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INCOME INEQUALITY ACROSS STATES IN MALAYSIA

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Abstract

This paper examines income differentials across the 16 states/territories in Malaysia, using quantile regression of income per capita on a nationally representative sample of 24,463 households in 2014. The results show that the vast differentials in income per capita across states are attenuated after taking into account urban-rural and ethnic distribution, but remain significant. Income differentials across states vary at different levels of income, being more pronounced at the lower ends of the distributions. States and territory in the central region had the highest income. The three states in the southern regions fared better than those in the northern region (except Penang), and the eastern region as well as East Malaysia. Other variables such as level of urbanisation, the educational level, migration, employment structure, and female labour force participation may also affect income differentials across states.

Keywords: Income, distribution, differentials, inequality, states, regions, ethnicity, urban-rural, Malaysia, quantile regression

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INTRODUCTION

Malaysia consists of 13 states (11 in Peninsular Malaysia, and two on the Borneo Island across the South China Sea) and three Federal Territories. The Northern region comprises Perlis, Kedah, Penang, and Perak, the Central region includes Selangor and the Federal Territories of Kuala Lumpur and Putrajaya, the Southern region comprises Negeri Sembilan, Malacca, and Johore, the Eastern region comprises Pahang, Terengganu, and Kelantan, while East Malaysia comprises Sabah, Sarawak and the Federal Territory of Labuan.

Since independence in 1957, rapid socio-economic development has transformed Malaysia from a low-income rural agricultural society to an increasing reliance on the manufacturing and services sectors, with three-quarters of its population living in the urban areas. The economy was growing at around 8% per annum for more than three decades before the Asian Financial Crisis in 1997. Apart from the recessions in 2001 and 2008 due to the global financial crisis, the Malaysian economy has been growing at between 4.5% and 6% per annum since 2002.

The GDP per capita rose from Ringgit Malaysia (RM) 20,870 (US$6,480) in 2005 to RM38,853 (US$9,721) in 2016 (DOSM, 2017c). Malaysia is an upper middle-income high Human Development Index (HDI) country (ranked 59th in the world). Between 1970 and 2014, development efforts had eradicated absolute poverty and reduced general poverty from 49.3% in 1970 to just 0.4% in 2016. The Gini coefficient has come down from 0.513 in 1970 to 0.401 in 2014 (Economic Planning Unit, 2015).

The Malaysian economic policies pursued since the 1970s have been underpinned by the development philosophy of growth with distribution, focussing on poverty eradication to reduce economic imbalances between ethnic groups and across regions. While the development programmes have succeeded in reducing the incidence of poverty, wide economic disparities persist to this day. In pursuing a more balanced regional development, the government has created five development corridors in the northern, southern and eastern regions in Peninsular Malaysia, as well as Sabah and Sarawak during the 9th Malaysia Plan period (2006-2010). However, these efforts at redirecting employment opportunities have so far not resulted in significant population redistribution. The population continues to grow much more rapidly in the central region than in the regions with the development corridors. There are still wide variations in income across states. In 2016, the median and mean monthly household income ranged from RM3,037 and RM4,214 in Kelantan to RM9,073 and RM11,692 in Kuala Lumpur respectively (DOSM, 2017a).

There is a rather sizeable literature on income distribution and inequality in Malaysia (Jomo, 2004; Khalid, 2011; Milanovic, 2006; Ragayah, 1999, 2008, 2009; Saari, Dietzenbacher, & Los, 2014; Shari & Ragayah, 1990; Shireen, 1998). Most of these earlier studies had focussed on ethnic differentials in

income, as it was the main objective of the New Economic Policy (1970-1990) to reduce economic disparities between the ethnic groups. A few recent studies have explored regional income inequalities (Abdullah, Doucouliagos, & Manning, 2015; Ali & Ahmad, 2009; Habibullah, Dayang-Afizzah, & Puah, 2012; Habibullah, Smith, & Dayang-Afizzah, 2008; Hooi, Nguyen, & Jen, 2011). A significant finding by Abdullah (2012) based on meta-regression analysis and panel data econometrics, is that regional income inequality has a positive effect on growth; and that while income inequality has declined in general, there is a tendency to increasing inequality between Malaysian states.

Past studies on income distribution and poverty in Malaysia have consistently found significant ethnic and urban-rural differentials in income, even after adjusting for other socioeconomic variables (Ismail & Jajri, 2012; Khalid, 2011; Ragayah, 2008; Rodríguez-Pose & Tselios, 2009; Saari, Dietzenbacher, & Los, 2014). However, to our knowledge, no research has been done on the moderating effects of these two variables on state differentials in income in Malaysia. Hence, this article seeks to analyse income inequality across states, taking into account the ethnic and urban-rural distribution. Because income data are not normally distributed, and the income differentials across states may not be the same at different income level, quantile regression was used in this analysis instead of the ordinary least square (OLS) method used in previous local and international studies (Estudillo, Sawada, & Otsuka, 2008; Ismail & Jajri, 2012; Ismail & Noor, 2005; Kajisa & Palanichamy, 2006; Milanovic, 2006; Onyebinama & Onyejelem, 2010; Ragayah, 2008; Schafgans, 2000).

An analysis of the income differentials across states at different income level, and the relevant factors affecting income differentials are needed to provide some inputs to inform policy on reducing regional income disparity. This article also aims to contribute to the literature on relative poverty and income distribution in developing countries.

METHODOLOGY

Data

Data for this article came from the Household Income and Basic Amenities Survey conducted by the Department of Statistics, Malaysia (DOSM) in 2014. The sampling frame for the selection of sample for this survey used the updated Household Sampling Frame, making up of urban and rural Enumeration Blocks (EBs) created for the 2010 Population and Housing Census. The two-stage stratified sampling design was adopted to select 10,432 EBs in the first phase, and then systematic sampling was used to select 81,632 living quarters, covering 81,137 households to produce a representative sample of all the households in the country. The Department of Statistics Malaysia provided raw data for a sub-sample of 24,463 households for this analysis. At the time of the writing of this

report, the Department of Statistics Malaysia has not released the sample data for the latest round of survey conducted in 2016.

The survey collected information on household income for twelve months. The sources of income comprise paid employment, self-employment, property, and investment income and current transfers received, received by all members of households, both in cash and in kinds which repeatedly occur within a year. The mean monthly gross household income for the sample in this study was RM6,141, with relative standard error (RSE) of 0.4% or a standard error of RM25.

Methods

The dependent variable for this study is monthly income per capita (monthly income divided by household size). The income per capita was found to be not normally distributed, and hence the regression analysis used the logarithm term of income. The urbanisation level and ethnic distribution vary across the states. The regression analysis included urban-rural and ethnic distributions as these two variables are closely associated with income. Other relevant variables such as migration, education, urbanisation, and employment structure were not included in the regression model, as these variables refer to the characteristics of the individuals, while the dependent variable is at the household level. Instead, this paper examines the median household income for each state by selected socio-demographic and economic conditions.

The differentials in monthly income per capita across states, taking into account the level of urbanisation and ethnic distribution, were estimated using quantile regression. As compared to OLS that merely estimates the conditional mean of income, quantile regression has the advantage of allowing the estimation of the parameter differentials across quantiles of the income distribution. The quantile regression model, adapted from Koenker and Basset (1978), is shown as follows:

$$y_i = x_i\beta + \varepsilon_i \tag{1}$$

where y_i is monthly income per capita for household i, i = 1, 2, …, n, x_i is the vector of independent variables, β is the parameter, and ε_i is the disturbance term. The estimators for a quantile θ, $0<\theta<1$, is obtained by minimizing the objective function F over β_θ, as shown below:

$$F(\beta_\theta) = \sum_{i\epsilon\{i:y_i\geq x_i'\beta_\theta\}}^{N} \theta\left|y_i - x_i'\beta_\theta\right| + \sum_{i\epsilon\{i:y_i<x_i'\beta_\theta\}}^{N} (1-\theta)\left|y_i - x_i'\beta_\theta\right| \tag{2}$$

Data were analysed using Eviews 9, based on the QREG method. The standard errors of the estimators were estimated through bootstrapping, with 100 replications. The inverse variance-weighted average method was used to

overcome under- or over-representation of each state, based on the "weight" variable constructed for the 2014 Household Income and Amenities Survey.

RESULTS

Income Differentials across States

In 2014, the national mean and median monthly income per capita was estimated at RM1,706 and RM1,197 respectively. Figure 1 and Table 1 show that income per capita is not normally distributed and highly skewed to the right. Transforming the income data into the logarithm term reduces the skewness substantially, but the extreme values are still present in both tails. Hence, quantile regression is more appropriate than OLS regression for analysing the income differentials.

The skewness, kurtosis and the vast difference between the mean and median values indicate the skewed distribution of the income data, and the large standard deviation shows the wide dispersion of the data (Table 1). The Breusch-Pagan-Godfrey test for constant variance (test statistic = 1742.35, p-value = 0.0000) indicates the presence of the problem of heteroscedasticity, and this further justifies the use of quantile regression.

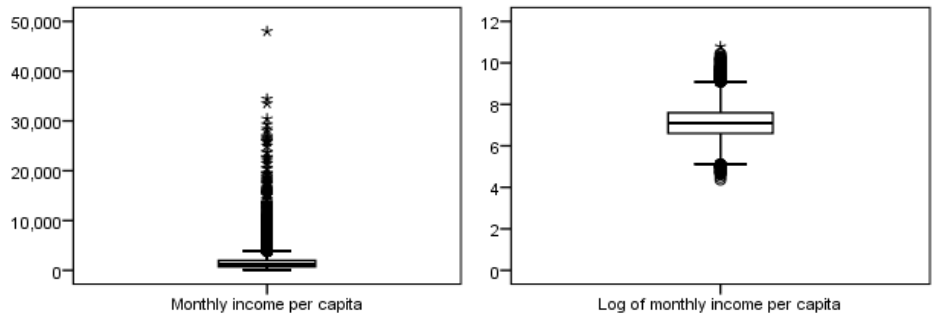

Figure 1 Box plot

Table 1 Summary statistics for monthly income per capita

	Monthly income per capita	**Log of monthly income per capita**
Mean	1705.8	7.12
Median	1197.0	7.09
Maximum	48007.6	10.78
Minimum	78.3	4.36
Std. Dev.	1863.1	0.77
Skewness	5.7	0.29
Kurtosis	62.0	0.33

The monthly income per capita varied widely across states, as shown in Table 2. The mean income per capita in Kuala Lumpur and Putrajaya was 3.3-3.5 times that of Kelantan, the least developed state. Neighbouring state Selangor was not too far behind. The three states in the southern regions fared better than those in the northern region (except Penang), and the eastern region as well as East Malaysia (except Federal Territory Labuan). Apart from Penang in the north and Labuan in East Malaysia, the income variations across the states in the northern, eastern and East Malaysia (Sabah and Sarawak) are relatively small.

The income per capita in the urban areas was about 1.8 times higher than that in the rural areas. Despite the various programmes to reduce the ethnic disparity in income, income per capita of the non-Bumiputera (comprising mainly the Chinese and Indians) remained much higher than that of the majority Bumiputera (comprising the Malays and other indigenous populations), at 1.5:1.

Table 2 Mean, median and standard deviation of income per capita by state

Variable	n	%	Monthly income per capita (RM)			
			Mean	Median	Std. Dev.	Gini coefficient
Total	24,463	100.00	1705.78	1197.00	1863.05	0.397
States						
Johore	2,196	8.98	1613.14	1262.13	1421.91	0.329
Kelantan	1,523	6.23	936.55	662.50	945.10	0.386
Kedah	1,579	6.45	1235.04	871.56	1104.98	0.359
Malacca	783	3.20	1594.15	1252.68	1335.29	0.303
N. Sembilan	935	3.82	1600.07	1210.53	1536.39	0.354
Pahang	1,264	5.17	1173.86	899.90	965.86	0.343
Penang	1,481	6.05	1716.56	1293.78	1607.48	0.357
Perak	1,873	7.66	1297.24	988.08	1184.95	0.363
Perlis	485	1.98	1203.51	900.18	944.48	0.328
Selangor	2,729	11.16	2229.31	1636.00	2087.73	0.379
Terengganu	1,154	4.72	1136.04	861.67	892.49	0.341
Sabah	2,835	11.59	1337.33	888.39	1593.43	0.383
Sarawak	3,659	14.96	1414.15	997.42	1473.24	0.388
Kuala Lumpur	1,599	6.54	3300.92	2185.08	3663.80	0.399
Labuan	212	0.87	2039.47	1334.65	2640.32	0.423
Putrajaya	156	0.64	3008.49	2179.13	2176.95	0.369
Strata						
Rural	7,546	30.85	1034.54	769.86	980.63	0.348
Urban	16,917	69.15	1907.05	1372.54	2011.91	0.386
Ethnicity						
Bumiputera	17,021	69.58	1450.44	1044.67	1441.34	0.384
Non-Bumiputera	7,442	30.42	2186.60	1531.67	2396.05	0.402

The overall Gini coefficient stood at 0.397. The Gini coefficients are generally higher in the more urbanized states, and also among the non-Bumiputera as compared to the Bumiputera.

Table 3 The estimated weighted least square (WLS) and quantile regression

	WLS	q10	q25	q50	q75	q90
States						
Kelantan (ref.)						
Johore	0.4387***	0.5440***	0.5606***	0.4656***	0.3182***	0.2430***
Kedah	0.1835***	0.1929***	0.2400***	0.1874***	0.1676***	0.1137**
Malacca	0.3899***	0.4828***	0.5294***	0.3987***	0.3228***	0.2111***
Negeri Sembilan	0.4131***	0.4362***	0.5064***	0.4311***	0.3669***	0.2417***
Pahang	0.2064***	0.2530***	0.3012***	0.2233***	0.1277**	0.0637
Penang	0.3735***	0.4997***	0.5117***	0.3899***	0.2923***	0.2021***
Perak	0.1685***	0.2035***	0.2328***	0.1819***	0.1458***	0.0659
Perlis	0.2529***	0.3267***	0.3711***	0.2660***	0.2323**	0.1668
Selangor	0.6340***	0.6046***	0.6509***	0.6485***	0.6160***	0.6370***
Terengganu	0.1937***	0.2081***	0.2509***	0.2455***	0.1800***	0.0604
Sabah	0.1966***	0.0617	0.1547***	0.2116***	0.2469***	0.2881***
Sarawak	0.3087***	0.2746***	0.3277***	0.3010***	0.2998***	0.2863***
Kuala Lumpur	0.9146***	0.8383***	0.9232***	0.9065***	0.8996***	0.9995***
Labuan	0.5128***	0.4144***	0.5348***	0.5286***	0.5697***	0.5845***
Putrajaya	1.0809***	1.2740***	1.1706***	1.0139***	1.0386***	1.0500***
Strata						
Rural (ref.)						
Urban	0.3347***	0.3139***	0.3210***	0.3347***	0.3484***	0.3396***
Ethnicity						
Bumiputera (ref.)						
Non-Bumiputera	0.2274***	0.2224***	0.2146***	0.2302***	0.2171***	0.2455***
Constant	6.3872***	5.5642***	5.8801***	6.3331***	6.8360***	7.3279***
Pseudo R^2	-	0.1322	0.1264	0.1172	0.1046	0.1068
Adj. R^2	0.2082	0.1316	0.1258	0.1166	0.1040	0.1061

Notes:
(a) Dependent variable is log of monthly income per capita.
*(b) *** p<0.001, ** p<0.01, * p<0.05.*
(c) WLS was used instead of OLS to take into account the effect of the "weight" variable.

Results from the weighted least square (WLS) show that after adjusting for urbanisation and ethnic composition, the monthly income per capita was highest in Kuala Lumpur and Putrajaya (about twice that of Kelantan), followed by Selangor and Labuan (63% and 51% higher than Kelantan respectively). The three states in the southern region – Johore, Negeri Sembilan, and Malacca had an income level of about 40% higher than Kelantan (Table 3).

Table 3 shows the coefficients for the quantile regressions. The impacts of each of the three predictors (state, urban-rural location, and ethnicity) in income per capita are not the same at different quantiles, especially across the states. Generally, state-level income differentials tended to be more pronounced

at the lower income levels (q10 and q25), as compared to higher income levels, except Sabah and Labuan where the income differentials with other states were less pronounced at q10 and q25 than at upper quantiles. Except for Kuala Lumpur, Labuan, Sabah, and Putrajaya, q25 provides the most significant income differentials across the states in Malaysia.

There are significant income differentials between the different ethnic groups (Table 3). The non-Bumiputera had a higher income than the Bumiputera in all quantiles, and the differential was most notable at q90. The urban-rural income disparity was even more pronounced. Households in urban areas had a much higher income than those in the rural areas in all the quantiles, and the most significant differential was at q75.

Explaining the Income Differentials across States

Several factors such as urbanisation, ethnic distribution, education level, internal migration, employment structure, female labour force participation, and household size may affect the income differentials across the states. Some of these variables are closely associated with one another. For instance, the propensity to migrate among the higher educated is much higher than those who have fewer years of schooling, and the Bumiputera are much more likely than the non-Bumiputera to reside in the rural areas. The following sections examine the association between the median income per capita and these variables by states, as shown in Table 4.

Urbanisation

The urbanisation level varies from 47% in Kelantan to over 93% in Penang and Selangor and 100% in Kuala Lumpur and Putrajaya. The median income per capita is higher in the more urbanized states (Table 4). The 2017 Salaries and Wages Survey Report shows that the average earning of a worker in the rural areas, at RM2,040 (median RM1,400), was much lower than that of their urban counterparts at RM3,038 (median RM2,260) (DOSM, 2018). The large income differentials between urban and rural areas were in turn due to other factors such as higher educational level, the availability of higher paid jobs as well as higher female labour force participation rate in the urban areas. There are two conflicting policies concerning migration in the 11th Malaysia Plan. While propelling sectoral migration towards high-value-added and knowledge-intensive activities in the cities, the Government has also taken initiatives to enable the mobilisation of rural youths in entrepreneurship activities to minimise migration to urban areas (Economic Planning Unit, 2015).

Education

The educational level of workers varies widely by states. Tabulation of the 2% sample data from the 2010 Population Census shows that the proportion of population aged 20-60 years who had a post-secondary education was lowest in Sabah and Sarawak (at around 16%-17%) and highest in Putrajaya (63%), followed by Kuala Lumpur (45%) (Table 4). The income per capita is strongly associated with the proportion of prime working age population with post-secondary education. Higher education has a substantial premium in the remuneration of the workers. The 2017 Wages and Salary survey showed that the mean earned income ranged from RM1,649 among those with primary education to RM2,055 among those with secondary education and RM4,300 among those with tertiary education (DOSM, 2018).

Internal Migration

Migration tends to be selective of the high-skill workers. Being the administrative, commercial, business, the industrial and educational hub of the country, the central region comprising Kuala Lumpur, Putrajaya and Selangor has been the main destination of migrants from all over the country. Data from the 2010 Population Census show that more than 60% of the working population aged 20 to 60 years in Kuala Lumpur and Selangor were born outside the state (Table 4). In comparison, only 9% of the people in Kelantan and 14% in Sarawak were born outside the state. The economic opportunities in the more developed states have acted as a pull factor for migrants in the receiving states, and the inflows of highly educated and trained migrants have contributed to the higher income level of the receiving states. On the other hand, the sending states are further disadvantaged by the outflow of the more resourceful segments of the population, thus exacerbating the regional income inequality. Table 4 depicts the close association between internal migration and income level.

Occupation

The managers/administrators and the professionals are among the highest paid workers, with a mean salary of RM7,847 (median RM5,800) and RM5,084 (median RM4,467) respectively, as compared to the national average of RM2,880 (median RM2,160) as of 2017 (DOSM, 2018). Hence, the higher income level in Kuala Lumpur, Putrajaya and Selangor can be explained by the much higher proportion of managers/administrators and professionals, as shown in Table 4.

Table 4 Median monthly income per capita and selected socio-demographic and economic variables by state

	Median monthly income per capita (RM)	**% Urban**	**% with post-secondary education (aged20-60)**	**% born out of state (aged 20-60)**	**% managerial or professional (age 20-60)**	**Female labour force participation rate (%)**
States						
Kelantan	662.50	46.90	20.17	9.00	10.96	48.80
Johore	1262.13	75.60	27.94	26.49	9.34	50.80
Kedah	871.56	68.00	18.46	21.55	11.64	50.70
Malacca	1252.68	91.90	28.38	33.17	14.48	55.40
Negeri Sembilan	1210.53	72.00	23.60	39.42	13.38	50.00
Pahang	899.90	55.20	23.52	38.45	9.87	50.30
Penang	1293.78	93.90	22.72	31.50	14.78	60.60
Perak	988.08	74.50	20.94	18.58	14.15	44.40
Perlis	900.18	59.90	20.32	28.21	14.39	44.10
Selangor	1636.00	93.00	35.02	63.96	22.41	60.30
Terengganu	861.67	63.50	21.47	16.02	13.30	44.30
Sabah	888.39	57.90	16.22	28.61	9.33	53.00
Sarawak	997.42	57.10	16.53	14.13	10.26	54.70
Kuala Lumpur	2185.08	100.00	45.02	61.48	23.88	59.30
Labuan	1334.65	85.10	18.58	67.18	13.35	48.80
Putrajaya	2179.13	100.00	62.97	100.00	26.93	80.90
Spearman correlation coefficient[#]		0.873	0.665	0.765	0.668	0.653

Notes:
(a) Data sources: DOSM (2011, 2017b).
(b) # Refer to the Spearman rank correlation coefficient between the median monthly income per capita with each of the socio-demographic and economic variables.

Female Labour Force Participation

With rising education and cost of living, more and more women are working to pursue their career and to contribute to the family's finance. The female labour force participation rate had risen from 46.4% in 2009 to about 54.1% in 2016 (DOSM, 2017b). In the 11th Malaysia Plan, the Government has taken several measures to create job opportunities for women to increase the female labour force participation rate to 59% by 2020 (Economic Planning Unit, 2015). The higher female labour force participation rate in Putrajaya, Kuala Lumpur and Selangor has contributed to the higher income per capita in these states/regions (Table 4). On the other hand, the relatively larger family size in the less developed states has resulted in lower income per capita. In 2016, the total fertility rate ranged from 1.5 in the Federal Territory Kuala Lumpur to 3.2 in Kelantan and Terengganu (DOSM, 2017a).

DISCUSSION

This analysis shows that the wide income differentials across states and regions are attenuated after taking into account the urbanisation level and ethnic composition of the states. Both the urbanisation and ethnic variables are closely related to the employment structure and income. Jobs in the services and manufacturing sectors in the urban labour market tend to command a higher pay due to the higher skill required. Perrela-Tallo (2017) argued that the growing income inequality is due to biased technological change, as it increases the income share of the wealthy households at a faster rate than the poorer households. The urban services sector, the driver of Malaysia's economic growth, has been transforming rapidly toward more capital intensive and knowledge-based activities that yield a higher premium. In terms of ethnicity, the non-Bumiputera, in particular, the Chinese community has dominated the businesses in Malaysia. Hence, states with a higher concentration of Chinese tend to have a more developed business sector, which generates more wealth.

Malaysia's substantial investment in education and skills training and the creation of high paying jobs have been the key factors behind the rapid economic growth and social development. With the provision of free education up to the upper secondary level, and the liberalization of the education policy since the late 1990s, tertiary enrolment ratio has exceeded 40%, and females have overtaken the males in higher education (World Bank, 2018). The higher educated youths tend to seek jobs in the capital cities in the central region, depleting the human resources in the sending areas. While increased female labour force participation rate will result in raising the household and national income, such an increase is likely to concentrate in the big cities where there is a higher demand for skilled workers. All these trends will exacerbate regional inequality.

With the eradication of absolute poverty, the focus is now on raising the income level of the bottom 40% of the income categories. Since 2012, the government has been providing annual cash assistance to the poor. In the 2019 Budget, the government provided a yearly cost of living assistance (BSH) of RM1,000 to households with a monthly income of RM2,000 and below, RM700 to households with monthly income from RM2,001 to RM3,000, and RM500 to households with monthly income from RM3,001 to RM4,000. Hakim (2000) found that a large portion of the total inequality in Malaysia was attributable to labour income. The adoption of a minimum wage of RM1,100 in 2019 would reduce the income gap between the rich and the poor. Efforts such as the development corridors have also been made to create jobs in the less developed states/regions.

As regional inequality remains an important policy issue, there is a need for an assessment of the effectiveness of the various policies and programmes in narrowing the regional income disparity for appropriate intervention strategies to be undertaken. This analysis has explored some plausible reasons for the

persistence of income inequality across the states. More detailed studies are needed to find out the underlying causes, and more effective programmes need to be formulated and implemented. The effectiveness of the development corridors in population and labour redistribution remains to be seen. While Malaysia takes pride in the full employment situation, there is a concern about the continued influx of migrant workers, who make up about one-fifth of the workforce. There is a need to provide the necessary support and assistance to enable more women and men to have a work-life balance while pursuing their career to increase the household income. Policymakers and employers may consider a more flexible employment structure and greater use of technology.

In conclusion, income inequality across states remains wide despite various efforts to bring about a more balanced regional growth and development. This analysis has shown that state-level differentials in ethnic and urban-rural population distribution, educational level, migration pattern, and employment structure are closely associated with income per capita. More detailed analysis is needed to assess the impact of individual characteristics on their earning, as data become available.

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