

Ageing Population and Rising Income Inequality in Post-Handover Hong Kong

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ABSTRACT

As reflected in the rising Gini coefficient, widening income disparity in Hong Kong in the last few decades is indisputable. The coefficient rose from 0.518 in 1996 to 0.539 in 2016. During the same period, the share of singleton households picked up gradually from 14.9 per cent in 1996 to 18.3 per cent in 2016. During the post-handover period, household composition change explained 11.0 per cent of the increase in variance of log income. Empirical evidence suggests that households with three or more members had lower income dispersion than those of singleton and two-person households. If the percentage share of small households keep increasing, the income dispersion also continues to widen. In 1996, the share of zero income singleton households stood at 0.7 per cent and the percentage share jumped to 7.2 per cent in 2016. Most of these zero-income one-persons households are retired elderly. In Hong Kong, most people lack retirement planning. The increasing number of singleton households with zero income exert tremendous financial pressure to the government. If the government does not properly address these issues, these trends could lead not only to higher income inequality but also to a serious social problem.

Keywords: Income inequality, ageing population, household composition, labour economics.

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1. INTRODUCTION

Since the unprecedented handover of sovereignty from the United Kingdom to China in 1997, Hong Kong experienced higher and higher income inequality. As reflected in the rising Gini coefficient, widening income disparity in the last few decades is indisputable. The coefficient rose from 0.451 in 1981 to 0.518 in 1996 and then to 0.539 in 2016 (Census and Statistics Department 1993; 2017a). Lui (2013) demonstrates that Hong Kong's economy looked booming and prosperous before the historic transition. Good outlook, however, was turned into economic downturn shortly after the handover. Before the handover, the labour market was in full employment with a record low unemployment rate of 2.2 per cent. Right after the handover, the unemployment rate rose to 4.7 per cent and 6.2 per cent in 1998 and 1999 respectively, which represented an increase of 2.5 percentage point and 4.0 percentage point.

In response to the deteriorating economic situation, it was widely reported that Hong Kong government sought help from the Mainland authority. Lui (2018) argues that the Mainland authority responded by taking immediate steps to help boosting Hong Kong economy. For example, in 2003, the Mainland authority announced the "Individual Visit Scheme" (Legislative Council Secretariat 2014), which had immediate and direct impact on the number of Mainland visitors to Hong Kong. Tourism industry and retailing benefitted the most and the economy regained momentum for growth in the following years.

According to the latest official labour force statistics released in April 2018, the seasonally adjusted unemployment rate stood at 2.9% in the first quarter of 2018 (Census and Statistics Department 2018a). Economists would classify Hong Kong's labour market is at a state of full employment. Behind the economics success, however, not every citizen can share the fruits and enjoy similar wage growth. The income gap between the rich and the poor increased significantly in the last decade. The official Gini coefficient increased from 0.518 in 1996 to 0.539 in 2016 (Census and Statistics Department 2017a). Inevitably, widening income distribution will create social tension in the community. To add fuel to the social tension, property price escalated rapidly after the handover. Demographia (2016) presents statistics showing that Hong Kong's property is among the world's most unaffordable. Not only younger generation but also middle-income class both find local property unaffordable.

In response to the widening income gap and ever increasing political pressure, the Hong Kong Special Administrative Region Government took three major steps to address the issue. First, it introduced the statutory minimum wage on 1 May 2011 (Labour Department 2015). Labour unions and political parties had been fighting for this for decades and the introduction of minimum wage was a major success to labour movement in Hong Kong. The statutory minimum wage gradually increased from HKD28 per hour in May 2011 to HKD34.5 per hour in May 2017 (Labour Department 2018).

Second, the administration set the official poverty line in September 2013, which was defined as half of the median monthly household income, prior to government intervention like tax and social benefits transfers. In other words, there are different poverty lines for different household sizes. According to the government poverty report, the post-intervention poverty rates were much lower than those of pre-intervention rates (Government of the HKSAR 2015). Third, the government increased the expenditure on various social welfare programmes.¹

Lui (2013) presents stylised facts of the widening income distribution 15 years before and 15 years after the handover. He presents empirical evidences to examine the relationship between rising income disparity and various socio-economic factors, such as economic restructuring, expansion of higher education, composition change of the population and provision of public housing etc. This article focuses on the changing household composition and ageing population and their impact on income disparity.

It should be noted that rising income inequality *per se* is not necessarily a terrible thing (see, for example Becker 2011; Dabla-Norris *et al.* 2015). A certain degree of inequality actually provides strong motivation for people to work harder, to invest in human capital and to improve their productivity. On the other hand, inequality may lead to lower social mobility and higher crime rate (see, for example, d'Hombres *et al.* 2012). Policymakers around the world understand the social tension created when a significant portion of the population is not reaping the benefits of economic success. Although there was no consensus of the impact of rising income inequality, there was a consensus that a few major issues, such as poverty and deprivation, should receive greater attention by policy makers (Weiner and Monto 1998). Economists, sociologists and policy makers around the world are searching for a panacea to combat poverty and inequality with no success. While Hong Kong, Mainland China and many countries are promoting entrepreneurship, Bonito *et al.* (2017) argue that entrepreneurship has little or no impact on poverty and income disparity in the Philippines. Researchers, however, suggest that non-conventional methods should be considered. For example Abdelbaki (2013)

¹ For details please refer to the annual Budget Speech announced by the Financial Secretary.

argues that collection of Zakat from different sectors can eliminate poverty in Muslim countries as well as achieving desired justice in income distribution.²

Datasets

Most of the statistics presented in this paper were extracted from official publications or downloaded from official website of the statistical authority in Hong Kong, i.e. the Census and Statistics Department. However, detailed breakdown of the income disparity by household size is not available from secondary data. In order to fill the data gap, this paper makes use of the five per cent random subsamples of 1996 and 2016 Hong Kong Population By-Censuses obtained from the Census and Statistics Department.

As Lui (2007) points out clearly that all widely used income inequality measures differ in their sensitivity to different changes in the distribution of income. Braun (1988) argues that the frequently reported Gini coefficient is more sensitive to the middle of the income distribution but not sensitive to changes in the top and bottom ends. In addition to using Gini coefficient, this paper also presents Theil index and Atkinson index to capture the changes at the bottom and top segments of the income distribution. In other words, by studying the changes of Gini coefficient, Theil index and Atkinson index, we can understand the changes in the top, middle and bottom segments of the whole income distribution. Moreover, economists also examine the changes in decile ratio as well as the variance of log household income. In this paper, all of these five income inequality measures are used.

2. RISING INCOME INEQUALITY AND CHANGING HOUSEHOLD COMPOSITION

Since the handover on 1st July 1997, two catastrophic events swept through Hong Kong economy and changed the peaceful mindful of its citizens. Right after the handover, the Asian financial tsunami hard hit many economies in Asia and Hong Kong was one of the most affected by the crisis. With the benefit of hindsight, it was believed that the slumping Thai baht triggered the crisis with the fear of worldwide economic meltdown. In August 1998, the overnight interest rate gone mad and reached the historic high of 500 per cent in Hong Kong, of which also led to unprecedented deflation of six consecutive years (Lui 2011). The second event was caused by then unknown virus that attacks human respiratory system. In March 2003, this extremely contagious coronavirus scared away foreign visitors and local shoppers. Within a short period of time, Severe Acute Respiratory Syndrome (SARS) swept the economy and numerous retailers and restaurants were closed down. Thanks to the help of the Mainland authority by implementing new policy to encourage mainland visitors to visit Hong Kong, tourism industry in general, retailing and restaurants in particular, rejuvenated. This also turned chronic deflation into mild inflation in 2005 (Lui 2011).

Table 1 presents the nominal GDP, GDP per capita and median household income from 1997 to 2017. From the first column, we can see that the nominal GDP increased from HK\$1,373 billion in 1997 to HK\$2,662.3 billion in 2017, which represents an increase of 93.9 per cent in two decades. On the contrary, the GDP per capita only increased from HK\$211,592 in 1997 to HK\$360,220 in 2017, which represents an increase of 70.2 per cent. During the same period, the population size expanded from around 6.5 million to 7.4 million. Bearing in mind, Hong Kong was negatively affected by two major catastrophic events for several years and was able to maintain such a commendable economic growth.

² Zakat, the giving of alms to the poor and those in need, is a religious obligation for all Muslims of sound mind and means.

Table 1
Nominal GDP Per Capita and Median Household Income

Year	GDP (\$Mn)	GDP Per capita	Median Household income
1997	1,373,083	211,592	19,500
1998	1,308,074	199,898	17,000
1999	1,285,946	194,649	17,000
2000	1,337,501	200,675	18,000
2001	1,321,142	196,765	17,000
2002	1,297,341	192,367	16,300
2003	1,256,669	186,704	15,500
2004	1,316,949	194,140	15,700
2005	1,412,125	207,263	16,000
2006	1,503,351	219,240	16,800
2007	1,650,756	238,676	18,000
2008	1,707,487	245,406	18,500
2009	1,659,245	237,960	17,700
2010	1,776,332	252,887	18,300
2011	1,934,430	273,549	20,000
2012	2,037,059	284,899	21,100
2013	2,138,305	297,860	22,400
2014	2,260,005	312,609	23,700
2015	2,398,280	328,924	24,400
2016	2,490,703	339,490	25,000
2017	2,662,637	360,220	27,300

Note: All numbers are expressed in Hong Kong Dollars at current market prices. Source: Census and Statistics Department (2018b, 2018c). While GDP per capita statistics data are annual data, the median household income statistics are quarterly data as at the fourth quarter of the respective years.

The last column of Table 1 shows the median household income for the period from 1997 to 2017. The median household income stood at HK\$19,500 in 1997 which was recorded an increase of HK\$7,800 to HK\$27,300 in 2017, i.e. an increase of 40 per cent in the last twenty years. Comparing the 70.2 per cent growth rate of GDP per capita with that of 40 per cent increase in median household income, it is obvious that not all households could reap the same benefit of the economic success of the economy

In other to take a full view of the variation in income disparity of the whole distribution, five widely used inequality measures are presented in Table 2, namely (1) the Gini coefficient, (2) the Theil index, (3) the Atkinson index, (4) the variance of log income, and (5) the decile ratio.

Table 2
Household Income Distribution, 1996 – 2016

	1996	2016
Gini Coefficient (Official)	0.518	0.539
Theil Index	0.367	0.383
Atkinson Index	0.326	0.332
Variance of log income	0.908	1.048
P ₅₀ /P ₁₀	3.182	4.216
P ₉₀ /P ₅₀	2.829	3.200

Sources: Official Gini coefficients are extracted from various population census reports and other statistics are author's own tabulation from the five per cent random subsamples of 1996 and 2016 Hong Kong Population By-Censuses.

The most widely reported official Gini coefficient is shown in the first row of Table 2. In a world of perfect equality where everyone enjoys identical income, the Gini coefficient equals to zero. In the worst opposite extreme, hypothetically one person takes all and the rest of the population get nothing, the Gini coefficient equals 1. In 1996, i.e. shortly before the handover, the official Gini coefficient stood at 0.518. Twenty years after the handover, however, the coefficient rose to 0.539. This coefficient is very high by international standard, which means the income distribution was highly uneven in Hong Kong. Since Gini coefficient is more sensitive to income differences of the middle part of the income distribution, increasing Gini coefficient reflects that income disparity of the middle class was worsen during the period from 1996 to 2016.

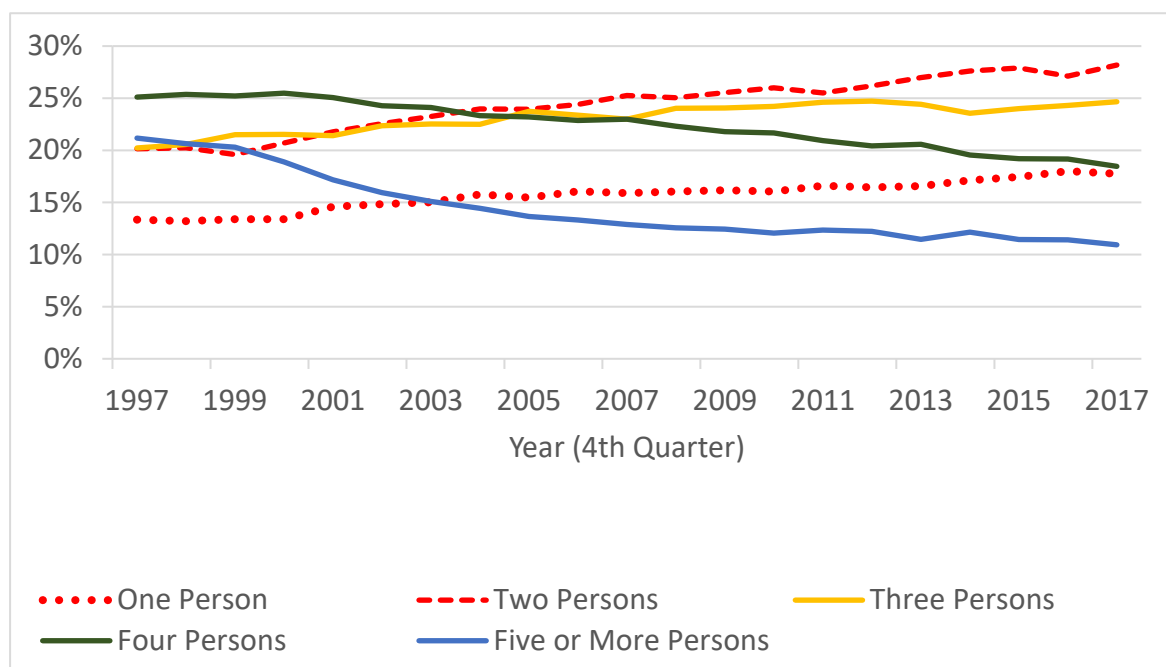
For changes in the bottom and upper parts of the income distribution, we can examine the changes in Theil index and Atkinson index. From Table 2, Theil index increased from 0.367 in 1996 to 0.383 in 2016, which means the income distribution of the lower income group became more uneven. Moreover, the Atkinson index also experienced a mild increase from 0.326 to 0.332 during the same period. These results indicated that the inequality problem deteriorated in the upper part of the income distribution. In short, these three sets of statistics tell us that Hong Kong's rising inequality problems became more serious across the whole spectrum of the middle-income class, the rich and the poor.

The other three income inequality measures presented in Table 2 also reflect rising disparity. The variance of log household income rose from 0.908 in 1996 to 1.048 in 2016. In general, most people are more concern about the income disparity problem of lower household income group relative to the middle-income class. The first decile ratio P₅₀/P₁₀ captures the income disparity between the poor and the middle class while the second decile ratio P₉₀/P₅₀ shows the income dispersion between the rich and the middle class. From Table 2, we can see that the first decile ratio, P₅₀/P₁₀, increased from 3.182 in 1996 to 4.216 in 2016, which represents an increase of 32.5 per cent. This result suggest that households of the middle-income class enjoyed much higher income growth than those households at the bottom of the income distribution. On the other hand, the second decile ratio, P₉₀/P₅₀, changed from 2.829 to 3.200 during the same period, which represents an increase of 13.1 per cent during the last twenty years. It means the income gap between the rich and the middle-income class widened in the post-handover period. Summarizing these statistics, one can conclude that low income households experienced the lowest income growth in the last twenty years while the rich households enjoyed the highest increase in income.

Changing Household Composition

The empirical evidences presented in this paper clearly shows that household income disparity widened in post-handover Hong Kong. Other than rising income disparity, what other household characteristics should the policy makers pay attention? Lui (2013) argues that the ageing population together with rising single person households was one of the major reasons to explain the widening household income distribution. Along this line of thought, we examine the changing household composition in post-handover Hong Kong.

Figure 1
Percentage Share by Household Size, 1997–2017



Source: Census and Statistics Department (2018c)

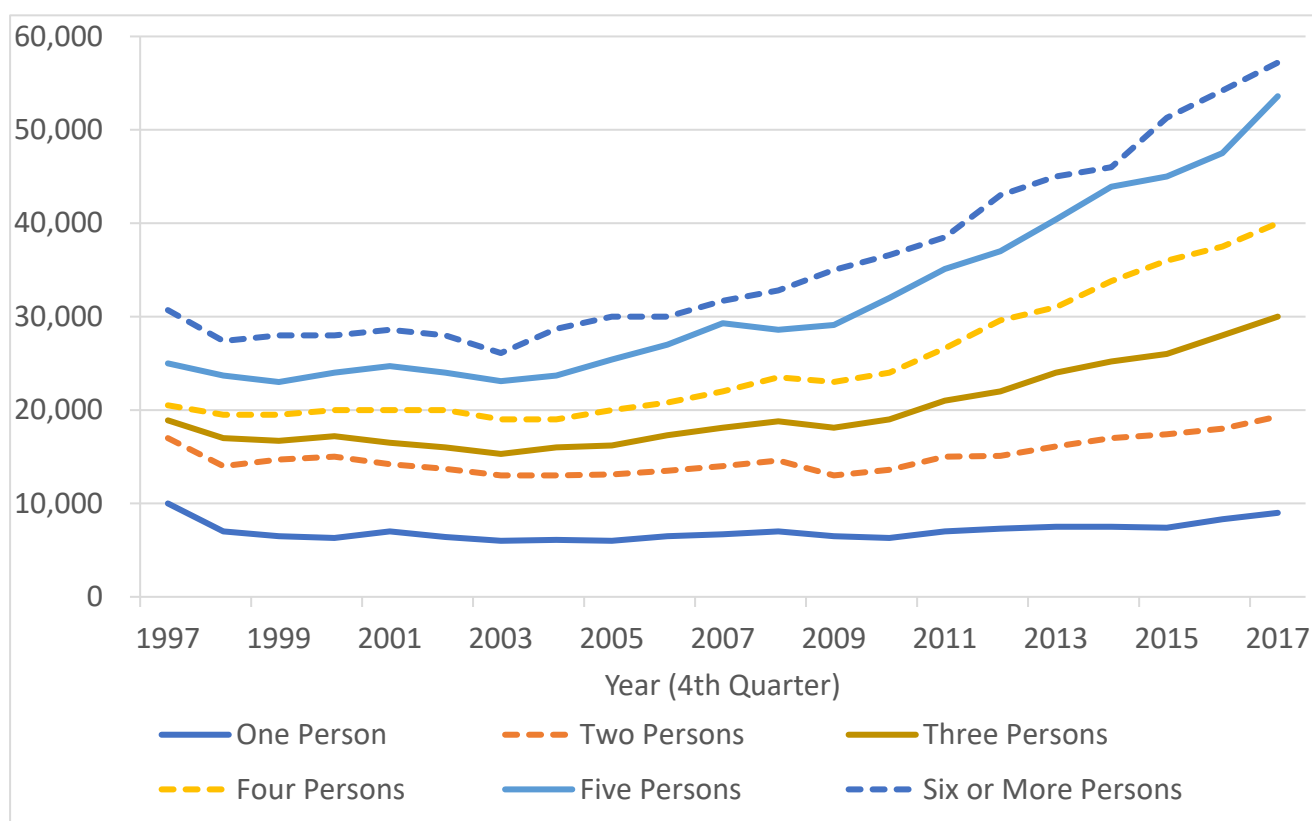
Since the handover, the number of households increased from 1,935,500 in the fourth quarter of 1997 to 2,540,500 in the fourth quarter of 2017, which represents an increase of 31.3 per cent (Census and Statistics Department 2018c). During the same period, the mid-year population estimates increased from 6,502,100 in 1997 to 7,389,500 in 2017, or an increase of 13.6 per cent (Census and Statistics Department 1998; 2017b). Combining these two sets of statistics, we can estimate that the average household size decreased from 3.36 persons per household in 1997 to 2.91 persons per household in 2017. Since China resume full sovereignty over Hong Kong, the average household size was shrinking continuously. A side effect of the shrinking household size is the ever-increasing demand for housing especially the demand for smaller living quarters. The policy makers should understand clearly that the increase in demand for living quarters will rise faster than the increase in population size.

Instead of studying the changes in average household size, we can examine the distribution by household size. Figure 1 depicts the percentage share of households by household size using the fourth quarter data, extracted from the latest Quarterly Report on General Household Survey (Census and Statistics Department 2018c), for the period from 1997 to 2017. Although official statistics divided the households by six household size groups, I combined the last two groups into one group as households with more than five persons are

less and less common in Hong Kong in the last two decades. From figure 1, we can observe a rising trend of small households with three persons or less while households with four or more members are declining.

In 1997, households with five or more persons accounted for over 21 per cent but this proportion dropped to 11 per cent in 2017. In the opposite extreme, there were just over 13 percent households with one person only in 1997 but their share rose to around 18 percent in 2017. Similarly, two-person households increased from around 20 per cent to around 28 per cent during the post-handover period. This changing household composition not only appeared in Hong Kong but also in many advanced economies. Such a trend is closely related to the low fertility rate among developed economies. The fertility rate in Hong Kong was kept declining in the past three decades and was among the lowest in the world (Census and Statistics Department 2015). For example, Statista (2016) estimated that the lowest fertility rate in the world was recorded in Singapore which was 0.82 children per woman, while Hong Kong ranked fourth with an estimated 1.19 children per woman.

Figure 2
Median Household Income (HK\$) by Size, 1997–2017



Source: Census and Statistics Department (2018c)

Figure 2 presents the median household income by household size over the period from 1997 to 2017 using the fourth quarter data extracted from the latest Quarterly Report on General Household Survey (Census and Statistics Department 2018c). All numbers are expressed in Hong Kong dollars at current market price. By comparing the gaps between the lines in 1997 and 2017, we can see that the nominal median household income gap widening substantially

between different household size groups in the post-handover Hong Kong. One striking feature of these trend lines is that the slope (or the income growth rate) is steeper for households with more members than those of smaller households. In other words, larger households could enjoy higher growth rate in median household income.

Single-person household, on the contrary, suffered the most as their median household income recorded a decrease not just in real terms but also in nominal terms. In the fourth quarter of 1997, the nominal median household income of single-person households was HK\$10,000 and it dropped to HK\$9,000 in the fourth quarter of 2017. I suspect that this unusual phenomenon maybe related to the increasing number of senior citizen living alone, who were not gainfully employed. It was widely reported in the media that many senior citizens solely rely on the comprehensive social security assistance to support their living. To answer this question, I make use of the five per cent random subsample of 1996 and 2016 Hong Kong Population By-Censuses to estimate the percentage share of single-person households with zero income. In 1996, the share of zero income singleton households stood at 0.7 per cent and the percentage share jumped to 7.2 per cent in 2016. Most of these zero-income one-persons households are retired elderly. In other words, the proportion of zero income singleton households in 2016 was ten times that of 1996. It explains the paradox that the nominal and real median household income was declining in the last two decades.

Table 3
Gini Coefficient by Household Size

Household Size	1996	2016
1	0.615	0.652
2	0.547	0.545
3	0.487	0.450
4	0.457	0.433
5+	0.482	0.486
Overall	0.518	0.539

Sources: Census and Statistics Department (1997, 2017a).

Although, Figure 2 suggests that the nominal income gap between different household size groups was increasing in the post-handover period, a more scientific way is to examine the changes in a reliable inequality measure. Table 3 presents the official Gini coefficient by household size for the period from 1996 to 2016. Two groups experienced a very small increase in income disparity while two others recorded a small improvement in distribution. The only household size group that experienced a noticeable worsening in income disparity was among single-person households. For singleton households, the Gini coefficient increased from 0.615 in 1996 to 0.652 in 2016. Bearing in mind, there were 7.2 per cent of them with zero household income in 2016 and such a high Gini coefficient should be somewhat expected.

Moreover, it should be noted that the Gini coefficients for single-person and two-person households were much higher than those of other household size groups and Figure 1 tells us that there were more and more households with one or two members. Even if these Gini

coefficients remained unchanged in the last twenty years, the changing household composition would also lead to higher income disparity.

Table 4
Variance of Log Household Income by Household Size

Household Size	1996	2016
1	1.408	1.325
2	1.122	1.000
3	0.591	0.603
4	0.516	0.555
5+	0.559	0.549
Overall	0.908	1.048

Source: Author's own tabulation from the five per cent random subsamples of 1996 and 2016 Hong Kong Population By-Censuses.

Table 5
**Decomposition of Change in Variance of Log Household Income
1996 – 2016**

Component	Change in Variance
Composition Change	0.0153 (11.0%)
Between Group	0.0563
Within Group	-0.0410
Change in Variance	0.1245 (89.0%)
Between Group	-0.0261
Within Group	0.1506
Overall Change	0.1399

Source: Author's own tabulation from the five per cent random subsamples of 1996 and 2016 Hong Kong Population By-Censuses.

In order to understand whether the changing household composition and/or income inequality within each household size group contribute to the rising income disparity, economists will employ decomposition analysis as explained in Juhn *et al.* (1991, see also Lui

2013)³. Table 4 presents the variance of log household income by household size using the random sub-samples of the two population by-censuses whereas Table 6 presents the results of the decomposition analysis.

Table 4 shows that one-person and two-person households had significant higher variation in log income than those of other groups and these results are consistent with the official Gini coefficients reported in Table 3. As explained earlier, the percentage share of one-person and two-person households are increasing in the last two decades. Higher variance in log household income coupled with higher percentage share in the post-handover Hong Kong, one should expect widening household income inequality, *ceteris paribus*.

Table 6 presents the result of the decomposition analysis which confirmed that household composition change explained 11 per cent of the increase in variance of log household income. On the other hand, income disparity between household size groups explained the remaining 89 per cent of the rising variance in log household income. With ageing population and ever decreasing household size, the percentage shares of singleton person and two-person households will keep increasing in the foreseeable future in Hong Kong. This trend will inevitably lead to widening household income disparity. Moreover, the number of zero-income one-person households is increasing at a rapid pace, the demand for social security will pose a serious financial burden to the government. Policy makers should investigate these problems immediately before it becomes a social time bomb.

3. CONCLUSIONS AND DIRECTIONS OF FUTURE RESEARCH

Although two catastrophic events swept through Hong Kong, i.e. Asian Financial Tsunami (1998-1999) and Severe Acute Respiratory Syndrome (2001-2003), the economy only experienced negative GDP growth for two years in the post-handover period. Behind this remarkable economic success, not every worker or every household could reap the benefit from the economic growth. The empirical evidences presented in this paper point out that household income disparity has widened continuously in the last twenty years. Some of the more important findings are:

1. Rising household income disparity with Gini coefficient increased from 0.518 in 1996 to 0.539 in 2016.
2. One-person and two-person households have higher income dispersion than those of other household size groups.
3. The percentage share of one-person and two-person households are ever increasing.
4. The percentage share of zero-income one-person household is increasing rapidly.
5. Composition change alone explained 11 per cent of the rising income disparity.
6. Policy makers need to investigate the consequences of the ageing population and rising zero income households before these develop into social time bombs.

Due to data limitations, this paper cannot examine the wealth status or asset position of individual households. Since most people in Hong Kong lack retirement planning and the contribution to the mandatory provident fund is far from adequate to support a decent retirement life, the policy makers need a comprehensive review of its policy in dealing with ageing. Suppose many of the zero-income one-person households have rich endowment, the resulting demand for financial support from the government can be reduced. Moreover, inter-

³ One drawback of this decomposition analysis is that zero income, after taking log, will be removed from the analysis. Therefore, readers should read the decomposition analysis results with care.

generation income transfer is not covered by the population census and we need more data to investigate the situation.

Lastly, this paper only examines the income disparity issue and does not touch upon other economic and social issues spin off from widening income distribution. For example, the increasing number of one-person and two-person households will increase the demand for smaller living quarters. This in turns will lead to higher demand for land to build housing. Furthermore, Hong Kong's fertility rate is among the lowest in the world and this will translate into high dependency ratio in the near future. In short, this paper raises a lot more questions than the questions it addressed.

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