

## Analysis of Malaysia's Smart Cities' Impact on Income, Expenditure, and Social Capital

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### Abstract

Smart cities are able to automate routine functions towards improving quality of life (Piro *et al.*, 2014); (Batty *et al.*, 2012). While the smart cities are filled with firms experiencing higher rates of return, the impact on marginalised lower income group are negatively impacted due to the changes in urban landscape which cause “spirals of gentrification” which then led to “geographical polarisation” (Graham, 2002; Hollands, 2008). This study analysed secondary data and found increasingly income inequality – households are earning higher income but income distribution and gap are increasing. Social capital accumulation, housing, and expenditure gaps are increasingly observed in Penang, Johor, and the Greater Kuala Lumpur region.

**Keywords:** Income inequality; Smart city; Social capital.



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### 1. Introduction

Smart cities were envisioned in many past works of fiction, and today many of the futuristic scenarios such as smart traffic systems and cashless society have come true. A city is a geographical destination where economy, institutions, and civic organisations unite towards a common goal (Mumford, 1937). Smart cities are able to automate routine functions towards improving quality of life (Piro *et al.*, 2014); (Batty *et al.*, 2012); Smart cities adds Information and Communication Technology (ICT) into the Mumford (1937)'s definition, and therefore are cities where ICT play a vital role in the economy, citizens, governance, transportation, natural resources, and in improving quality of life (Batty *et al.*, 2012); (Piro *et al.*, 2014). ICT infrastructure itself does not equate to smart cities, but that technology will empower and educate citizens to actively engage in, and be more efficient in smart cities (Gil and Navarro, 2013); (Neirotti *et al.*, 2014). The urban domains can be divided into ‘hard’ or tangible domains such as natural resources and energy, transport and mobility, and buildings; and ‘soft’ or intangible domains such as living, government, economy and people. The ‘smart city’ label is usually equated with positive outcomes that could potentially downplay the negative aspects that these ICT infrastructures have on a city (Hollands, 2008). ICT infrastructure does not automatically make cities better, but could potentially improve the quality of life of citizens (Neirotti *et al.*, 2014). This paper aims to analyse income, housing affordability, consumption, and social capital in selected Malaysian smart cities.

### 2. Literature Review

The success of Silicon Valley, the proto smart city; spurred governments to build smart cities in Sao Paolo, Brazil; and Bangkok, Thailand; (Mahizhnan, 1999); Brisbane, Australia; and Edmonton, Ottawa, and Halifax in Canada (Hollands, 2008). Some nations went to the extent of creating smart cities from scratch such as Cyberjaya in Malaysia, and the Songdo International Business District in South Korea.

The goal an ICT-based economy is spearheaded by the government, and with involvement the private sector, instead of the initiative being led by the private sector (Mahizhnan, 1999). An ICT-based economy potentially contradict strict censorship laws, carries pervasive Western influence to non-Western societies, and creates digital divide (Hollands, 2008; Mahizhnan, 1999). The first smart city in Malaysia is Cyberjaya. It started in 1998, as part of the Multimedia SuperCorridor., which has since expanded to cover CyberCenters and CyberCities located other areas in Malaysia, especially in the Greater Kuala Lumpur region (Bunnell, 2015; Performance Management and Delivery Unit PEMANDU, 2013).

Urbanisation began in 1991 in Malaysia, when more than half of its population settled in urban areas (Abdullah, 2012). The areas that experienced high population were the metropolitan areas of the states of Penang, Kuala Lumpur (KL), and Johor (Abdullah, 2012) which are where most CyberCenters (33 of 36 centers) and Cybercities (6 of 7 cities) are located. Regional planning in late 1960 and 1970s aimed to balance the socioeconomic development and were focussed in urban centres, but later on centered on ‘growth corridors’ in periphery cities that specialise in niche industries such as electronics, and education (Abdullah, 2012); (Malaysian Investment Development Authority MIDA, 2015). Malaysia's ICT-based economy indicators from World Bank (2017) such as ICT Service Export, Fixed Broadband Subscription, are still lagging behind countries such as Singapore, Brazil, and India.

The impact on the marginalised lower income groups extends even further than just widening economic, income and education gaps, but also commerce, housing, and overall quality of life. Lower income groups subsist on a cash-driven economy, rely on public infrastructures, and rarely own ICT devices required to function in today's economy (Graham, 2002). In Malaysia, Bunnell (2015) posits that the MSC benefitted both foreign and local ICT corporations and the skilled middle class, while the losers are natives (*orang asli*) and lower economic class citizens that were evicted to make way for these cities. Positive impacts of smart cities may not reach the urban poor such as those in squatter areas and pockets such as the Malay Reserve Areas (MRAs) of the KL: Gombak, Selayang, Sungai Penchala, Segambut, Kampung Baru, and Datuk Keramat (Siwar and Kasim, 1997).

Social capital is important, to the economic and daily functioning of individuals, in addition to formal institutions and infrastructures (Antoci *et al.*, 2012; Sen, 1999). Social capital can be defined functionally as the combination of trust, norms, networks and associations, as well as civic engagement that can be leveraged by individuals towards achieving specific goals (Durlauf, 2002; Morris, 1998; Narayan, 1999). Social capital that bridges income groups may be hard to accumulate due to the reduction of municipal and banking counter services as more services are moved online (Rosli, 2016).

### 3. Methodology

Data from the Department of Statistics Malaysia (DOSM) (Department of Statistics Malaysia, 2015), World Values Survey (WVS) 2010-2014, Khazanah Research Institute (KRI) State of the Households I and II reports, were extracted for Putrajaya, Kuala Lumpur, Selangor, Penang and Johor were analysed. The 'price-to-income ratio' or 'median multiple' is a globally acceptable measure of housing affordability (Khazanah Research Institute, 2015) (Demographia, 2015), with the three time median multiple as the threshold used by the Eleventh Malaysia Plan (KRI, 2015). Housing prices were obtained from property websites [www.iproperty.com](http://www.iproperty.com) and [www.propertyguru.com.my](http://www.propertyguru.com.my). On-the-ground data on retail and selected Western food and beverage outlets were collected from Puchong, Cyberjaya, and Damansara and mapped out using the Google's My Map application. The Social Capital Index (SCI) was calculated for Malaysian states using the World Values Survey (WVS) database for the WVS 2010-2014.

### 4. Data Analysis

Based on data from DOSM, the Malaysian median and income is RM4,585 and RM6,141 respectively. Among the three states (Selangor, Johor and Penang) and two federal territories (Kuala Lumpur (KL) and Putrajaya), KL has the highest median and median income at RM7,620 and RM10,629. In terms of median and mean income growth rates in 2014, only Johor, KL, and Putrajaya had compounded median and mean income growth rates higher than the national average

However, among the regions, KL is the most income-unequal state in Malaysia, with a Gini Coefficient of 0.407, compared to the national average of 0.401 (Khazanah Research Institute, 2016). Based on 2014 DOSM data on percentage of households and income share of median income for three income groups: Less than RM4,000 per month, RM4,00-8,000 per month, and above RM8,000 per month, Penang has the highest percentage of households with incomes below RM3,999 at 36.9 percent. In Selangor, Johore, and Penang, highest proportion of households and income share are those in the RM4,00-8,000 income per month category. Putrajaya and KL's highest income and household share are for the highest income category. Greater KL (Kuala Lumpur, Putrajaya, and Selangor) have the highest median income, and more than half of the population in these states and territories are enjoying such high earning power. However, this comes at the price of the remaining households having to make do with a smaller income share than their counterparts in Johor and Penang.

KRI's median multiple housing affordability indicator shows that KL and Penang homes are severely unaffordable, with median multiples of 5.5 and 5.2 respectively. Both of these figures are above the 4.4 median multiple calculated for Malaysia. Johore homes are seriously affordable with a median multiple of 4.2, while Selangor homes are moderately affordable at 4.0 median multiple.

In the pioneer smart city in Malaysia, Cyberjaya, five types of housing, namely studio apartments, condominiums with semi or full facilities, three-storey terrace homes and detached homes' prices were obtained and the median multiple affordability calculated, using Selangor's median income of RM74,568. Most of the housing available in are unaffordable to the average citizens of Selangor. The cheapest studio apartment with no bedrooms and one bathroom is moderately unaffordable with a median multiplier of 3.6. Other housing types range from moderately unaffordable, to severely unaffordable.

Puchong is a fairly new township twenty kilometres from Cyberjaya, that developed from a sleepy mining town in the 1980s (Oh, 2015) to a bustling modern township in tandem with Cyberjaya's growth. Within a sample area covering the 47100 postal code area of Puchong, there are six types of housing, namely five-storey walk-up apartments (three bedrooms with either one or two bathrooms), multi-storey apartments, condominiums double-storey terrace houses, and bungalows. The median multiple affordability was calculated and shows that only the five-storey walk-up apartments which has three bedrooms and one bathroom, with a build-up area of 650-700 square feet are affordable. Four out of six types of housing are severely unaffordable for Selangor citizens.

Food expenditure in urban Malaysia is expensive. In Cyberjaya, there is one branch the American fast food chain McDonalds and two branches of the American coffee shop chain Starbucks The number of expensive food outlets compared to affordable ones in Cyberjaya is an indicator of the "spirals of gentrification" described by Graham (2002). Spirals of gentrification is also observed in two smart cities; Puchong and Damansara. In a Puchong,

there are four branches of the American fast food chain McDonalds and four branches of the American coffee shop chain Starbucks. Meanwhile, in an area of 16.5 sq. km in Damansara, there are four Cybercentres, and three McDonald's outlets as well as five Starbucks coffee shops.

Another indicator of spirals of gentrification in Cyberjaya, Puchong, and Damansara are the retail outlets that cater to the upper middle and higher income groups. In Cyberjaya, there are two main shopping centres, while within the area of study in Puchong, there are two malls, three hypermarkets, and two wet markets. There are many well-equipped malls and hypermarkets for such a small area, and too few wet markets selling affordable products for the lower income groups. In the area of study in Damansara, there are six malls, two hypermarkets, and a departmental store. There is a wet market and several smaller-scale grocery shops. The density of higher-end retail outlet is more chronic in Damansara as the area is half the area studied for Puchong.

The *SCI* for Penang is the highest at 3.88 among Johor, Penang, Selangor and KL. The *SCI* for Penang, Selangor (3.83), and KL (3.82) is higher than the Malaysian average of 3.79, while the *SCI* for Johor is slightly lower than the Malaysian average at 3.78. States and regions with smart cities have higher *SCI* than the national average. A cross-tabulation of *SCI* with education level shows that individuals with at least tertiary education has the highest social capital. The increasing online nature of banking and government services will curtail social capital accumulation for the lower income classes as a result, especially in terms of trust and networks, as citizens who lack access and are not empowered with relevant skills to access the online facilities may view these systems and individuals associated with them, with distrust. This is similar to the phenomenon in the United States (Graham, 2002) citing Schiller, 1999), where marginalised citizens and neighbourhoods are excluded from formal services such as financial service, as ICT infrastructure are gradually emphasising online services, and are unlikely to expand to include marginalised citizens and area.

## 5. Conclusion

As Malaysia's development centers around developing smart cities that focus on information and communication development (ICT), policy-makers ought to consider the inclusivity of these development policies. This study has shown that while income in Kuala Lumpur, Putrajaya, Selangor, Johore, and Penang is relatively higher than that for the rest of Malaysia, this distinction comes at a price of unequal income distribution. Housing in these states and federal territories range from unaffordable to severely unaffordable. Retail outlets and western food franchises are indicators of spirals of gentrification in Cyberjaya, Puchong, and Damansara. Average social capital is higher in Selangor, Kuala Lumpur, Penang, and Johore. Digital divides form when public spheres of interaction turn digital, and disenfranchise citizens from the lower income group from forming social capital.

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