PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 20 ISSUE 4 (2022), Page 150 – 166

DIFFERENTIAL URBANISATION IN MALAYSIA, 1980-2010

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Abstract

In the early 1970s, urbanisation shifted towards counterurbanisation in most developed countries. In contrast, there is little evidence that developing countries will experience counterurbanisation due to the complexity of their historical, economic, and social conditions. To examine the transition process, Geyer and Kontuly (1993) introduced differential urbanisation theory to explain the concentration and deconcentration of populations in urban systems (from urbanisation to polarisation reversal to counterurbanisation). Most studies have applied this theory in developed country settings, but few have done so for developing countries and none have done so in the Malaysian context. This paper tested the theory in the Malaysian setting to consider the extent to which the theoretical assumptions are supported or challenged. In addition, compared to previous papers, this paper focuses far more on the nature of migration flows leading to urbanisation in terms of the relative contributions of net migration and natural increase to population change, as well as origin-destination migration flows in total and according to age structures. The results show that natural increase, rather than migration flows, was the dominant cause of urbanisation in all settlement types. This was due to the population momentum effect of high fertility levels, primarily after the Second World War, which resulted in the birth of a large number of females who later grew to childbearing age. Malaysia experienced the second stage of urbanisation (Intermediate Primate City) after 1980 but had shifted towards the final stage (Advanced Primate City) by 2000. This analysis of three decades (1980-2010), however, shows clear evidence of urbanisation but no evidence of polarisation reversal or counterurbanisation. Due to the continuous rapid urban development and growth in the largest city, the capital metropolitan area, and if the current migration trends persist in the future, Malaysia may never experience polarisation reversal or counterurbanisation.

Keywords: Urbanisation, internal migration, population, city stages, developing country.

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INTRODUCTION

Urbanisation in developing countries has rapidly increased since 1950 and shares some similarities with the urbanisation experienced in developed countries. On the other hand, there are differences, most notably that urbanisation has occurred much faster in developing countries. According to Jedwab, Christianesen, and Gindelsky (2015), it took more than 100 years, from the eighteenth to the nineteenth centuries, for developed countries (particularly in Europe) to reach 40 per cent urbanisation. In comparison, developing countries reached the same stage almost twice as quickly between 1950 and 2010. However, in the early 1970s, most developed countries experienced a change in urbanisation patterns - the concentration of the population in metropolitan areas reached its peak, which was followed by a deconcentration of the population, with small and medium-sized cities experiencing higher net migration flows than the largest city (see Argent & Rolley, 2012; Berry, 1980; Champion, 2003; Coombes, Longa, & Raybould, 1989; Halliday & Coombes, 1995; Kontuly & Vogelsang, 1988). Since then, urbanisation has shifted towards counterurbanisation, which can be interpreted as the movement of the population from a concentrated region to fewer concentrated areas; this includes movement beyond the metropolitan boundaries (Champion, 2003). Counterurbanisation has arisen for many reasons: clustering job opportunities, access to higher-level services, more housing choices, the establishment of new towns, stringent urban planning controls, and regional policies (such as new investment outside major cities) (Hosszú, 2009).

To examine the transition from urbanisation to counterurbanisation, Geyer and Kontuly (1993) introduced differential urbanisation theory to explain the concentration and deconcentration of the population in a temporal sequence within an urban system. Figure 1 shows the model of this theory.

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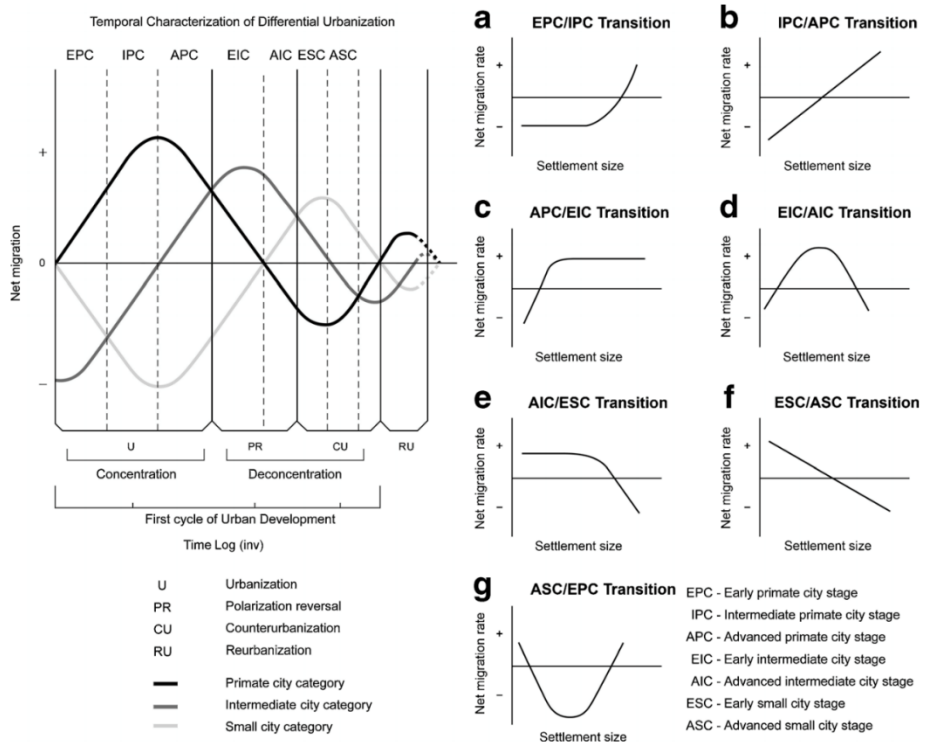

Figure 1: Model of differential urbanisation theory
Source: Geyer Jr and Geyer (2015:3)

The transition between the stages of urbanisation can be identified by a change in which settlement type attracts the greatest net migration flows. For example, the primate city urbanisation stage occurs when net migration to the largest city exceeds net migration to other cities, while counterurbanisation occurs when net migration to small cities exceeds net migration to large and medium-sized cities. Between urbanisation and counterurbanisation, there is a polarisation reversal stage in which medium-sized cities have larger net migration in-flows than large and small cities. Despite the pivotal role of both migration and total population size in informing differential urbanisation theory, some papers have examined the theory based only on the overall population change (Gedik, 2003; Gwebu, 2006; Mookherjee & Geyer, 2011), whilst others have looked only at changes in net migration flows (Champion, 2003; Heikkila, 2003; Tammaru, Kulu, & Kask, 2004). According to Kontuly and Dearden (2003), the application of the theory should be addressed to each demographic component (natural increase and net migration), rather than simply to the total population

change, because the factors influencing each component differ, which may result in the separate components displaying different urbanisation trends. For example, different urbanisation patterns were identified in western Germany between 1939 and 2010, according to the type of measure used (population change, net migration, or natural increase) (Kontuly & Dearden, 2003). To date, most studies have applied differential urbanisation theory in developed country settings (Bonifazi & Heins, 2003; Champion, 2003; Heikkila, 2003; Kontuly & Dearden, 2003; Nefedova & Treivish, 2003; Sander, 2014; Tammaru et al., 2004), with few having done so in developing countries (Gedik, 2003; Geyer, 2003; Gwebu, 2006; Mookherjee, 2003). None have done so in the Malaysian context.

During recent decades, Malaysia has experienced rapid urbanisation and has had the fastest rate of urbanisation of all South-East Asian countries: 70 per cent of the population was estimated to be living in urban areas in 2010 (Yaakob, Masron, & Masami, 2010). The existing urbanisation studies show that large cities in Malaysia have lost their primacy to the surrounding suburban areas due to the continuously declining population growth since 1970 (see Abdullah, 2003; Hasan & Nair, 2014; Osman, Abdullah, & Nawawi, 2017). However, these studies focused only on the total population change of large cities in Malaysia.

The primary contribution of this paper is to present the first application of differential urbanisation theory to Malaysia, with a view to developing a better understanding of the recent history and current trajectory of urbanisation in the country. In doing so, the paper makes several other key contributions to the development and application of differential urbanisation theory. This paper is the first to fully consider the relative contributions of net migration and natural increase to the overall urbanisation process, helping to highlight a potential internal contradiction in a theory based primarily on net migration rates alone. Collectively, the analyses presented offer clearer insights into the process driving differential urbanisation and the considerations that others should take into account when undertaking similar analyses in different country settings.

BACKGROUND

Historically, the modern urban system in Malaysia was first initiated by the British colonial regime to strengthen their control over and further exploit the country. Urbanisation and population growth in Malaya (the name of the country before Malaysia was formed in 1963) were mainly driven by significant international immigration from China and India. These immigrants were allocated to and nearby towns by the British colonial regime due to the increasing demand for war-related workers during the Second World War (Lestari, 1997). After the war, population growth was entirely sustained until 1960 by the natural population increase that occurred as a result of the high fertility levels caused by improved nutrition, preventive health programs, and greater access to curative medicine (Department of Statistics Malaysia, 2021). However, from the 1960s

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onwards, fertility levels began to decline continuously. This was caused by several factors: social change, improved education, women's empowerment in the working sector, and postponements of marriage and childbearing. Mortality, on the other hand, has been declining since at least the 1950s and continues to do so (Department of Statistics Malaysia, 2021).

Besides natural increase, urbanisation and population growth in Malaysia have also been influenced by rural-urban migration. Resettlement programs imposed by the colonial regime forced rural communities to migrate into new settlements with the aim of denying or blocking insurgent forces from receiving support from these communities (Yaakob et al., 2010). Migration provided opportunities for communities to become involved in commercial, trading, and mining activities in the new settlements. Furthermore, the opening of tin mines encouraged the large-scale in-migration of workers, which led to the establishment of more seaports for trading activities. In time, mining and industrial growth were unable to meet the increasing demand for labour caused by rapid rural-urban migration (Yaakob et al., 2010). The large concentrations of the population in cities had a major impact on urban development and growth while also putting pressure on the Malaysian government to devote more expenditure to housing, educational, health, and institutional facilities.

Geographically, the distribution of urban centres in Malaysia is uneven. Mostly located in high-density areas in the west coast region of Peninsular Malaysia, these centres have existed and grown continuously since the colonial period. Major urban centres such as Kuala Lumpur, Georgetown, and Johor Bahru became the main destination for migrants seeking better economic and social opportunities. However, the primacy of these cities has eroded since the 1980s due to a decline in urban population growth, and the population concentration has shifted towards suburban areas (Abdullah, 2003). In 2000, the proportion of the population in the largest city, Kuala Lumpur, was almost on par with the surrounding suburban areas. The same phenomenon occurred in Georgetown and Johor Bahru, where the areas adjacent to these cities had a larger proportion of the population in the same year. The Kuala Lumpur Structure Plan 2020 Report (2003) stated that the decline in population growth is one of the main problems facing Kuala Lumpur (Dewan Bandaraya Kuala Lumpur, 2003).

URBAN AND RURAL FRAMEWORK IN MALAYSIA

The urban-rural framework of Malaysia depends highly on the definitions and measurements used. It has also changed over time. Various urban-rural definitions and boundaries are offered by two Malaysian government agencies: the Federal Department of Town and Country Planning Peninsular Malaysia (FDTCPPM) and the Department of Statistics Malaysia (DOSM). These agencies were created to serve different purposes, hence their different definitions of urban areas. For example, according to the Department of Statistics Malaysia, the

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country had 149 cities in 2010. In contrast, the FDTCPPM identified 288 cities (Federal Department of Town and Country Planning in Peninsular Malaysia, 2016).

According to Yaakob et al. (2010), urban areas in Malaysia were first defined in 1947 by the DOSM as those with a population of 1,000 or more. In 1957, the definition was updated to include municipalities, town council areas, town board areas, local council areas, new villages, and villages. In 1970 and 1980, the definition was revised to avoid including small settlements by increasing the minimum population to 10,000 or more. The definition was further revised in 1991 and 2000 to include adjoining built-up areas where 60 per cent of the population (aged 10 years or more) was engaged in non-agricultural activities and at least 30 per cent of the housing had modern toilet facilities (Hasan & Nair, 2014). In 2010, the modern toilet facilities criterion was removed, and the minimum age for the working-age group was increased to 15 years or above. These changes were made because almost all houses had modern toilet facilities and the Labour Force Survey showed that the working age started at 15. The 2010 definition is given in the following statement, which has been used until now by the DOSM:

> *Gazetted areas with their adjoining built-up areas which had a combined population of 10,000 or more at the time of the Census 2010 or a special development area that can be identified, which had a population of at least 10,000, and where at least 60% of the population (aged 15 years and above) were involved in non-agricultural activities.*

The FDTCPPM (2016) uses a similar definition, with two extra criteria for defining urban areas: 1) a population density of 50-60 people per hectare and 2) the presence of urban infrastructure and facilities. Overall, the agency outlines seven levels of urban hierarchy and the corresponding boundaries: National Growth Conurbation (population of more than 2.5 million), Regional Growth Conurbations (populations of 1.5 to 2.5 million), Sub-regional Growth Conurbations (populations of 0.5 to 1.5 million), State Growth Conurbations (populations of 0.3 to 0.5 million), District Growth Conurbations (populations of 0.1 to 0.3 million), Major Settlement Centres (populations of 30,000 to 0.3 million), and Minor Settlement Centres (populations of 10,000 to 30,000).

The urban-rural boundaries used by both agencies do not provide the comprehensive data needed to adopt a differential urbanisation theory approach or examine urbanisation comprehensively. For example, it is impossible to identify which cities are large, medium, or small from the urban boundaries outlined by the DOSM because all cities are simply characterised as urban areas. Further, migration data is recorded simply as urban-rural, rural-urban, or urban-

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urban at the state level instead of using more detailed urban and rural classifications. Although the FDTCPPM provides a detailed hierarchy of cities and their boundaries, the other information provided is rudimentary (e.g., total population, population density, and total land area). Finally, as has been noted, the definitions change over time, whereas analyses of differential urbanisation theory conventionally adopt a 'static' (over time) set of spatial boundaries (Kontuly & Dearden, 2003).

Given the limitations, the existing urban-rural units from both agencies are not ideal for applying differential urbanisation theory. In contrast, the data relating to the existing small-area units (districts) is sufficient to permit the application of differential urbanisation theory to Malaysia.

RESEARCH METHOD

The data used in this paper was sourced from the Malaysian Censuses of 1980, 1991, 2000, and 2010. Of particular importance was the migration matrix, which captures district-level population flows between origins (places of residence five years prior to the census) and destinations (places of residence at the time of the census), disaggregated by age.

Because migration data is recorded by the census on a five-year basis, no official migration data exists for the first five years of each decade examined in this study (1980-1986, 1991-2005, and 2000-2005). These missing values were estimated by linear interpolation:

$$NM_{t2} = \left(\frac{NM_{t1} \pm NM_{t3}}{2}\right) \pm NM_{t3}$$

WhereNM_{t1} is the net migration of the first five-year period, NM_{t3} is the net migration of the third five-year period, and NM_{t2} is the net migration between NM_{t1} and NM_{t3}.

Once the missing values had been interpolated, the next step was to classify each district by settlement type (see Table 1). Differential urbanisation theory offers no specific guidelines on how to differentiate settlement types, except that they must be located independently from each other (Geyer & Kontuly, 1993). For example, urban built-up areas in medium-sized and small cities must be independent and located beyond the boundaries of larger metropolitan areas. This requirement was met by the existing FCTCPPM settlement hierarchy, which provided the starting point for the classification of districts by settlement type. The FCTPPM settlement hierarchy was simplified to facilitate the analysis. Table 1 maps the FCTPPM settlement hierarchy onto the 'Primate', 'Intermediate', and 'Small' city categories included in the original work on differential urbanisation theory, as well as onto the five-category settlement hierarchy used in this paper. The district classification then had to take

into account the fact that the boundaries of the official FDTCPPM settlement hierarchy respected the shapes of contiguous urban built-up areas rather than the boundaries of the census districts for which census data is available. Thus, each district was allocated to the settlement type that predominated in that district. Figure 2 shows the newly developed district-based urban-rural urban hierarchy.

Table 1: New settlement classification

No.	**Settlement classification in differential urbanisation theory (Geyer & Kontuly, 1993)**	**Malaysia settlement hierarchy** (FDTCPPM**, 2016)**	**New settlement classification**
1	Primate/Largest city	National Conurbation	Capital metropolitan
2	Intermediate-sized cities	Regional Conurbations	Regional metropolitan
3		Sub-regional Conurbations	Intermediate-sized cities
4		State Conurbations	
5		District Conurbations	
6	Small-sized cities	Major Settlement Centres	Small towns/villages
7		Minor Settlement Centres	
8	-	Rural Areas	Remote villages

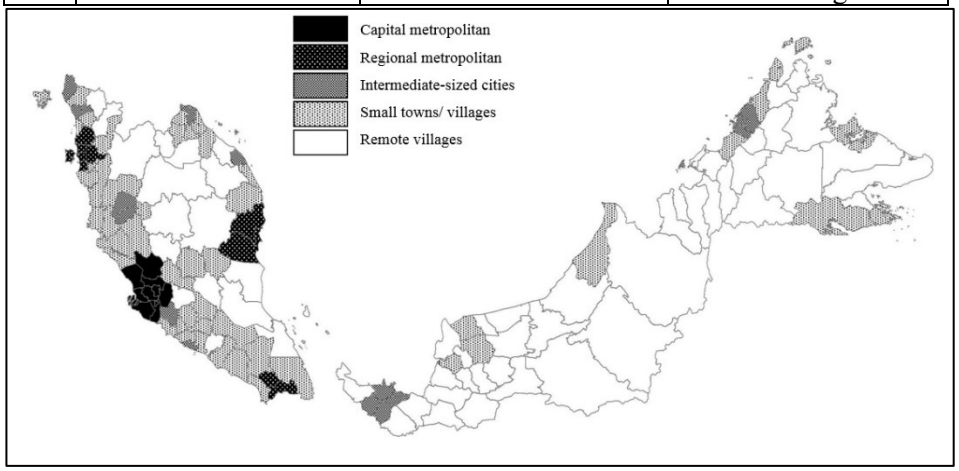

Figure 1: New urban-rural spatial boundaries built using district units

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RESULTS AND FINDINGS

This section presents an analysis of population change in Malaysia in light of differential urbanisation theory. First, as with previous applications of demographic urbanisation theory, the overall population change was considered. This was then contrasted with the other perspectives on urbanisation by focusing solely on net migration flows. Attention was then given to the relative contributions made by natural increase and net migration to the overall population changes – which is unprecedented in applications of differential urbanisation theory – helping to highlight a potential shortcoming in previous analyses that fail to do so.

Overall population change

Since 1980, the population of Malaysia has continued to grow but the growth rate has slowed. This trend holds true across all settlement types, from the capital metropolitan core to remote villages. The more urban the area, the higher the growth rate, with only one exception: remote villages out-stripped growth in small towns/villages in 1980 (Figure 3). As a result, since 1980, the population of Malaysia has continued to urbanise, with capital and regional metropolitan areas gaining an ever-greater share of the nation's population at the expense of small towns/villages and remote villages (Figure 4).

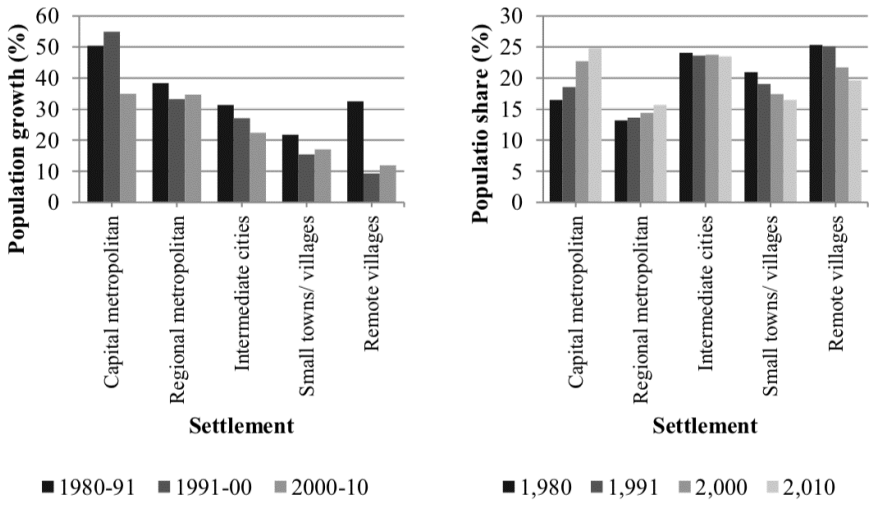

Figure 3: Population growth and share by settlement type, 1980-2010

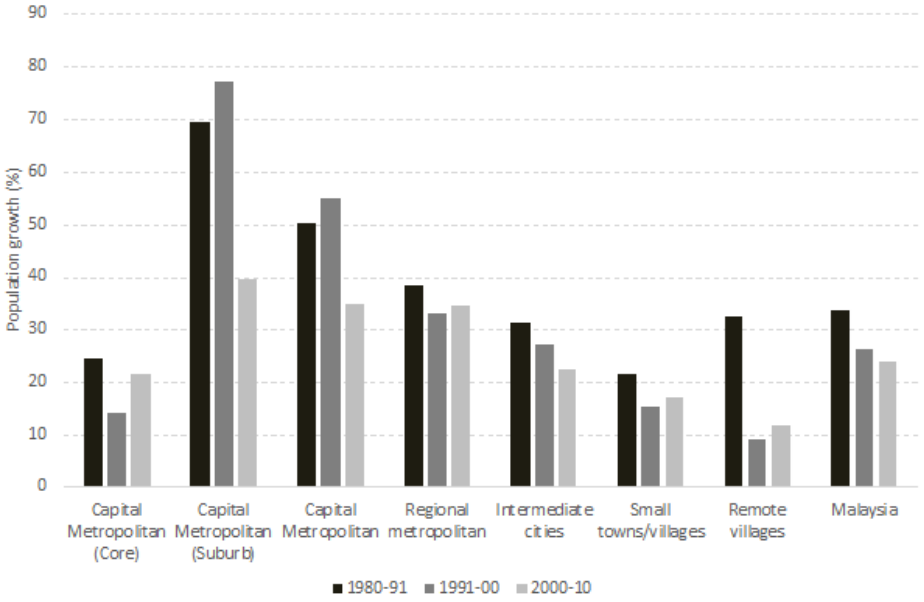

Figure 4: Population growth in Malaysia, 1980-2010

Several authors have used evidence of this kind to situate the country being assessed within a particular stage of the differential urbanisation theory model (Gedik, 2003; Gwebu, 2006; Mookherjee & Geyer, 2011). This approach is problematic for two reasons. First, it fails to disentangle the relative contributions to urbanisation of net migration and natural increase (the local surplus/deficit of births over deaths), making the implicit assumption that both are pulling in the same direction. Second, Geyer repeatedly made it clear that DUT was conceived in relation to the changing nature of migration flows between types of urban areas, not in relation to overall changes in their population or variations in natural increase rates (Geyer Jr & Geyer, 2015). Geyer's rationale for this focus was based on the mutually reinforcing nature of flows in capital, jobs, and people. In this paper, we tread a middle ground. We share Geyer's sentiment that migration flows ultimately tell us more about the nature of the urbanisation process than variations in natural increase rates between different categories of urban areas. On the other hand, we recognise that differences in natural increase rates can lead to urbanisation, both in the narrow sense of 'growth in urban share of the population' and in the broader sense advanced by Dyson (2010), in which population growth arising from natural increase is in turn the trigger for the kinds of economic, political, and societal transformations and migration flows that lead to urbanisation as an economic/development process. To tread this middle ground, we first examine the variation in net migration rates by settlement type, in line with differential urbanisation theory. We then seek to

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disentangle the relative contributions of net migration and natural increase to the overall population change, providing a clearer context for a subsequent analysis of the direction of these flows.

Net migration flows

As illustrated in Figure 1, differential urbanisation theory classifies the stages of the urbanisation process by appealing to the rates rather than the sizes of net migration flows. Urbanisation is observed when the net migration rate in large cities exceeds the rate in medium-sized and small cities. Polarisation reversal occurs when the net migration rate in medium-sized cities exceeds the rate in large and small cities, while counterurbanisation arises when net migration into small cities exceeds net migration into large and medium-sized cities. In recent decades, net migration rates in Malaysia have followed three basic trends, as illustrated in Figure 5. First, net migration rates have been substantially larger in metropolitan areas and small towns/villages than in intermediate cities and remote villages, although the gap is narrowing. Second, net migration rates have generally fallen over time, in particular, across all settlement types over the last two intercensal periods. Third, whilst the capital metropolitan core experienced continuous net outflows, the capital metropolitan suburban areas experienced continuous net inflows. This represented a phase of population over-spill rather than counterurbanisation. Relating these findings to differential urbanisation theory, Malaysia from 1980 to 2010 was clearly still at the urbanisation, or concentration, stage, due to the continued dominance of large net inflows into the largest city, i.e., the capital metropolitan area.

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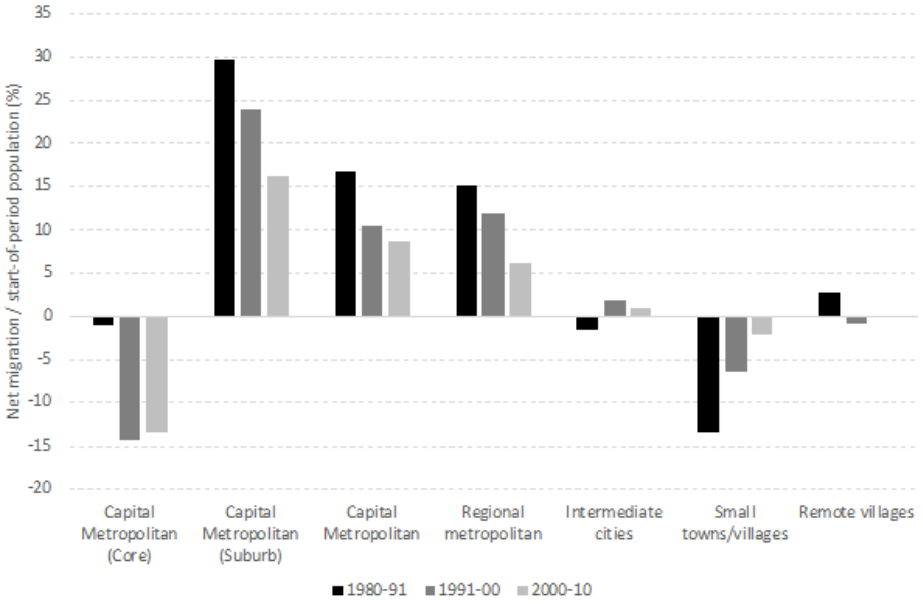

Figure 5: Net migration rates by Settlement Type, 1980-2010

Relative contributions of net migration and natural increase to population change

Geyer and Geyer (2015) attempted to analyse net migration flows for South Africa. However, in the absence of suitable data, they had to use the excess of local population change over national population change as a proxy for net migration. Of necessity, this meant assuming that net migration rates varied by location and natural increase rates did not. However, urban areas are known to typically experience lower fertility rates than rural areas, and they may experience either an 'urban penalty' or an 'urban advantage' in terms of death rates, depending on their stage of economic development (Allan et al., 2017; Lerch, 2019). Figure 6 reinforces this message: in Malaysia, the contribution of natural increase to the overall population changes ranged from 57% to 200%, depending on the time period and settlement type, with the corollary that the contribution of net migration to population change ranged from +43% to –100%.

As Geyer and Geyer (2015) noted, in a developing world context, natural increase can dominate the overall population change, which is the case in Malaysia. In all areas and at all times, natural increase contributed more than 50% of the observed population change. This meant that urbanisation, in the sense of growth in settlement size, persisted even in urban areas that had significant net migration out-flows, such as the capital metropolitan core. One of the main reasons for this was population momentum. Although fertility in Malaysia has steadily dropped since the 1960s, the number of women of childbearing age increased as fertility rates remained above the replacement level until 2012,

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despite starting to decline in 2013 (Department of Statistics Malaysia, 2021). According to Blue and Espenshade (2011), for countries still in the process of demographic transition, population momentum can significantly impact population growth. This contrasts with the limited influence of population momentum on countries that have completed the demographic transition and have both low fertility rates and an ageing population (Andreev, Kirill; Kantorová, Vladimíra; Bongaarts, 2013). In addition, a major increase in life expectancy arising from improved nutrition, increasing numbers of preventive health programs, and better access to curative medicine has also influenced the rate of natural increase (Hirschman, 1980).

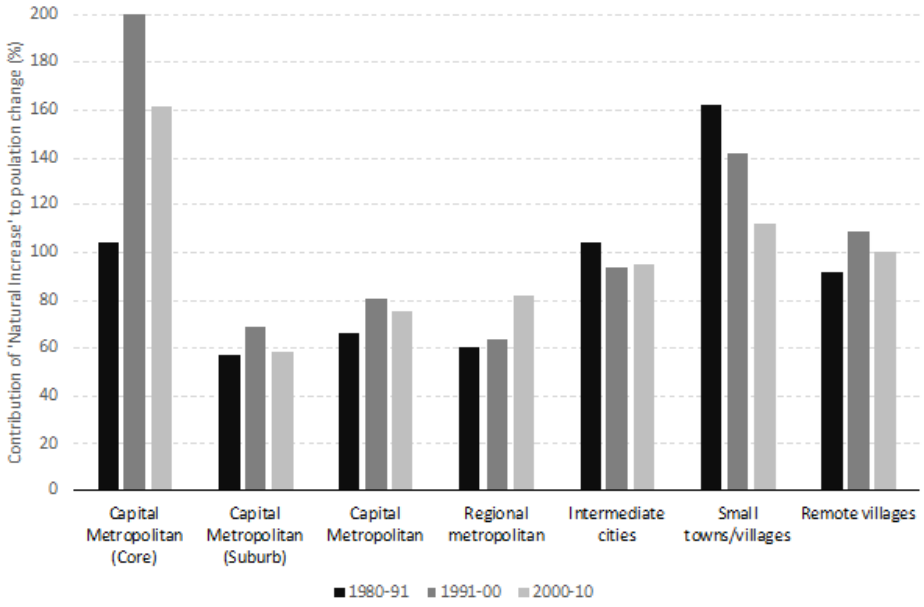

Figure 6: Natural increase by Settlement Type, 1980-2010

Three other important findings are evident from Figure 6. First, from 2000 to 2010, natural increase in metropolitan cities (the capital and regional metropolitan areas) contributed less to population change than to other settlement types. Second, without net out-migration, population growth in the capital metropolitan core and the small towns/villages would have been even greater. Third, net migration had a minimal influence on population change in intermediate-sized cities and remote villages.

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DISCUSSION AND CONCLUSION

From the perspective of demographic urbanisation theory, Malaysia between 1980 and 2010 was firmly located in the urbanisation stage due to the dominance of large net inflows into the largest city, i.e., the capital metropolitan area. It is unclear whether this indicates that the country will experience polarisation reversal or counterurbanisation in the future. The continuous urban sprawl and rapid growth of urban development in the capital metropolitan area (e.g., large-scale projects such as new townships and high-speed rail lines) may distort the deconcentration process and pressure the Malaysian government to devote more expenditure to housing, infrastructure, and amenities in that city, thus helping to maintain its primacy. The Malaysian government has plans to balance the population across the regions (e.g., through rural and regional settlement schemes and the establishment of educational institutions far from metropolitan cities to stimulate growth in other areas).

Due to limits on government intervention, Malaysia in the future may look more like a standard developing country in terms of its urbanisation pathway. In India, for example, the change of the urbanisation pattern into polarisation reversal was mainly due to the effectiveness of various programs and policies during the post-independence period that aimed to foster balanced settlement sizes and population growth. One of these policies limited the concentration in large cities by encouraging concentration in other cities through infrastructural development and the establishment of transportation networks (Mookherjee & Geyer, 2011; Seto, 2011). However, the level of government intervention is low in India, which is similar to Malaysia, where all the programs and policies introduced are designed to encourage rather than force the population to live in other cities or rural areas. In contrast, the level of government intervention in China is stricter than in India and Malaysia. For example, Jain et al. (2013) argued that in India, the inadequate physical infrastructure and lack of institutional capacity to decentralise might lead the country to re-urbanise instead of counterurbanise. It remains unclear whether counterurbanisation in Malaysia will be similarly hampered.

Kontuly and Dearden (2003) suggested that the application of differential urbanisation theory in the future should incorporate analyses of not only overall population change but also the demographic components (natural increase and migration) contributing to this change. We believe that this is the first paper to fully take up this challenge. Based on the evidence presented here, in developing country contexts such as Malaysia, natural increase and migration are mutually complementary, with natural increase dominating the spatial redistribution of population and the urbanisation process. This contrasts with the situation in more industrialised countries that have already fully concluded their demographic transition and where migration rather than natural increase is the key driver of population change at the local level. Our results also show that the

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relative contributions of natural increase and migration to the overall population change vary by settlement type, highlighting the need to avoid (where possible) the assumption of a spatially invariant relationship between these two aspects of population growth.

ACKNOWLEDGEMENT

Census data was kindly provided by the Department of Statistics Malaysia (DOSM).

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Received: 26th September 2022. Accepted: 23rd November 2022

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