PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 20 ISSUE 3 (2022), Page 227 – 238

POPULATION REDISTRIBUTION AND CONCENTRATION IN MALAYSIA, 1970-2020

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Abstract

This paper uses published census data to examine population redistribution and concentration in Malaysia since 1970. The population growth rate varied widely across states and districts, and between urban and rural areas. Consequently, the population has become ever more concentrated in the cities. In 2020, 41% of the population lived in 12 districts, making up 2.6% of the total land area. About one in four Malaysians live in the Greater Kuala Lumpur (commonly known as the Klang Valley – comprising the Federal Territory Kuala Lumpur and four adjacent districts in Selangor), compared to 4.3% in 1970. The population in urban areas increased from 28% in 1970 to 75% in 2020, and most are in the cities. The rapid growth of urban population and concentration of population in major cities pose sustainable development challenges. However, the agglomeration of diverse labour pools provides economies of scale.

***Keywords**:* Redistribution, Concentration, Population growth, Urbanisation, Population Density, Conurbation

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INTRODUCTION

Migration, population redistribution and development are closely interrelated. Uneven population growth and distribution are the results and causes of regional and urban-rural disparities in development (Bertinelli & Strobl, 2007; Fan, 2005; Frick & Rodríguez-Pose, 2018; Rees et al., 2017; Sato & Yamamoto, 2005; Tey et al., 2019). Net migration is the primary determinant of contemporary population redistribution and concentration (Borgegård et al., 1995; Fan, 2005; Gibson & Gurmu, 2012; Newbold, 1999; Rees et al., 2017; Zhou et al., 2021). According to classical economic and geographical theories, population concentration results from the advantages of densely populated regions, where accessibility to human resources reduces transportation costs and enhances the economies of scale (Borgegård et al., 1995; Morrill, 1979; Zhou et al., 2021). The development of new energy sources, technology, and large-scale economic activities have a concentrating effect on population redistribution (Bertinelli & Black, 2004; Borgegård et al., 1995; Sato & Yamamoto, 2005). Migration from less developed to more developed regions has exacerbated regional disparity in socio-economic development (Bertinelli & Strobl, 2007; Frick & Rodríguez-Pose, 2018; Johnson et al., 2012; Salvia et al., 2020). There are mixed findings on the effectiveness of population redistribution policies and programs in influencing population mobility and human settlement patterns (De Koninck & Déry, 1997; Salvia et al., 2020).

In Malaysia, population redistribution and rapid urbanisation occurred concurrently with fundamental economic changes. In 1970, about half of the workers were engaged in agriculture, but this declined to 10% in 2021. There was a corresponding increase in the manufacturing and sales/services/construction sectors from 8.2% and 44% to 17% and 73%, respectively (DOSM, 2022b). Concurrently, wide variations in the rate of population growth across states resulting from unequal regional development have given rise to population redistribution from the less developed states/regions to the more developed states/regions (DOSM, 2011a, 2011b, 2022a). While the urban population has grown exponentially, the rural population has stagnated. As a result, the urbanisation level rose from 28% in 1970 to 75% in 2020. Moreover, three-quarters of the migrants had moved from one urban centre to another. Most of these were from smaller towns to the metropolis, with Klang Valley (Kuala Lumpur and four adjacent districts in Selangor) as the primary destination (DOSM, 2021, 2022a).

Population redistribution and urbanisation have become increasingly important policy issues in Malaysia. Accordingly, the Government launched the development corridors under the Ninth Malaysia Plan (2006-2010) to reduce disparities between rural and urban areas and between less developed and more developed regions. The five development corridors comprised: i) East Coast Economic Region (ECER); ii) Northern Corridor Economic Region (NCER); iii)

Iskandar Malaysia (IM) in the South, iv) Sabah Development Corridor (SDC); and v) Sarawak Corridor of Renewable Energy (SCORE), to create 1.9 million, 3.1 million, 1.4 million, 2.1 million and 3 million jobs respectively (Economic Planning Unit, 2006). Currently, the Twelve Malaysia Plan (2021-2025) envisages that by 2040, about 85% of the population will reside in urban areas. Hence, the New Urban Agenda under the Plan aims to foster a sustainable urban economy through green and resilient urban development (Economic Planning Unit, 2021).

Despite the importance of population distribution in development planning, there are few studies on migration and population distribution in Malaysia (Chitose, 2001, 2003; Hussain et al., 2014; Jali, 2009; Samat et al., 2019; Tey, 2014). This paper seeks to elucidate the redistribution and concentration of population in Malaysia to stimulate more research on the causes and consequences of these relatively neglected demographic processes and outcomes to inform policy.

DATA AND METHODS

Data for this paper are drawn from the published reports of the decennial population censuses for the period 1970-2020. In addition, this paper uses data on urban agglomeration from the World Urbanization Prospects: 2018 Revision (United Nations, 2018). In this paper, urban population refers to gazetted areas with a population of 10,000 or more in the core areas and the adjoining built-up areas (DOSM, 2011b, 2022a).

The paper uses simple statistical analysis by cross-classifying population distribution, growth rate, density and concentration, and urbanisation by state and district over the different periods. The average annual rate of the population is computed based on the exponential growth rate. The population concentration index was constructed using Hoover's method.

RESULTS

Population growth and distribution

The population of Malaysia has grown from 10.44 million in 1970 to 32.4 million in 2020, at an average rate of 2.3% per annum. The rate of population growth decelerated to 1.7% between 2010 and 2020. The population living in urban areas has increased from 28.4% to 75.1%. However, the population growth rate has been uneven across states and regions, resulting in dramatic population redistribution and concentration.

In 1970, Perak was the most populous state. However, its proportionate share of the total population has declined steadily from 15% to 7.7% in 2020. In contrast, Selangor's population increased phenomenally by more than seven-fold, from 982 thousand to about 7 million. This extraordinary increase boosted Selangor's share of the total population from 9.4% in 1970 to 13.1% in 1991 and

21.6% in 2020. Sabah's population grew more than five-fold from about 600 thousand to 3.4 million. Sabah became the fourth most populous state in 1991 (9.9%) and the third most populous after Selangor and Johor since 2000. Johor and Pahang maintained their share of the national population at about 12.4% and 4.9%, respectively, over the past five decades. All other states registered a significant decline in the relative share of the national population.

Between 1970 and 2020, the proportion of the population in the central region (Kuala Lumpur and Selangor) rose from 15.7% to 28%, while that in the Sabah and Sarawak region rose from 15.6% to 18.4% (a decline from 19.5% in 1991). The northern region (Perlis, Kedah, Pulau Pinang, and Perak) registered the sharpest decline from 32.7% to 20.5%, followed by the southern region (Johor, Melaka and Negeri Sembilan) from 20.7% to 19%, and the eastern region (Kelantan, Terengganu, and Pahang) from 15.3% to 14%.

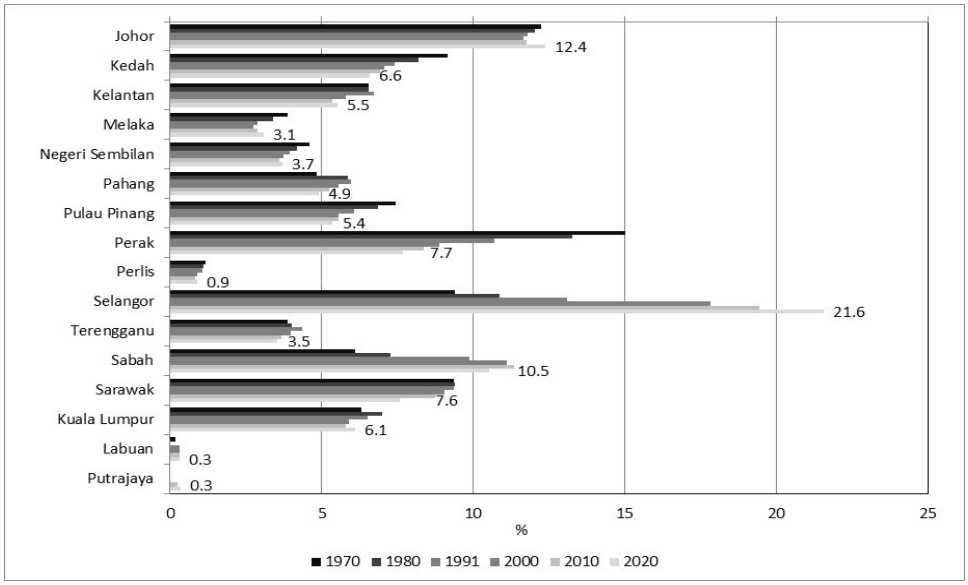

Figure 1: Population distribution by state, 1970-2020
Source: DOSM (various years)

Population concentration

The population is heavily concentrated in a few densely populated districts and metropolitan areas. The combined population of the 12 most populous districts increased from 6.0 million in 1991 to 13.3 million in 2020. These figures translate to 34% and 41.1% of the national population, while the land area in these districts made up only 2.6% of the total land area. Five of the six most populous districts in 2020 are in the Klang Valley, making up about 23% of the national population (Table 1). On the other hand, the 25 least populous districts had a combined

population of 500,543 or 1.54% of the national population in 2020. Most of the least populous districts are in Sarawak. In Peninsular Malaysia, eight districts had a population of less than 60,000 each (table not shown).

Table 1: Population of the twelve most populous districts in 2020 (changes since 1991), the annual rate of growth, and population density

District	1991	2000	2010	2020	Annual rate of growth	Land area	Population density (2020)
Petaling	633,165 (3.6)	1,184,180 (5.3)	1,765,495 (6.4)	2,298,123 (7.1)	4.4	487 (0.15)	4,719
Kuala Lumpur	1,145,342 (6.5)	1,305,792 (5.9)	1,588,750 (5.8)	1,982,112 (6.1)	1.9	243 (0.07)	8,157
Johor Bahru	704,471 (4.0)	1,081,978 (4.5)	1,334,188 (4.9)	1,711,191 (5.3)	3.1	1,066 (0.32)	1,605
Ulu Langat	413,900 (2.4)	864,451 (3.9)	1,138,198 (4.1)	1,400,461 (4.3)	4.2	833 (0.26)	1,681
Klang	406,994 (2.3)	643,436 (2.9)	842,146 (3.1)	1,088,942 (3.4)	3.4	632 (0.19)	1,723
Gombak	352,649 (2.0)	537,525 (2.4)	668,694 (2.4)	942,336 (2.9)	3.4	653 (0.20)	1,443
Kinta	627,899 (3.6)	703,493 (3.2)	749,474 (2.7)	888,767 (2.7)	1.2	1,305 (0.40)	681
Seremban	263,383 (1.5)	383,530 (1.7)	536,147 (2.0)	692,407 (2.1)	3.3	954 (0.29)	726
Kuching	369,200 (2.1)	494,109 (2.2)	598,617 (2.2)	609,205 (1.9)	1.7	1,498 (0.45)	407
Melaka Tengah	296,897 (1.7)	371,263 (1.7)	484,885 (1.8)	597,135 (1.8)	2.4	359 (0.11)	1,663
Timur Laut	395,714 (2.3)	416,369 (1.9)	510,996 (1.9)	556,557 (1.7)	1.2	126 (0.04)	4,417
Kota Bharu	366,770 (2.1)	398,835 (1.8)	468,438 (1.7)	555,757 (1.7)	1.4	403 (0.12)	1,379
Total	5,976,384 (34.0)	8,384,961 (37.8)	10,686,028 (38.9)	13,322,993 (41.1)	2.8	8,559 (2.60)	1,557
Malaysia	17,563,420	22,198,276	27,484,596	32,447,385	2.1	329,847	98

Note: Figures in parentheses denote the percentage share of the district population and land area to the total.
Source: DOSM (various years)

The Hoover index of population concentration compares the distribution of the population of the region, state, and district with the relative size of the land area (Rogerson & Plane, 2013). The statistics show a rise in population concentration across all levels. The concentration index at the regional level rose from 42.8 in 1991 to 47 in 2020 as more and more people moved to the central region. The concentration index rose from 45.7 to 48.2 at the state level

for the country as a whole. At the district level, the concentration index rose from 50.9 in 1991 to 57.4 in 2020 (Table 2).

Table 2: Population concentration index

	Concentration index, I_C $I_C = 0.5\sum_{i=1}^{n}\lvert x_i - y_i \rvert$	
	1991	**2020**
Regional level (Malaysia)	42.8	47.0
State level (Malaysia)	45.7	48.2
State level (Peninsular Malaysia)	30.0	38.3
District level (Peninsular Malaysia)	50.9	57.4

Notes:
x is the percentage of the population in each area
y is the percentage of the total land in each area
i is a data category, such as a region or area
n is the number of categories

Source: DOSM (various years)

In 2020, the concentration index by district was highest in Kelantan (63.2) and lowest in Pulau Pinang (21.7) (Table 3). The high concentration index in Kelantan can be explained by the concentration of the population in Kota Bharu (31% of the state population). In contrast, its land area constitutes only 2.7% of the land area in the state. On the other hand, in Pulau Pinang, the disparity in the population and land area is less pronounced – 32% of the population resides in Timur Laut, which constitutes 12% of the land area in the state.

In Negeri Sembilan, 57.7% of the population resided in Seremban, the most populous district, where the state capital is located. In contrast, only 14.6% of the population in Sabah resided in the state capital, Kota Kinabalu, which is the most populous district (Table 3). In interpreting these figures, there is a need to consider the number of districts in each state. The number of districts ranges from 3 in Melaka (besides Perlis, which has only one district) to 27 in Sabah and 40 in Sarawak.

Table 3: Population concentration index at the state level by district, 2020

State	**Concentration index**	**The most populous district in the state**	**District share (%)**
Johor	44.4	Johor Bahru	42.7
Kedah	38.6	Kuala Muda	25.6
Kelantan	63.2	Kota Bharu	31.0
Melaka	40.8	Melaka Tengah	40.8
Negeri Sembilan	46.0	Seremban	57.7
Pahang	35.0	Kuantan	34.4
Pulau Pinang	21.7	Timur Laut	32.0

Perak	41.1	Kinta	35.6
Selangor	49.5	Petaling	32.9
Terengganu	36.9	Kuala Terengganu	20.0
Sabah	45.5	Kota Kinabalu	14.6
Sarawak	60.2	Kuching	24.8

Source: DOSM (various years)

Urbanisation and urban agglomeration

Malaysia has been urbanising rapidly, from 28.4% in 1970 to 51% in 1991 and 75.1% in 2020. The urbanisation level and pace varied widely across states. In 1970, only two states had an urbanisation level of above 50%, but this increased to eight in 2000 and all except Kelantan in 2020. More than 90% of the population in Selangor, Pulau Pinang, and Melaka live in urban areas, while Kuala Lumpur and Putrajaya are fully urbanised (Figure 2).

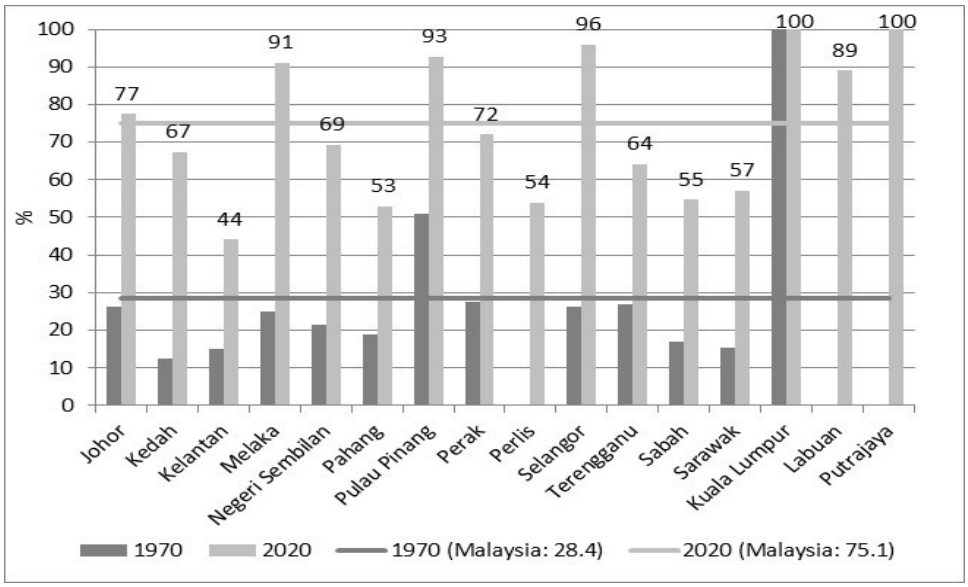

Figure 2: Urbanisation level by state, 1970 and 2020
Source: DOSM (various years)

The population tends to concentrate on large metropolitan areas within the urban system. For example, in 1970, Kuala Lumpur was the only conurbation with more than 300,000 inhabitants. This number increased to five by 2000, and further to twelve in 2020, with a population of 14.2 million. About 44% of the total population, and 58% of the urban population, reside in these metropolitan areas.

With its satellite cities Petaling Jaya, Gombak, Ampang, Subang Jaya, and Shah Alam, Kuala Lumpur is the largest conurbation, making up 56% of

these conurbations, or 33% of all urban population. Greater Kuala Lumpur is also the fastest-growing metropolitan, increasing by 18-fold between 1970 and 2020. The primacy index (population of the largest city/population of the second-largest city) had increased from 1.8 in 1970 to 7.8 in 2020. Kota Kinabalu conurbation, starting with a small population base, expanded 14-fold. In contrast, Georgetown, Ipoh, and Kuching registered only a three-fold increase in population over the same period (Table 4).

Table 4: Population of conurbations (city centre and satellite towns) with 300,000 inhabitants or more in 2020, 1970-2020

	1970	**1980**	**1990**	**2000**	**2010**	**2020**	**Annual rate of growth**	**Increment (times)**
Alor Star	66	72	151	186	254	342	3.3	5.2
Georgetown	272	314	518	575	708	794	2.0	2.7
Ipoh	247	295	447	537	664	814	2.4	3.3
Johor Bahru	136	247	417	630	807	1,024	4.0	7.5
Kota Bharu	90	171	227	252	297	348	2.7	3.9
Kota Kinabalu	41	109	154	307	413	550	5.2	13.5
Kuala Lumpur	451	971	2,098	4,176	5,810	7,997	5.7	17.7
Kuala Terengganu	99	181	223	255	315	384	2.7	3.9
Kuantan	90	132	194	289	383	503	3.4	5.6
Kuching	193	229	273	422	510	612	2.3	3.2
Sandakan	81	111	151	277	323	375	3.1	4.6
Seremban	95	133	186	291	373	475	3.2	5.0

Note: Georgetown was not listed in the World Urbanization Prospects: 2018 Revision.
Source: United Nations (1980, 2018)

Figure 3 shows a strong correlation between urbanisation and household income. More urbanised states tended to have higher household income, indicating urban sector employment's wage premium than rural agrarian employment. The economic opportunities in the urban areas attracted the more resourceful segments of the population, contributing to higher income.

Population density

The population density of Malaysia increased from 33 in 1970 to 99 people per square kilometre in 2020. This figure is still relatively lower than 154 people per square kilometre for Southeast Asia. The population density varies widely across states/territories, from 20 people per square kilometre in Sarawak to 1,659 in Pulau Pinang and 8,157 in Kuala Lumpur. In Peninsular Malaysia, Pahang has the lowest population density, at 44 per square kilometre. Between 1970 and 2020, the population density increased more than four-fold in Selangor and Sabah and more than three-fold in Johor and Pahang (Table 5).

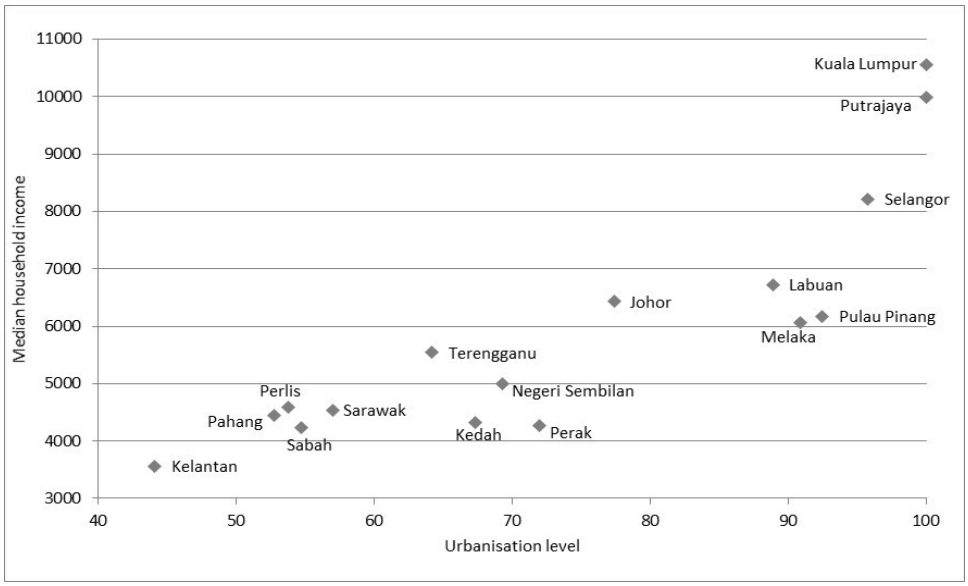

Figure 3: Scatter-plot of urbanisation level and median household income by state
Source: DOSM (various years)

Table 5: Changes in population density by state, 1970-2020

State	1970	2020	% change
Johor	67	209	211.9
Kedah	101	225	122.8
Kelantan	46	119	158.7
Melaka	245	583	138.0
Negeri Sembilan	72	180	150.0
Pahang	14	44	214.3
Pulau Pinang	751	1,659	120.9
Perak	75	118	57.3
Perlis	152	348	128.9
Selangor	199	880	342.2
Terengganu	31	89	187.1
Sabah	9	46	411.1
Sarawak	8	20	150.0
Kuala Lumpur	3,784*	8,157	115.6

*Note: *1980*

Source: DOSM (various years)

DISCUSSION AND CONCLUSION

This paper examines population redistribution and concentration across states and districts and highlights the population concentration in the metropolis. Most past studies examined migration in and out of Kuala Lumpur and Selangor separately (Chitose, 2001; Jali, 2009; Tey, 2014). However, this paper considers the Kuala Lumpur conurbation, or the Klang Valley, as one region because of the ease of accessibility to the workplace, amenities, and services within the region (Linard et al., 2012; Salvia et al., 2020). Following Rees et al. (2017) approach, this study assumed a bidirectional causality between population concentration and socio-economic development. The better opportunities in the more developed states resulted in net migration, and migrants contributed to the socio-economic development of the receiving areas.

Given the complex pattern of human settlement related to socio-economic polarisation, multiple indicators are needed to present the different aspects of population distribution and concentration (Morrill, 1979; Newbold, 1999; Rees et al., 2017). Hence, this paper uses various indicators to highlight the increased concentration of the population in a few states, districts, and metropolia over the past fifty years. Notably, Greater Kuala Lumpur's population increased almost 18-fold during this period. It is home to about one-quarter of the national population. This region is the federal capital site and is the administrative, industrial, commercial, education, health, and transportation hub. Migrants from all over the country have moved to take up jobs in cities where economic activities are most vibrant. In addition, the concentration of institutions of higher learning in Greater Kuala Lumpur has attracted many youths looking for a job and settling down in this region upon graduation.

In some countries, population concentration and dispersion occur simultaneously (Borgegård et al., 1995). Malaysia has implemented various policies to foster more equitable regional development and to redirect the population to small towns and rural areas. Efforts were also made to plan and manage the cities. These policies include the National Urbanization Policy, the National Physical Plan, and the National Housing Policy to provide the necessary physical and social infrastructure for implementing the Habitat Agenda. In addition, an ambitious Corridor Development Plan for the development of five regional growth corridors was implemented under the Ninth Malaysia Plan (2006-2010) to create job opportunities to redirect the population away from the Klang Valley. However, these policies and programs have yet to achieve the goal of population dispersion.

The rapid growth of urban population and concentration of population in major cities have given rise to sustainable development challenges. The existing infrastructures are inadequate to cope with the rapid growth of the cities, resulting in traffic congestion, environmental pollution, escalating housing costs, and crime. The rapid increase in population has also strained social services, such

as education and health facilities, transportation, and garbage disposal. On the positive side, cities are centres of economic growth, providing the impetus for socio-economic innovation and change. The agglomeration of diverse labour pools facilitates knowledge and information sharing, fostering new enterprises and technological innovation for businesses to grow. The Government can also take advantage of the economies of scale to provide infrastructure and social services more efficiently.

ACKNOWLEDGEMENTS

This publication is partially funded by the Faculty of Business and Economics, Universiti Malaya Special Publication Fund.

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Received: 30th June 2022. Accepted: 12th September 2022

