The Determinants of Rural-Urban Migration: Malaysia Case Study

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Abstract - The purpose of this study is to determine the determinants of rural-urban migration in Malaysia. The annual data has obtained from 1988-2017 in Malaysia. There are various empirical approaches that have been employed in this study which are Augmented Dickey Fuller unit root test, Johensen-Jesulius Cointegration test, Vector Error Correction Model and Granger Causality test. The result shows there is absence of short run relationship between the population, household income, unemployment and poverty however the long run relationship between the variables are presence in rural while the urban has a short run and unidirectional causal relationship which is from the population to household income and the long run relationship between the variables also presence.

Keywords **-** Rural-Urban Migration; Malaysia; Time Series Analysis; Poverty; Population.

I. INTRODUCTION

The migration of migrants from rural areas to urban areas is an important process of the urbanization in developing countries. According to Purnomo (2009), the rural-urban migration is a process which will indirectly affect the urbanization and development of a country. This process is a natural process and it will deliver to the workforce destination. Due to this process, it impacts on the population movement flows and result in the rapidly growing population of the development of major cities. The overall data from The World Bank (2018) showed the total urban population in Malaysia has rose about from 48.2% or 8.21 million in 1988 to 76% or 24.03 million in 2017.

According to Yaakob and Masron (2010), the pull factors had an impact on migration process from rural areas to urban especially to cities or towns with the attraction of employment, education, social services etc. Other than that, other push factors from rural areas such as living environments, working conditions and environments, development opportunities and etc. also impact on this process (Lehmann et al., 2008). Urbanization is continuously occurring in a country which means that people migrate to cities or towns for a better standard of living. In other words, people migrate to urban areas because of people desire to find a better employment opportunities, educational opportunities and so on and this will result in development of a country (UNFPA, 2005). In addition, migration also is the way for people to get out from poverty trap and this will causing rapidly growing population of urban areas (Sari, 2009).

Internal migration able help migrants to increase their income level, enhance work experiences and also improve the life satisfaction level (Chamratrithirong, 2007; Chowdury et al, 2012). However, Todaro (1980) argued that the rapid migration is not a best solution to solve the problem of labor demand in urban areas. According ro Chamratrithirong (2007) and Todaro (1980), the rapid internal migration bring the rapid growth of population especially in urban areas and this phenomenon will motivate the people from rural areas migrate to urban areas in a short period of time. This will cause worsens in structural imbalances in terms of supply in urban and rural areas and also the growth of job seekers in urban areas imbalances.

Most migrants are more likely come from the former residents of poorest rural areas or from larger centers which with highest education level. There have many determinants affecting the movement of migrants from rural areas to urban, from between urban, from between rural areas and from urban to rural areas in Malaysia. Household income is the one of the factor on affecting the migrants move from the rural areas. It can be proven from the data of Department of Statistics (2018). For the mean monthly gross household income, household income for urban and rural areas, the household income gap between the two regions is very significant although total of household income for the two regions is seen to increase from year to year. In the year 1988, the mean of monthly gross income for urban household is RM 1,547 while the mean of monthly gross income for rural household is RM 919. For the year 2017, the average of monthly urban gross household income is RM 7,980 while the average of monthly rural gross household income is RM 4,660.Thus, it can be concluded that the household income gap for rural and urban areas is significant from 1988 until 2017. Other than that, unemployment rate and poverty rate also plays a role on the direction of migration.

II. LITERATURE REVIEW

Dahlan and Abdullah (1977) examined a study on trends of rural-urban migration in Peninsular Malaysia and its effects on migrant families. They used descriptive analysis to explain their observation on the trends of rural-urban migration in Peninsular Malaysia and its effects on migrant families. In this study, they concluded a proper and conductive home environment was the main factor affected the direction and patterns of rural-urban migration in Peninsular Malaysia because everything begins in the home. Thus, family plays an important role in community resource and they suggest government to have proper concern and develop family health development of migrants especially the poverty migrants.

A study conducted by Menon (1987) on job transfer as a determinant of migration in Malaysia. The researcher analyzed the migrants have to migrate most probably due to their jobs and careers depend on it. The jobs of most migrants are public servants, with managerial positions and with higher education. In other words, this means that forced employment are the main factor of migration in Malaysia.

Siwar and Yusof Kasim (1997) claimed that Malaysian urban poverty is lower than the rural poverty. However, this might be because of the way poverty is measured. Using income alone may not be sufficient enough. The living cost in rural and urban areas is different. Using a standard income measure will result in a lower poverty rate in urban areas than in rural areas. Using other socio-economic variables such as housing conditions, amenities and so on in measuring the incidence of poverty, might find higher poverty proportion in urban areas.

Rostam (2006) investigated on the patterns of population migration towards Klang Valley metropolitan peripheral areas in 1991 and 2000. Klang Valley experienced rapid growth of population due to Klang Valley expansion in the manufacturing and service activities. From the data, it can be seen that most migrants of Klang Valley were from Federal Territory Kuala Lumpur. In this study, the researcher analyzed the key factors affected the migrants migrate towards Klang Valley were the densely populated central areas of the metropolitan city, the high rent and price of houses in the central areas and the government decentralize policy which relocating the metropolitan city's functions to the peripheries.

Jali (2009) investigated on the movement of population in Malaysia in 1991 and 2000. He analyzed the movement of population categorized by three different levels which are the state level, the district level and the rural-urban level. The results showed that the short distance migration in Malaysia has decreased in recent years while the long-distance migration has increased most probably due to the higher living standard and better transportation infrastructures and facilities. He also found that the population of rural to rural migration higher than the population of rural to urban migration. He concluded that the rural to urban migration was no longer dominant in Malaysia but was the urban to urban migration. On the other hand, Yaakob, Masron and Masami (2010) examined the trends of urban migration in Malaysia from 1911 to 2000. From results of this study, he found that rapid population growth in urban areas of Malaysia occurred last nine decades especially during the 1980s and 1990s because the urbanization level in Malaysia rose about 18.4 percent from 1911 to 1970 and roe again

about 33.4 percent from 1970 to 2000. The rapid growth of urban population caused many problems to the basic needs of people such as housing, health, education, and sanitation facilities but the most serious problems were urban poverty and housing for the lower income group.

Hussain, Abdullah, and Abdullah (2014) studied on the relationship between rural and urban migration, household income and unemployment in Malaysia by using time series data from 1980 to 2011. The data used by the researchers showed that migration is positively affected by the household income level and negatively affected by unemployment rate for rural and urban migration in Malaysia. The methods they applied to analyze the data of the research are Augmented Dickey–Fuller (ADF) Test, Johansen Co-integration, Vector Error Correction Model (VECM) and Granger causality test to analyze the data of the research. For the unit root test result, all variables are significant at 5% and 10% significant level based on ADF test. The cointegration test result showed that at least one variable has a long run relationship with migration and the VECM showed that at least one variable has a short run relationship. For the Granger causality test, the results showed that migration is granger cause to household income and unemployment for the urban area while household income and migration are granger cause to unemployment and only household income is granger cause to migration for the rural area.

Malik (2015) examined the trends of rural-urban migration in Pakistan and its impacts on the social and cultural dimensions of the destination place. From the results of the study, he found that the trends of rural-urban migration in Pakistan rose largely and continuously from 2001 to 2011. This phenomenon caused the crowdedness in the urban centers and decreased the per capita resources available in the cities. This was due to government Pakistan was only focused on the development of developed cities and ignored the decline in the available facilities and resources are a major reason for the continuous development of urban.

III. DATA DESCRIPTION

The time period of this study is from year 1988 until year 2017 implicates 30 years which consist of 30 observations, used to examine the determinants of rural-urban migration in Malaysia. The data were drawn from the Department of Statistics. In this study, annually data is being selected to find the variables in term of percentage (%) for population, unemployment, poverty and Ringgit Malaysia (RM) for household income. The independent variables are household income, unemployment and poverty while the dependent variable is population in both urban and rural areas (as a proxy of rural-urban migration).

IV. MODEL SPECIFICATION

The theoretical model for this study is modified based on the model used by Hussain, Abdullah, and Abdullah (2014). From their studies, they have used certain variables for their empirical testing such as the household income and unemployment. However, this study will add on variable such as poverty, in order to investigate the relationship towards migration. In this study, the equation can be express as following:

$$POP_{it} = \alpha + \beta_1 HHI_t + \beta_2 UNEM_t + \beta_3 POV_t + \mathcal{E}$$

Where,

POP_{it} is the population for rural-urban of i and period of t,
α is the constant term,
β denoted as coefficients,
β_1, β_2, β_3 and β_4 are parameters,
$\mathcal{E}$ is the error term.
The set of independent variables include:

HHI_t= household income for period of t

$UNEM_t$= unemployment for period of t
POV_t= poverty for period of t

V. METHODOLOGY

A. Augmented Dickey Fuller (Adf) Test

Dickey and Fuller (1979) who developed by Augmented Dickey-Fuller (ADF) unit root test would be employed in this study. The unit root tests must as the first test to run before run the cointegration test and Granger causality test. The purpose of unit root test is used for examine the stationary of times series data and first difference. The null hypothesis represents that the existence of unit root. Then, the variables are considered as non-stationary. Conversely, the alternatives hypothesis implies that there is no unit root which considered the series is stationary. To test the unit root, Dickey Fuller test (ADF) Act 1979 will be used for this method. ADF unit root test method is as follows:

$$\Delta Y_t = \alpha_0 + \Sigma_{i=1}^{a} \theta_1 Y_{t-1} + \Sigma_{j=1}^{b} \theta_j \Delta Y_{t-1} + \varepsilon_t$$

Without constant and trend:
$$\Delta Y_t = \delta Y_{t-1} + \mu_t$$

With constant:
$$\Delta Y_t = \alpha + \delta Y_{t-1} + \mu_t$$

Constant and trend:
$$\Delta Y_t = \alpha + \beta T + \delta Y_{t-1} + \mu_t$$

Where,
Δ is the first differentiation,
ε_t and μ_t are stationary random error.

The ADF test use t-statistic to examine the stationary of variables. The optimum lag length is chosen on Akaike Information Criterion (AIC). The decision of significance variable is based on critical value in 1%, 5% and l0% significance level. Based on the hypothesis of the unit root test, hypothesis H_0will not be rejected which is meaning the variable is not stationary and have a unit root if the t-statistic obtained is greater than the critical value. Conversely, hypothesis H_0 is rejected which is meaning there is no unit root and the variables is stationary if the t-statistic is less than the critical value.

B. Johansen-Juselius (J&J) Cointegration Test

The purpose of this test in this study is to examine the long run relationship between the rural-urban migration and independent variables which are household income, unemployment, population and literacy. There are two tests that are required to carry out as part of the JJ test in order to determine the number of cointegrating vectors. The two tests which include the likelihood ratio Trace test and the Maximum Eigenvalue (λ- max) test (Johansen & Juselius, 1990). Trace test likelihood ratios is expressed as below equation.

$$T_{trace} = -T\sum_{i=r+1}^{n} \ln\left(1 - \lambda_{r_{+1}}\right)$$

Where,
T indicates the number of valid observations and
λ is the r^{th} largest estimated eigenvalue.

As for the Maximum Eigenvalue test is expressed as following:

$$\lambda_{max} = -TL\left(1 - \hat{\lambda}_{r_{-1}}\right)$$

Where,
T is the number of valid observations for the estimation use and
$\hat{\lambda}_{r_{-1}}$ is the largest eigenvalue at r-1.

From the study conducted by Johansen and Juselius (1990), among this two test for cointegration testing the Maximum Eigenvalue test is much better and reliable than the likelihood ratio Trace test.

C. Vector Error Correction Model (VECM)

The VECM is used to analyze the existence of long run relationship between the variables after the cointegration is identify in the JJ cointegration test. The VECM model is as shown as below:

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^{n} \beta_1 \, \Delta Y_{t-i} + \sum_{i=1}^{n} \beta_2 \, \Delta X_{t-i} + \gamma_1 ECT_{t-i} + \varepsilon_t$$

$$\Delta X_t = \varphi_0 + \sum_{i=1}^{n} \varphi_1 \, \Delta X_{t-i} + \sum_{i=1}^{n} \varphi_2 \, \Delta Y_{t-i} + \gamma_2 ECT_{t-i} + \mu_t$$

where Δ defined as the lag operator, $\alpha_0, \varphi_0, \beta_1, \beta_2, \varphi_1,$ and φ_2 represent the estimated coefficients, meanwhile n represent the optimal lags length, ε_t and μ_t are the serially uncorrelated random error terms, γ_1 and γ_2 measure as a single period response of the shock towards back to equilibrium.

D. Granger Causality Test

Finally, Granger causality test would be employed to investigate the short run causality between the variables. The null hypothesis H_0 will not be accepted if the variables are statistically significance at 1%, 5% or 10% level and probability is less than the significance level. Therefore, it can conclude that there are Granger causes between the variables. In contrast, the null hypothesis H_0 will be accepted if the variables are insignificance at 1%, 5% or 10% level and the probability is greater than the significance level. Thus, it concludes that those variables do not Granger cause each other. If the variable X is granger cause of Y and Y is also the cause of X, its means that the past of X help in anticipating the future Y. Similarly, the last value of Y also assists in the expected future value of X.

VI. RESULTS AND DISCUSSIONS

A. Unit Root Test

According to Granger and Newbold (1974); Phillips and Perron (1988), the results of regression results may be spurious if the variables has unit root (non-stationary). In order to avoid spurious estimation results, ADF unit root tests are selected to verify the stationarity or non-stationarity of the series of POP, HHI, UNEM and POV. The level and first differences of POP, HHI, UNEM and POV for rural and urban are checked and the results are shown in Table 1.

TABLE 1: Results on Unit Root Test of Rural and Urban

	Rural		Urban	
Variables	Intercept	Trend and Intercept	Intercept	Trend and Intercept
		A: Level		
POP	-2.860859 (0)	-2.249120 (0)	0.223368 (0)	-2.317056 (1)
	[-2.967767]	[-3.574244]	[-2.967767]	[-3.580623]
HHI	1.974975 (1)	0.181519 (1)	1.604772 (2)	-0.960161 (1)
	[-2.971853]	[-3.580623]	[-2.976263]	[-3.580623]
UNEM	-6.455702 (0)*	-5.555331 (0)*	-4.373261 (1)*	-4.070438 (1)*
	[-2.967767]	[-3.574244]	[-2.971853]	[-3.580623]
POV	-1.027880 (0)	-2.613828 (0)	-2.371543 (0)	-2.353278 (0)
	[-2.967767]	[-3.574244]	[-2.967767]	[-3.574244]
		B: First Differences		
ΔPOP	-4.449985 (0)*	-4.924068 (0)*	-4.586092 (0)*	-4.673364 (0)*
	[-2.971853]	[-3.580623]	[-2.971853]	[-3.580623]
ΔHHI	-1.560849 (0)*	-2.673436 (0)*	-2.342789 (0)	-3.243400 (1)
	[-2.971853]	[-3.580623]	[-2.971853]	[-3.587527]
ΔUNEM	-4.776669 (0)*	-4.699978 (0)*	-4.520707 (1)*	-4.569872 (1)*
	[-2.971853]	[-3.580623]	[-2.976263]	[-3.587527]
ΔPOV	-4.839497 (1)*	-4.792107 (1)*	-5.541433 (0)*	-5.804476 (0)*
	[-2.976263]	[-3.587527]	[-2.971853]	[-3.580623]

Notes: The ADF tests are based on the null hypothesis of unit roots (non-stationary). Asterisks (*) indicate statistically significant at 5 percent level. Figure in parentheses are lag length. ADF refer to Augmented Dickey-Fuller unit root tests. The optimal lag length for ADF test is selected using the AIC. The asymptotic and finite sample critical values for ADF are obtained from MacKinnon (1996). The ADF test examines the null hypothesis of a unit root against the stationary alternative. Δ denotes first difference operator.

As Engle and Granger (1987) highlighted, only variables with the same order of integration could be examined for cointegration. Results in both tables showed that both of the tests are non-stationary which denoted at I(0). At first difference, in Table 1, all of the variables are stationary which denoted at I(1) in rural areas, while HHI is found non stationary in urban areas. These results are in line to the statement that most of the macroeconomics time series is stationary after first differencing but has unit root at level form (Nelson and Plosser, 1982).

B. Johansen And Juselius Cointegration Test

Table 2 displayed the results of the Johansen Juselius Cointegration test for rural and urban. The lag interval used is one lag.

TABLE 2: Results on Johansen and Juselius Cointegration Test for Rural and Urban

		RURAL		
Hypothesized No. of CE(s)	Max-Eigen statistic	0.05 critical value	Trace statistic	0.05 critical value
r=0	39.56867*	27.58434	88.20585*	47.85613
r≤1	33.92195*	21.13162	48.63718*	29.79707
r≤2	13.40296	14.26460	14.71523	15.49471
r≤3	1.312269	3.841466	1.312269	3.841466
		URBAN		
Hypothesized No. of CE(s)	Max-Eigen statistic	0.05 critical value	Trace statistic	0.05 critical value

r=0	49.48647*	27.58434	85.91512*	47.85613
r≤1	20.10958	21.13162	36.43046*	29.79707
r≤2	14.87606	14.26460	16.32087*	15.49471
r≤3	1.44811	3.841466	1.444811	3.841466

Notes: Asterisks (*) denote statistically significant at 5% level. Trace test indicates 2 cointegrating equation(s) at the 0.05 level and denotes rejection of the hypothesis at the 0.05 level while Max-eigenvalue test indicates 2 cointegrating equation(s) for rural and 1 cointegrating equation for urban at the 0.05 level and denotes rejection of the hypothesis at the 0.05 level.

Based on the result, we have enough statistical evidence to reject the null hypothesis at 5% level. Trace test indicated that there are two cointegrating vectors at 5% level of significance. From the results above, we can identify that there are long run equilibrium exists between the variables. Since there are cointegrating vectors exist, the VECM framework is adopted to examine the long run relationship between the variables. In particular, there are 2 cointegrating vectors found in rural, and only 1 cointegrating vector is found in urban.

C. Vector Error Correction Model And Granger Causality

Table 3 showed that the Granger Causality result that estimated through Vector Error Correction Model (VECM) and the Error Correction Term (ECT) for each variable of rural and urban. Based on the results, there is no relationship exists between POP, HHI, UNEM and POV in the short run. The ECT of POP in the tested model of rural is less than 1, statistically significant at 5 percent level of significant (equal to critical value of 1.96) and negative value. Thus, POP solely bear the brunt of short run adjustment to bring about the long run equilibrium. The ECT coefficient of POP is 39.4 percent. It means that coefficient of POP need 39.4 percent of adjustment to long run equilibrium in a year shows that Malaysia needed about 2.54 years to bring back to equilibrium.

TABLE 3: Results on Vector Error Correction of Rural Migration.

RURAL						
Dependent variables	ΔPOP	ΔHHI	ΔUNEM	ΔPOV	ECT	
	x^2 statistic(p-value)				Coefficient	t-ratio
ΔPOP	-	0.000882	0.270891	0.049900	-0.393634*	-2.70469
		(1.99171)	(2.60769)	(2.04031)		
ΔHHI	14.05584	-	39.34591	2.926443	-56.68262	-0.84678
	(0.17031)		(0.82349)	(0.26015)		
ΔUNEM	1.221862	0.001972	-	0.026125	0.632260	2.86564
	(4.49163)	(2.93669)		(0.70461)		
ΔPOV	1.093580	0.002946	1.341891	-	4.110418	3.89641
	(0.84078)	(0.91735)	(1.78210)			
URBAN						
Dependent variables	ΔPOP	ΔHHI	ΔUNEM	ΔPOV	ECT	
	x^2 statistic(p-value)				Coefficient	t-ratio
ΔPOP	-	0.000195	0.333784	0.191646	-0.355232*	-4.26362
		(0.84708)	(3.97364)	(2.86630)		
ΔHHI	7.356934	-	59.84285	74.17799	-46.09713	-0.56263
	(0.04994)*		(0.72447)	(1.12818)		
ΔUNEM	0.423130	0.000512	-	0.143144	-0.068090	-0.30940
	(1.06932)	(0.84245)		(0.81053)		
ΔPOV	1.020205	0.000399	0.020550	-	0.357152	1.30582
	(2.07447)	(0.52893)	(0.07452)			

Notes: The x^2-statistic tests the joint significance of the lagged values of the independent variables, and the significance of the error correction term (s). The figures in parentheses are the p-values. Asterisks (*) indicate statistically significant at 5 percent level.

In urban areas, POP can Granger cause HHI in the short run. It means that POP has a unidirectional relationship with HHI. The ECT of POP in the tested model is less than 1, statistically significant at 5 percent level of significant (equal to critical value of 1.96) and negative value. POP solely bear the brunt of short run adjustment to bring about the long run equilibrium. The ECT

coefficient of POP indicates that the speed of adjustment to go back to the equilibrium is 35.5 percent, thus this implies that it takes about 2.82 years to bring back to the equilibrium.

VII. CONCLUSION

Generally, both rural and urban areas in Malaysia have seen a decrease in overall population but urban population still remain at positive while the houses of rural population drop from positive to negative. According to the data of The World Bank (2018), the rate of change of rural population decreased in unstable condition from 1.50% to -1.19% while the rate of change of urban population also decreased in unstable condition from 4.63% to 2.25% although total urban population keep increasing. There are many determinants affecting the rural-urban migration in Malaysia.

Malaysia actually does not have a direct policy on internal migration, but economic policies such as development of Bumiputera Commercial and Industrial Community under the Malaysia Plans, as well as the regional corridor development do have a significant impact on migration. For example, in 1999, the seat of government was shifted from Kuala Lumpur to Putrajaya and the Multimedia Super Corridor was created to reduce overcrowding and congestion in the Klang Valley. There are a number or urban management policies and these include the National Urbanisation Policy, National Physical Policy, National Housing Policy, and strategies for managing urban growth while enhancing productivity and efficiency of small towns and rural areas. More efforts are needed to promote the integration of migrants at the place of destination. The impact and effectiveness of population redistribution policies/ programmes also need to be evaluated.

In order to undertake this study on policy and planning implications, government needs to review the development policies in Malaysia for several years. The policy changed since independence from agricultural to industrial. There are many policies that have to be looked at such as the Agricultural Policy, the National Economic Policy, the Industrial Development Plan, the National Development Policy, the five year Malaysia Plans and many more. There would help the policy makers and planners to create a better plan for the future to minimize the problems caused by migration and urban population growth.

The unemployment also is one of the determinants of rural-urban in Malaysia. The size of the educational system would also influence the amount of unemployment. If employers hire better-educated workers preferentially, the education of an additional worker will lower the number of urban jobs available to uneducated workers by one, reduce the uneducated urban labor force by something more than one, and thereby lower the total number of urban unemployed. These workers will return to agriculture and add to national output there, while the educated workers might be more productive in the urban sector than their uneducated. Counterparts and further contribute to national output. Hence, we derive the somewhat paradoxical result that over education of the labor force might have the beneficial effect of both lessening urban unemployment and increasing national income in both the rural and the urban sectors.

Job hiring in the modern sector are more than the number of jobs, which primarily influences workers' location decisions. We have seen that a small increase in the number of jobs has a much larger proportional effect on job hiring and induces substantial rural-urban migration and increases the rate of urban unemployment. Thus migration can be stemmed simply by not growing so fast. For countries which need or choose to develop by enlarging their modern sectors rather than by improving the well-being of those in the traditional sectors, this creates a harsh dilemma: the cost of more rapid growth is the enrichment of some (the fortunate few who are hired for the newly- created jobs), the impoverishment of others (those who respond to the new incentives by choosing a high unemployment labor market search strategy), and greater inequality in the distribution of income. Hopefully, this conflict between growth and distributional objectives might be moderated by improving the functioning of labor markets as suggested above or by designing a tax- transfer system following Bhagwati and Srinivasan's guidelines. Thus, Harris and Todaro's pessimistic conclusion about the undesirability of modern-sector job creation may not be fully justified.

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