Relationship Using ARDL Approach

States	Variables							
	lnPOP	lnFDI	lnDI	lnHHI	lnUN	lnPOV	lnTB	C
Johor	–5.58	0.17	4.24**	1.37	–0.18	1.189	4.33	83.10
Kuala Lumpur	–18.01***	1.14**	1.00	12.85*	–1.19*	1.95	30.88**	–519.50***
Malacca	–3.62	3.17**	0.18**	–10.06***	–1.47***	0.87**	–1.54	–75.35**
Negeri Sembilan	4.83	0.046	0.03	–1.18	0.18	0.71	21.30*	–105.34
Perak	1.75	–0.30**	0.14	–5.49**	–0.12	–0.39	3.10	19.85
Penang	6.73	0.41*	0.03	–9.34**	–0.88**	–0.18	3.21	–30.72
Selangor	–19.18***	4.13**	0.90	12.61*	–2.16***	1.87	23.87**	–530.44**

Note: ***, ** and * are significant level at 1%, 5% and 10%.

investment is important for economic growth in all developed states including Johor and Malacca. Johor's position near Singapore has attracted domestic investors to develop more infrastructure and tourist areas such as Legoland and Factory Outlets. This situation encourages population to migrate from other states to live in Johor.

Looking at the long-run relationship between in-migration with household income variables, there is a positive long-run relationship for Kuala Lumpur and Selangor. A 1% increase in household income can cause in-migration to increase by 12.85% (Kuala Lumpur) and 12.61% (Selangor) in the long run. The findings are supported by a study conducted by Gransow (2012) for China. Whereas for Malacca, Perak and Penang, the findings show that there is a negative relationship between in-migration and household income. A 1% increase in household income can cause in-migration to decrease by 10.06% (Malacca), 5.49% (Perak) and 9.34% (Penang) in the long run. Foreign direct investments and domestic investments in Malacca, Perak and Penang will open many job opportunities. Then lead to in-migration and competition to get a job. Hence, household income will decrease as some of the households may have no income due to the competition for employment.

In addition, there is a negative relationship between unemployment and in-migration for Kuala Lumpur, Malacca, Penang and Selangor. A 1% increase in unemployment can cause in-migration to decrease by 1.47% (Malacca) and 2.16% (Selangor) in the long run. Other than that, a 1% increase in unemployment can cause in-migration to decrease by 0.89% (Penang), and 1.19% (Kuala Lumpur) in the long run. The findings (the negative relationship between unemployment and in-migration) are supported by studies undertaken by Cornwell and Inder (2004) for South Africa. The rapid development in Kuala Lumpur, Malacca, Penang and Selangor has opened many jobs for the people to get a job. Hence, the long-run unemployment rate for these states has been reduced, thereby attracting people from outside areas to migrate.

For long-run relationships between in-migration and poverty, there is a positive long-run relationship for Malacca and the findings of this study are the same as the studies conducted by Chowdhury et al. (2012) for Bangladesh and Gransow (2012) for China. A 1% increase in poverty can cause in-migration to escalate by 0.87% (Malacca) in the long run. Otherwise, there is a positive long-run relationship between in-migration and labour force participation for Kuala Lumpur, Negeri Sembilan and Selangor. The findings are similar to those previously carried out by the Zhang and Meng (2010) for China. A 1% increase in labour force participation can cause in-migration to rise by 30.88 (Kuala Lumpur), 23.87% (Selangor), and 21.30% (Negeri Sembilan) in long the long-run.

Next, TABLE 4 shows the results of the error correction test and finds a long-run error correction (ECT). The ECT values for all developed states are significantly negative and it suggests that the long-run error corrections of 76% (Johor), 72% (Kuala Lumpur), 71% (Malacca), 70% (Negeri Sembilan), 57% (Perak), 71% (Penang) and 80% (Selangor) occur. Therefore, Johor, Kuala Lumpur, Malacca, Negeri Sembilan, Penang and Selangor require one and a half period of error correction in the long run to reach 100% while Perak requires a 2 period of error correction in the long-run to reach 100%. The findings show that all states have short-run relationships between in-migration with at least one dependent variable. Thus, H_0 which states that there is no short-run relationship between variables is rejected for all developed states.

Looking at the short-run relationship exists between migration and populations, the results found that Kuala Lumpur and Selangor have positive short-run relationships. A 1% increase in population can cause in-migration to increase by 8.70% (Kuala Lumpur) and 7.33% (Selangor) in short run. While there is a negative short-run relationship in Johor. A 1% increase in population can cause in-migration to decrease by 15.94% (Johor) in the short-run. In contrast to the long-run, in-migration to Kuala Lumpur and Selangor causes the state's population to increase in the short-run. The population density in the short-run will lead to out-migration in the long run much higher than the number of in-migration.

TABLE 4. Short-Run Relationship Using ARDL Approach

Variables	States						
	Johor	Kuala Lumpur	Malacca	Negeri Sembilan	Perak	Penang	Selangor
C	83.10	–375.4**	–75.35**	–105.34	31.13	–30.72	–421.02
ΔlnPOP(-1)	–15.94**	8.70**	3.81	6.03	–8.57	0.84	7.33**
ΔlnFDI (-1)	0.34**	–0.23	0.10	0.15	0.28	0.55**	–0.45**
ΔlnDI (-1)	0.30	1.45**	0.22	0.01	–1.09*	0.71**	1.38**
ΔlnHHI (-1)	12.05**	–1.51	0.29	–1.43	6.05*	–5.15**	2.84
ΔlnUN (-1)	0.85	–1.41**	–0.17	–0.62	–3.33**	–1.45**	–0.99**
ΔlnPOV (-1)	4.30**	4.69**	1.71**	0.79	3.24*	–0.22	5.94**
ΔlnTB (-1)	10.30**	55.67**	4.51	26.45**	15.86**	9.34**	64.18**
ECM (-1)	–0.76**	–0.72**	–0.71**	–0.70**	–0.57**	–0.71**	–0.80**

Note: ***, ** and * are significant level at 1%, 5% and 10%.

In addition to short-run relationships between migration and foreign direct investment, there is a positive short-run relationship for Johor and Penang. A 1% increase in foreign direct investment can cause a 0.34% increase in in-migration (Johor) and 0.55% (Penang) in the short-run. The increase in foreign direct investment for Penang is seen to have advantages in terms of human resources, infrastructure facilities and technological advancement. It can be a driving force for the socio-economic development in the industrial and manufacturing sectors (Bernama 2013c). While for Selangor, the study found that there is a negative short-run relationship between both variables. A 1% increase in foreign direct investment can cause a 0.45% decrease in in-migration (Selangor) in the short-run.

For domestic investment, there is a positive relationship for Kuala Lumpur, Penang. A 1% increase in domestic investment can trigger a 1.45% increase in in-migration (Kuala Lumpur), 0.71% (Penang) and 1.38% (Selangor) in the shor-run. Domestic investments into Kuala Lumpur, Penang and Selangor have created many job opportunities and have attracted people in nearby states to migrate to work. While there is a negative relationship between domestic investment and in-migration for Perak in the short-run. A 1% increase in domestic investment can cause in-migration to decrease by 1.09% (Perak) in the short-run. In Perak, the negative relationship between in-migration and domestic investment needs to be reviewed as it may affect the entry of professional workers.

Otherwise, there is a positive short-run relationship between in-migration and household income for Johor and Perak. A 1% increase in household income can cause in-migration to increase by 12.05% (Johor), and 6.05% (Perak) in the short-run. Besides, there is a negative short-run relationship for the state of Penang. A 1% increase in household income can cause in-migration to decrease by 5.15% (Penang) in the short-run. In Penang, the negative relationship between in-migration and household income needs to be reviewed because there is competition to get the job in the short-run and this condition will affect the cost of living.

Looking at the short-run relationship for in-migration with unemployment, there is a negative short-run relationship for Kuala Lumpur, Perak, Penang and Selangor. A 1% increase in unemployment can cause in-migration to decrease by 1.41% (Kuala Lumpur), 3.33% (Perak), 1.45% (Penang), and 0.99% (Selangor) in short-run. In addition, poverty is seen to have a positive relationship between these two variables for Johor, Kuala Lumpur, Malacca, Perak and Selangor. A 1% increase in poverty can cause in-migration to increase by 4.30% (Johor), 4.69% (Kuala Lumpur), 1.1% (Malacca), 5.94% (Selangor) and 3.24 (Perak) in the short-run. For the short-run relationship between migration and labour force participation, there is a positive relationship between these variables for Johor, Kuala Lumpur, Negeri Sembilan, Perak, Penang and Selangor. A 1% increase in labour force participation can cause in-migration to go up by 10.30% (Johor), 55.67% (Kuala Lumpur), 26.45% (Negeri Sembilan), 15.86% (Perak), 9.34% (Penang) and 64.18% (Selangor) in the short-run.

Next, to test the strength of this ARDL model, diagnostic tests were conducted the results of the LM (Chi-sq) and F-statistical diagnostic tests found that all tests were LM test (Serial Correlation), Ramsey's RESET test (Error Specification Regression), Jarque-Bera test (Normal Distribution) and ARCH test (Heteroskedastiity) are not significant at any level of significance (TABLE 5). This shows that the ARDL model for each state is strong. Hence, the Cumulative Sum of Recursive Residual (CUSUM) and Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) tests are continued to test the stability of this model.

The results of the CUSUM and CUSUMSQ test, the results find that both tests are in critical lines at 5% significance levels for all states (APPENDIX B). This shows that there is a stability of the long-run coefficient of ARDL model for each state and according to Pesaran and Pesaran (1997), the stability of the long-run coefficient

TABLE 5. Diagnostic Test

States	LM (Chi-Sq)	F-Statistic	LM (Chi-Sq)	F-Statistic
	Statistic Test: (A) Serial Correlation		Statistic Test: (B) Error Specification Regression	
Johor	0.10 (0.75)	0.04 (0.85)	0.52 (0.77)	0.10 (0.76)
Kuala Lumpur	3.74 (0.15)	2.19 (0.15)	2.17 (0.14)	1.33 (0.27)
Malacca	2.00 (0.16)	0.83 (0.38)	0.66 (0.42)	2.10 (0.17)
Negeri Sembilan	1.37 (0.51)	1.68 (0.22)	0.26 (0.61)	0.63 (0.43)
Perak	0.04 (0.84)	0.01 (0.92)	2.52 (0.28)	0.25 (0.62)
Penang	0.37 (0.56)	1.66 (0.21)	1.68 (0.20)	1.36 (0.27)
Selangor	1.87 (0.17)	1.45 (0.26)	0.06 (0.80)	0.83 (0.39)
States	Statistic Test: (C) Normal Distribution		Statistic Test: (D) Heteroskedasticity	
Johor	0.5455 (0.761)	Not Applicable	0.5842 (0.445)	0.5570 (0.461)
Kuala Lumpur	0.5179 (0.772)	Not Applicable	1.6576 (0.198)	1.6383 (0.211)
Malacca	1.4931 (0.474)	Not Applicable	0.1475 (0.701)	0.1386 (0.712)
Negeri Sembilan	0.7229 (0.697)	Not Applicable	1.2706 (0.260)	1.2394 (0.275)
Perak	0.8549 (0.652)	Not Applicable	2.6858 (0.101)	2.7509 (0.108)
Penang	0.2655 (0.606)	Not Applicable	2.1113 (0.146)	2.1194 (0.156)
Selangor	1.4524 (0.484)	Not Applicable	0.1197 (0.729)	0.1124 (0.740)

Notes: (A) refer to LM test, (B) refer to Ramsey's RESET test, (C) refer to Jarque-Bera test, (D) refer to ARCH test. ***, ** and * are significant level at 1%, 5% and 10.

of estimated is carried out to confirm the suitability of the model used (Maamor & Abdullah 2009).

GRANGER CAUSALITY

TABLE 6 shows the results of causality test, conducted after ARDL test. Overall, foreign investment is seen as a cause for in-migration (FDI → MM) for Johor, Kuala Lumpur, Penang and Selangor while in-migration is seen as a cause for foreign investment (MM → FDI) for Malacca and Perak. The advantages in terms of good facilities such as in Selangor are able to attract more foreign investment to invest (Yaakob & Masron 2010) and thus attract more people to migrate. Domestic investment is also seen as a cause of in-migration (DI → MM) for Johor, Malacca and Selangor while in-migration is the cause of domestic investment inflows (MM → DI) for Kuala Lumpur, Perak and Penang. Then per capita income is seen as the cause for in-migration (HHI → MM) for Johor, Kuala Lumpur,

TABLE 6. Granger-Causality Test

Variables	States						
	Johor	Kuala Lumpur	Malacca	Negeri Sembilan	Perak	Penang	Selangor
lnPOP →lnMM	1.0048	0.7528	2.1563	2.2873	7.8062**	1.8600	6.3460**
lnMM →lnPOP	2.6297*	4.9492**	2.4219	0.2756	15.7066**	4.8663**	3.1322*
lnFDI → lnMM	4.8303**	5.8600**	0.7976	1.2108	1.3248	5.6685**	5.8600**
lnMM →lnFDI	0.4102	0.4958	7.1908**	0.5972	3.5572**	2.1782	0.1049
lnDI → lnMM	2.2734*	1.6335	7.3499**	2.4961	1.7021	0.8894	3.3707**
lnMM→lnDI	2.4762	5.6046**	1.6733	1.2792	3.5634**	5.5695**	0.0539
lnHHI → lnMM	2.7490*	8.3002**	5.3843**	2.2163	3.1222*	3.0686*	4.7232**
lnMM → lnHHI	0.0873	1.1887	0.1602	0.1844	0.8525	0.0203	0.0797
lnUN → lnMM	1.0148	1.1433	4.0692**	0.7656	1.0930	0.3523	2.0996
lnMM→ lnUN	1.3516	2.6617*	0.3147	0.0916	3.1704*	4.7070**	2.6617*
lnPOV→lnMM	0.4356	1.8234	4.7641**	3.1473*	3.9573**	0.8487	3.9522**
lnMM→lnPOV	4.2216**	5.0895**	0.1571	0.0827	1.5942	0.3751	1.2177
lnTB → lnMM	0.6851	2.4470	0.4223	1.0410	3.6856**	2.4031	1.2231
lnMM → lnTB	9.9113**	2.6644*	2.4160	3.6908**	0.4409	3.0860*	2.6644*

Note: ***, ** and * are significant level at 1%, 5% and 10%

Malacca, Perak, Penang and Selangor. The Penang state government has allocated RM 20 million for the purpose of eradicating poverty and also balancing household income in 2012, the income level of households earning RM 600 increased to RM 770 (Pauline & Lem 2012). This led to the increase in-migration to Penang. In addition, unemployment is seen as a cause for in-migration (UN → MM) for Malacca while the in-migration is seen as a cause of unemployment (MM → UN) for Kuala Lumpur, Perak, Penang and Selangor.

Hence, poverty is seen as a cause of in-migration (POV → MM) for Malacca, Negeri Sembilan, Perak and Selangor while in-migration is seen as a cause for poverty (MM → POV) for Johor and Kuala Lumpur. Labour force participation is seen as a cause for in-migration (TB → MM) for Perak while in-migration is seen as a cause for labour force participation (MM → TB) for Johor, Kuala Lumpur, Negeri Sembilan, Penang and Selangor. Next, the population is seen as the cause for in-migration (POP → MM) for Perak and Selangor while in-migration is seen as the cause of the population (MM → POP) for Johor, Kuala Lumpur, Perak, Penang and Selangor. Referring to Rostam et al. (2010a; 2010b), out-migration in Kuala Lumpur to low-density areas such as Hulu Langat, Kuala Langat and Sepang has led to a reduction in population in the state. While in Penang, there was out-migration of the urban population to rural areas or to neighbouring states because of the high cost of living (Noh 2012).

FORECASTING

The study continued with looking at the migration projection trend in until 2020 for all states. The study found that five states experienced a decrease in the number of migration percentages from 2013 to the 2020 projection for Johor, Kuala Lumpur, Malacca, Negeri Sembilan and Selangor. Meanwhile, two other states, Perak and Penang are expected to experience an increase in the percentage of in-migration from 2013 to the 2020 projection (APPENDIX C).

CONCLUSION

Nowadays, in-migration is one of the important phenomena that affect urbanisation and development in the destination area. Indirectly, it will cause the rapid growth of the population, leads to overcrowding, competition for jobs, unemployment, poverty and the formation of new towns in the destination area. Thus, this study aims to analyze the macroeconomic factors that influence the population to migrate to developed states in Malaysia with used annual time series data from 1980 to 2012. From Unit root test, all variables are not significant at the level for constant and constant with the trend, while all variables are significant at first difference for constant and constant with the trend (except labour force participation for Selangor). Looking at the short run relationships, six states (Malacca, Negeri Sembilan, Perak, Selangor, Johor, and Kuala Lumpur) have seen a short run relationship between in-migration and poverty. For the relationship between in-migration and unemployment in the short run, four states (Kuala Lumpur, Perak, Penang, Selangor) have a short run relationship while the other three states (Johor, Penang, Selangor) has a short run relationship between in-migration and foreign investment. Other than that, Johor, Kuala Lumpur and Selangor have a short run relationship between in-migration and destination population while Kuala Lumpur, Perak, Penang and Selangor have a short run relationship between in-migration and domestic investment. Besides that, Johor, Perak and Penang have a short run relationship between in-migration and household income while all developed states (except Malacca) have a short run relationship between in-migration and labour force participation.

For long run relationships, destination population are seen to have a long run impact on the in-migration of several developed states (Kuala Lumpur and Selangor) while household income is seen to have a long run impact on the in-migration of several developed states (Johor and Malacca). Besides that, Kuala Lumpur, Malacca, Penang and Selangor have a long run relationship between in-migration and unemployment while only Malacca has a long run relationship between in-migration and poverty. The next, Kuala Lumpur, Negeri Sembilan and Selangor have a long run relationship between in-migration and labour force participation while foreign direct investments are seen to have a long run impact on the in-migration of several developed states (Kuala Lumpur, Penang, Selangor, Malacca, and Perak). Foreign direct investment and domestic investment factors are also seen to affect in-migration, hence an important driving force for economic growth. These factors open up more job opportunities that attract people from other regions to migrate to the state. Meanwhile, domestic investment is also seen to have a positive long-run impact on in-migration for Johor and Malacca. Looking at the trend of the in-migration for the projection period of eight years until 2020, in-migration trend is expected to decrease for the five states of Johor, Malacca, Negeri Sembilan, Selangor and Kuala Lumpur. For Penang and Perak, the in-migration trend into these states is increased until 2020.

For certain situation, in-migration may give a good impact (job vacancies can be filled, entry of professional workers), but sometimes, in-migration may give a bad impact (unemployment, poverty). Thus, to promote the economic growth of a state, foreign direct investment and domestic investment for development sector should be intensified to improve household incomes in the region. Besides that, Perak and Selangor need to improve the existing policies to encourage foreign

direct investment and domestic investment to enter, while Johor, Kuala Lumpur, Malacca, Negeri Sembilan and Penang need to maintain policies or improve the existing policies to attract more investors to enter. The incoming of foreign and domestic investors will open more jobs for the citizens in the area as well as provide opportunities for residents from nearby areas to migrate. In addition, the government also needs to develop a new area in the interior of the states such as developing public universities, establish industrial zones or develop the agricultural sector in rural areas to encourage residents in the area of origin to stay put and do not migrate out from that states.

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Nor Ermawati Hussain*
School of Social and Economic Development
Universiti Malaysia Terengganu
21030 Kuala Nerus Terengganu
MALAYSIA
E-mail: ermawati@umt.edu.my

Mohd Shahidan Shaari
School of Business Innovation and Technopreneurship
Universiti Malaysia Perlis
Pengkalan Jaya, Jalan alor-Setar-Kangar
01000 Kangar Perlis
MALAYSIA
E-mail: shahidanshaari@unimap.edu.my

Noor Haslina Mohamad Akhir
School of Social and Economic Development
Universiti Malaysia Terengganu
21030 Kuala Nerus Terengganu
MALAYSIA
E-mail: haslin@umt.edu.my

Diana Nabila Chau Abdullah
Faculty of Business, Economicsand Accountancy
Universiti Malaysia Sabah
Jalan UMS, 88400 Kota Kinabalu Sabah
MALAYSIA
E-mail: diananabila@ums.edu.my

*Corresponding author

APPENDIX A

TABLE 1. Unit Root Test

Variables	Johor				Kuala Lumpur				Malacca			
	Constant		Constant + Trend		Constant		Constant + Trend		Constant		Constant + Trend	
	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference
lnMM	-0.86	-4.67***	-2.29	-4.72***	-1.52	-5.90***	-3.21	-5.78***	-2.08	-5.77***	-2.91	-5.46***
	(0.79)	(0.00)	(0.43)	(0.00)	(0.51)	(0.00)	(0.10)	(0.00)	(0.26)	(0.00)	(0.17)	(0.00)
lnPOP	-2.35	-3.81**	0.01	-4.32**	-1.94	-4.09***	-1.91	-4.35**	0.18	-4.70***	-2.29	-4.74***
	(0.16)	(0.01)	(0.99)	(0.01)	(0.31)	(0.00)	(0.62)	(0.01)	(0.97)	(0.00)	(0.43)	(0.00)
lnFDI	-1.69	-3.85**	-2.42	-3.90**	-2.26	-4.29***	-1.75	-4.99***	-1.62	-6.25***	-3.11	-6.25***
	(0.43)	(0.01)	(0.36)	(0.02)	(0.19)	(0.00)	(0.70)	(0.00)	(0.46)	(0.00)	(0.12)	(0.00)
lnDI	-1.87	-6.68***	-2.49	-4.07**	-1.91	-4.14***	-2.62	-3.96**	-2.15	-7.95***	-2.55	-3.81**
	(0.34)	(0.00)	(0.33)	(0.02)	(0.32)	(0.00)	(0.27)	(0.02)	(0.23)	(0.00)	(0.30)	(0.03)
lnHHI	-0.58	-3.34**	-2.19	-3.30*	-0.24	-4.05***	-2.95	-3.93**	0.28	-3.56**	-2.76	-3.59**
	(0.86)	(0.02)	(0.48)	(0.09)	(0.94)	(0.00)	(0.16)	(0.02)	(0.97)	(0.01)	(0.22)	(0.05)
lnUN	-1.80	-3.43**	-2.35	-5.67***	-2.46	-3.38**	-2.50	-3.37*	-0.31	-3.89**	-2.42	-4.03***
	(0.37)	(0.02)	(0.40)	(0.00)	(0.14)	(0.02)	(0.33)	(0.08)	(0.91)	(0.01)	(0.36)	(0.02)
lnPOV	-0.56	-3.90**	-2.54	-3.83**	-1.62	-2.97**	-1.17	-4.28**	0.67	-2.84*	-3.08	-3.42*
	(0.86)	(0.01)	(0.31)	(0.03)	(0.46)	(0.05)	(0.90)	(0.01)	(0.99)	(0.06)	(0.13)	(0.07)
lnTB	-0.56	-3.90**	-1.81	-4.04**	-2.43	-3.53**	-2.83	-4.10**	-1.60	-4.86***	-3.19	-9.61***
	(0.86)	(0.01)	(0.68)	(0.02)	(0.14)	(0.01)	(0.20)	(0.02)	(0.47)	(0.00)	(0.11)	(0.00)

Note: ( ) is probability, ***, ** and * are significant level at 1%, 5% and 10%.

Variables	Negeri Sembilan				Perak				Penang			
	Constant		Constant + Trend		Constant		Constant + Trend		Constant		Constant + Trend	
	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference
lnMM	-1.70	-6.40***	-2.78	-6.40***	-1.74	-5.20***	-2.39	-3.83**	-2.25	-4.63***	-2.87	-4.57**
	(0.42)	(0.00)	(0.21)	(0.00)	(0.40)	(0.00)	(0.38)	(0.03)	(0.19)	(0.00)	(0.19)	(0.01)
lnPOP	-0.61	-5.98***	-3.22	-4.39**	-1.19	-3.37**	-2.55	-3.31*	0.12	-3.31**	-2.08	-3.278*
	(0.85)	(0.00)	(0.10)	(0.01)	(0.67)	(0.02)	(0.30)	(0.08)	(0.96)	(0.02)	(0.53)	(0.09)
lnFDI	-1.74	-2.79*	-1.56	-3.24*	-1.92	-3.92**	-1.70	-4.08**	-1.85	-4.84***	-2.98	-4.79***
	(0.40)	(0.07)	(0.79)	(0.09)	(0.32)	(0.01)	(0.73)	(0.02)	(0.35)	(0.00)	(0.15)	(0.00)

lnDI	-0.85	-3.01**	-2.70	-5.95***	-2.42	-6.65***	-2.67	-4.90***	-1.54	-4.98***	-3.05	-4.88***
	(0.79)	(0.05)	(0.24)	(0.00)	(0.23)	(0.00)	(0.25)	(0.00)	(0.50)	(0.00)	(0.14)	(0.00)
lnHHI	-0.21	-4.52***	-2.92	-4.41**	-0.19	-5.83***	-2.3	-3.86**	-0.76	-3.70**	-2.01	-3.69**
	(0.93)	(0.00)	(0.17)	(0.01)	(0.93)	(0.00)	(0.43)	(0.03)	(0.82)	(0.01)	(0.57)	(0.04)
lnUN	-2.30	-3.85**	-2.72	-3.90**	-1.71	-4.442***	-2.78	-4.36**	-1.94	-4.180***	-2.31	-4.10**
	(0.18)	(0.01)	(0.24)	(0.02)	(0.42)	(0.00)	(0.21)	(0.01)	(0.31)	(0.00)	(0.41)	(0.02)
lnPOV	0.18	-4.50***	-3.07	-4.69**	0.50	-3.71**	-2.56	-3.76**	-1.02	-4.13***	-2.20	-4.08**
	(0.97)	(0.00)	(0.13)	(0.04)	(0.98)	(0.01)	(0.30)	(0.03)	(0.73)	(0.00)	(0.47)	(0.02)
lnTB	-2.34	-4.90***	-2.53	-4.86***	-1.85	-5.44***	-2.89	-5.85***	-1.78	-4.20***	-2.72	-4.13**
	(0.17)	(0.00)	(0.31)	(0.00)	(0.35)	(0.00)	(0.18)	(0.00)	(0.38)	(0.00)	(0.2)	(0.01)

Note: ( ) is probability, ***, ** and * are significant level at 1%, 5% and 10%.

Variables	Selangor			
	Constant		Constant + Trend	
	Level	First Difference	Level	First Difference
lnMM	-1.56	-4.67***	-3.20	-4.53**
	(0.49)	(0.00)	(0.10)	(0.01)
lnPOP	-0.89	-2.94**	-1.32	-5.15***
	(0.78)	(0.05)	(0.86)	(0.00)
lnFDI	-1.65	-4.43***	-1.94	-4.50**
	(0.44)	(0.00)	(0.61)	(0.01)
lnDI	-1.82	-6.32***	-2.74	-6.45***
	(0.36)	(0.00)	(0.23)	(0.00)
lnHHI	-0.59	-3.52**	-2.28	-3.56**
	(0.86)	(0.01)	(0.43)	(0.05)
lnUN	-2.42	-3.76**	-2.45	-3.71**
	(0.14)	(0.01)	(0.35)	(0.04)
lnPOV	-0.11	-3.93**	-2.75	-3.87**
	(0.94)	(0.01)	(0.22)	(0.03)
lnTB	-1.84	-2.30	-2.78	-4.20**
	(0.36)	(0.18)	(0.22)	(0.01)

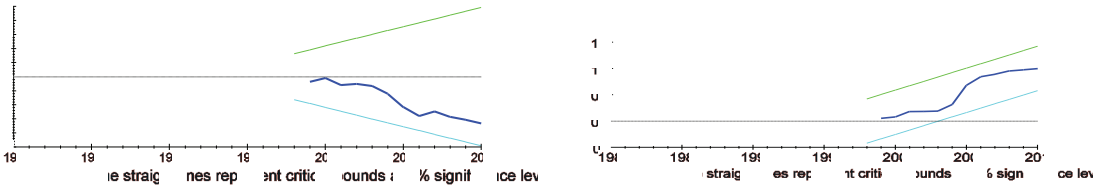
Note: ( ) is probability, ***, ** and * are significant level at 1%, 5% and 10%.

APPENDIX B

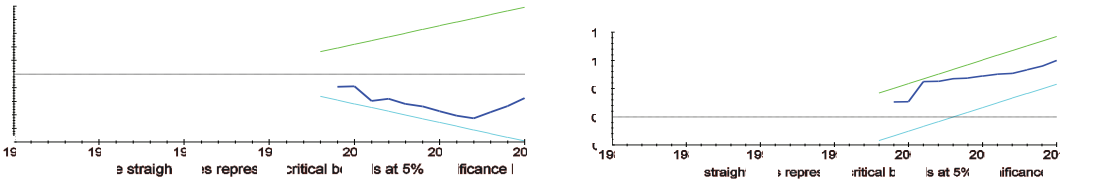
CUSUM AND CUSUMSQ

TABLE 1. (*cont.*)

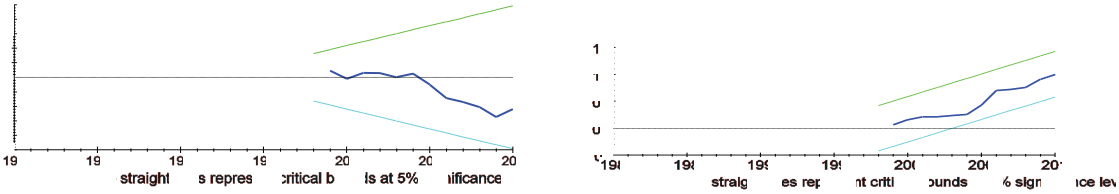
Johor



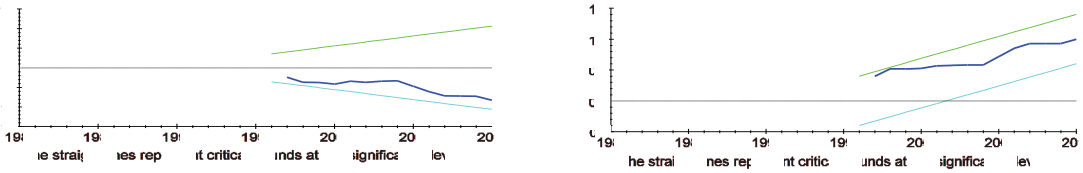
Kuala Lumpur



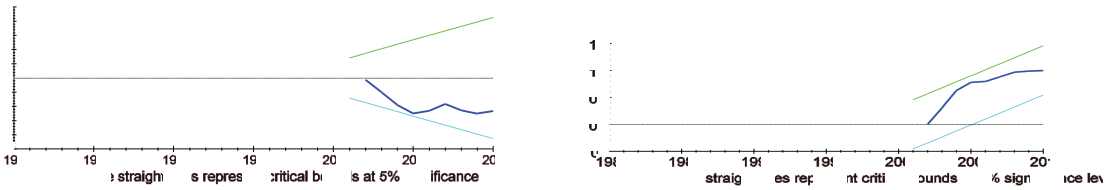
Malacca



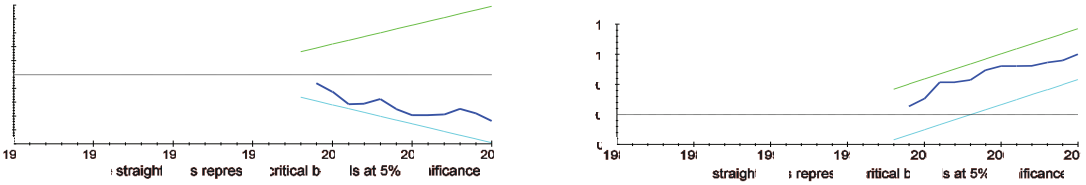
Negeri Sembilan



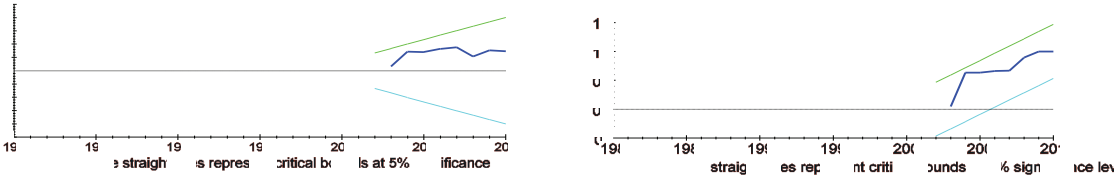
Perak



Penang

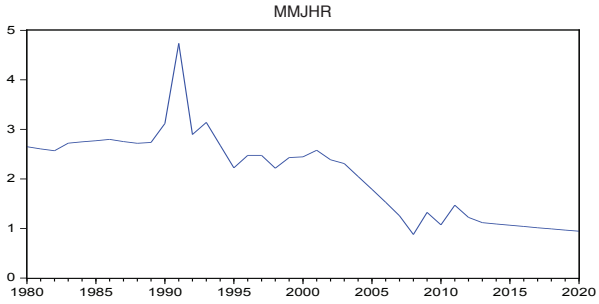


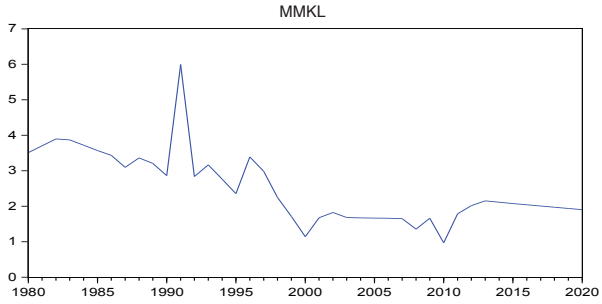
Selangor

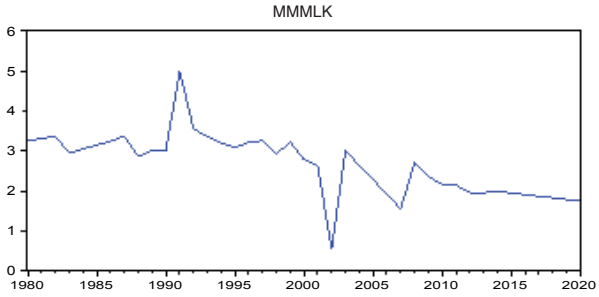


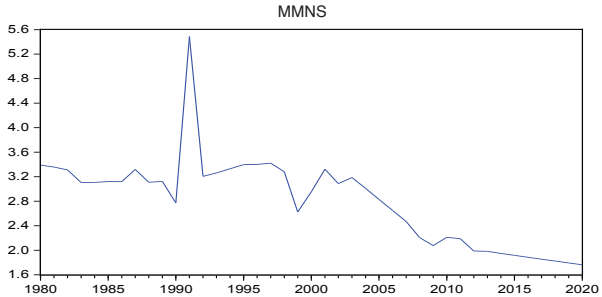
APPENDIX C

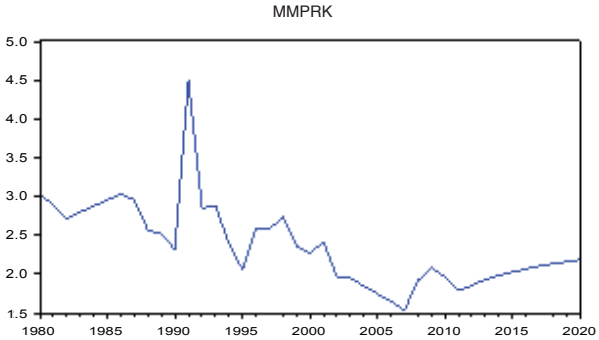
FORECASTING UNTIL YEAR 2020

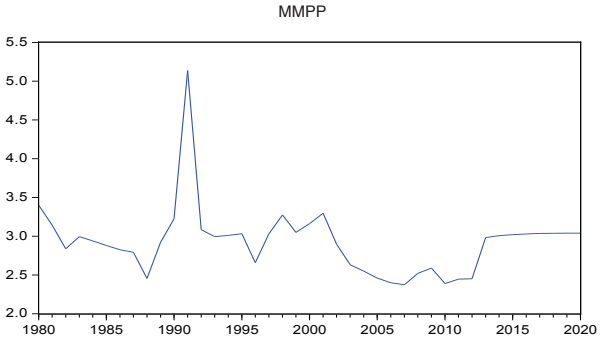


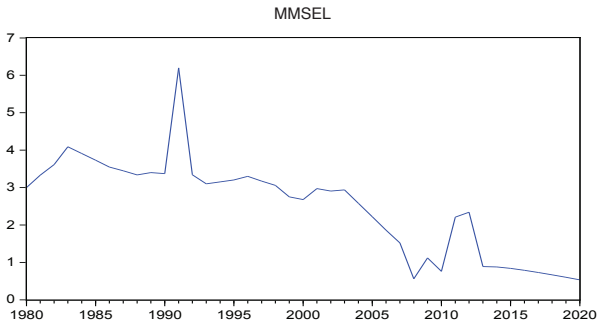












Notes: JHR=Johor, KL= Kuala Lumpur, MLK = Malacca, NS= Negeri Sembilan, PRK= Perak, PP= Penang, SEL= Selangor