ORIGINAL ARTICLE

A decomposition analysis to examine the change in the number of recipients in the comprehensive social security assistance (CSSA) system

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Abstract

Social security is an important social and public policy measure to help address poverty in any contemporary society. The Comprehensive Social Security Assistance (CSSA) system in Hong Kong provides a safety net for those aged children and adults below 65 years old who cannot support themselves financially. It is designed to bring their income up to a prescribed level to meet their basic needs. The rapid increase in social welfare expenditure in the last decade has become a concern to the Hong Kong SAR Government. The overall social welfare expenditure has accounted for nearly 15.6% of government expenditure in 2018, with the total amount increasing from $58 billion to $90 billion (an increase of 72.4%) for the period 2014-2018. However, the amount spent on CSSA only increased from $20.7 billion to $22.3 billion with an increase of 7.7% only for the same period. The much slower magnitude of increase is related to the reduction in the number of CSSA recipients, which decreased from 237,501 to 185,528 over the period. A decomposition method was used to assess the changes in the number of people in the CSSA system. It showed that the rate of arriving into the system has been decreasing due to a robust economy with a very low unemployment rate; whereas moving out of the system has also been decreasing in the past 5 years. This phenomenon can be partly attributed to the widening of the income gap in the community in the period. Despite the increase in population size, as long as employment conditions remain strong and the momentum of leaving the system can be maintained, the number of CSSA recipients will continue to decrease. However, the results also suggested that a certain proportion of CSSA recipients will not be able to move out of the system and have been trapped. Some innovative methods to help them out of CSSA are discussed. In view of the poor economic outlook arising from the COVID-19 pandemic, it is important for the Government to have effective measures to keep people in their jobs. If the unemployment rate will does not substantially increase and then increase of in CSSA recipients can be contained.

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1 Introduction

Social security is an important social and public policy measure in any contemporary society. It is designed to bring low-income groups up to a prescribed level to meet their basic needs such that affected individuals and households can have some relief and reposition themselves for the next stages of life. It is particularly relevant to the key global concern of helping those who are unable to support themselves. "Leave no one behind" is the slogan adopted by the United Nations' 2030 Sustainable Development Goals (United Nations 2016), and ending poverty, everywhere, in all its forms, is the first of the Sustainable Development Goals (SDG).

There were 1.4 million people living below the poverty line in Hong Kong in 2018, accounting for 20.1% of the total population of 7.0 million, (Poverty Report 2018). Researchers have argued that poverty can be alleviated by social security through redistributing resources towards the poor (Jones 1981; Midgley 1984), and local statistics prove that social security can make a significant difference to Hong Kong's poverty situation (Poverty Report 2018). For Hong Kong, after accounting for government recurrent cash benefits (including various kinds of social security schemes including CSSA), the size of the poor population was reduced from 1.4 million to just over 1 million (14.7% of the population)—a 28% reduction in the size of the poverty population. Hong Kong's social service expenditure accounted for more than 15.6% of Hong Kong government expenditure, equal to about $90 billion, and it increased by 72.4% for the period 2014–2018 whereas the expenditure on CSSA only increased by 7.7% from $20.7 billion to $22.3 billion for the same period. On the other hand, the non-means tested Social Security Allowance (SSA) Scheme for older adults aged 65 or over increased by 111.3% from $18.6 billion to $39.3 billion, which is a worrying economic sign for a rapidly ageing society.

Reducing the number of dependents in the social security system and maintaining a dynamic and vibrant economically active population is a high priority concern for policy makers of any government. A good understanding of the movement in and out of the social security system will be helpful in formulating effective interventions to reduce the number of social security recipients and to ensure financial sustainability of the system.

Yip et al. (2020) proposed a stochastic model to examine the in- and out- movement in the CSSA scheme and identified that the group aged 30–49 with children had the largest impact on the number in the system. The results suggested that preventing this group from entering the CSSA system would be more effective in reducing the number of CSSA recipients than policies that aim to help them exit. It is a good illustration of the Rose Theorem, which asserts that the impact of "reducing a small risk in a large population" is more effective than "reducing a high risk in a small population" (Rose 1992; Yip et al. 2014). On the other hand, intergenerational poverty is of particular concern to policy makers (Peng et al. 2019). It is of great concern for helping those people who are trapped in poverty. Upward mobility

seems to be stagnant and poverty has become a structural problem in the community, especially among ethnic minorities (Poverty Report 2018).

In this study, we adopt a decomposition analysis to assess the impact of population growth and age structure on the numbers of people moving in and out of the CSSA scheme for the period 2014–2018. It is an improvement on earlier work that did not take into account the moving in and out mechanisms (Yip et al. 2016). Here, the proposed method disentangles the overall effect of the changes in number of people in the CSSA scheme at two different time points from the effect of demographic transition size and age structure.

2 Scheme, data and method

2.1 CSSA Scheme

Hong Kong has a minimalist social welfare support system as compared to other western countries. The Government promotes self-reliance, and the Hong Kong people are also not used to relying on handouts by the Government. The amount of assistance under the CSSA scheme is determined by the monthly income and recognised needs of a household. The difference between the total assessable monthly income of a household and its total monthly needs as recognised under the CSSA scheme in terms of various types of payment will be the amount of assistance payable. When assessing a household's monthly income, earnings from employment and training/retraining allowance can be disregarded up to a prescribed level so as to provide an incentive to work and to recognise the additional expenditure incurred in attending training/retraining courses. The applicant must fulfil the residence requirement and pass both the income and asset tests. Persons aged 15–59 in normal health should actively seek full-time jobs and participate in the Support for Self-reliance Scheme (SFS) of the Social Welfare Department (SWD) if they are unemployed or working part-time or earning less than a reasonable wage as defined by SWD. The CSSA payments can be broadly classified into three types, namely, (a) standard rates; (b) supplements; and (c) special grants. Under the CSSA scheme, different standard rates are applicable to different categories of recipients. In addition, the CSSA scheme provides various supplements to specified recipients, such as elderly persons, persons with disabilities or in ill-health, single parents and able-bodied adult recipients aged 60 to 64. A wide range of non-standard payments in the form of special grants are also payable to meet expenses such as rent, school fees and other educational expenses, and medically recommended diets/rehabilitation/hygienic items. Details can be seen at https://www.swd.gov.hk/en/index/site_pubsvc/page_socsecu/sub_comprehens/.

2.2 Data

The Social Welfare Department has provided the number of CSSA recipients by age group as of the end of 2014 and 2018, and the number of CSSA recipients with

duration on CSSA of less than 1 year by age group. These allow us to estimate the number of arrivals to and removals from the CSSA system (see Table 1). The data excluded the 400,000 foreign domestic helpers who are not entitled to receive CSSA. The dataset was categorized into CSSA-arrival and CSSA-removal, and by age group. In this study, we used 13 age group categories (0–4, 5–9, 10–14, 15–19, 20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64). For those who aged over 65, a different scheme named Social Security Allowance (SSA) is available. The objective of the SSA scheme is to provide a monthly allowance to Hong Kong residents who are severely disabled or who are 65 years old or above to meet special needs arising from disability or old age. The SSA scheme participants are not required to go through a means test. Hence, the mobility out of the SSA scheme is non-existent as it is really a

Table 1 Changes in the number of arrivals and removals, total number of CSSA and non-CSSA populations, arrival and removal rates, and the decomposition of the changes in age (Q1, Q2), size (P1, P2) and rate (R1, R2) effects in the period 2014–2018

	Arrival size	Arrival rate	Non-CSSA size	Removal size	Removal rate	CSSA size
2014	21730	0.37%	5925699	34847	15.05%	231501
2015	20667	0.35%	5945016	34224	15.67%	218384
2016	20003	0.33%	5979573	30204	14.75%	204827
2017	19049	0.32%	5972674	28147	14.46%	194626
2018	17846	0.30%	5999272	26367	14.21%	185528
Change (i.e. 2018s minus 2014s)	− 3884	− 0.07%	73 573	− 8480	− 0.84%	− 45 973

Decompose the changes into effects	Age	Arrival size	Arrival rate effect (R1)	Age effect (Q1)	Non-CSSA size effect (P1)	Removal size	Removal rate effect (R2)	Age effect (Q2)	CSSA size effect (P2)
	0–4	− 803	− 906	68	36	− 643	92	34	− 770
	5–9	− 379	− 670	266	25	− 718	− 83	2	− 637
	10–14	− 193	− 322	109	20	− 888	− 255	26	− 659
	15–19	− 331	− 76	− 268	13	− 1 713	− 688	− 439	− 585
	20–24	− 156	− 134	− 27	5	− 489	− 177	− 135	− 177
	25–29	− 194	− 167	− 36	9	− 240	− 57	29	− 211
	30–34	− 353	− 319	− 48	15	− 516	− 125	− 48	− 343
	35–39	− 486	− 639	133	20	− 802	− 193	− 75	− 534
	40–44	− 565	− 537	− 48	20	− 553	212	− 144	− 620
	45–49	− 158	− 173	− 2	17	− 899	− 510	86	− 474
	50–54	− 283	− 128	− 172	18	− 715	− 93	− 111	− 511
	55–59	− 102	− 237	115	20	− 735	− 346	126	− 515
	60–64	119	− 353	44	28	431	600	510	− 679
	Total	− 884	− 4662	533	245	− 8480	− 1624	− 140	− 6716

welfare payment for older adults depending on their needs and it is also non-contributory. Hence, in this paper we only examine the movement of the CSSA recipients of the group of aged 0–64 only. Stratified data for the two time points 2014 and 2018 were then used to conduct the decomposition analysis. The CSSA scheme in Hong Kong provides a safety net for those who cannot support themselves financially. It is designed to bring their income up to a prescribed level to meet their basic needs. The applicant must pass both the income and asset tests. The CSSA cases of young people aged 18 or below is usually based on their parents/guardians. Not all household members are eligible as each member needs to satisfy the criteria on income level and residence right.

2.3 Method

2.3.1 Notation

k Age group;

t Year: equals 1 for 2014 and 2 for 2018;

A_{kt} number of CSSA arrival population within group k in year t

$A_{.t}$ number of CSSA arrival population in year $t \left(= \sum_k A_{kt}\right)$

R_{kt} number of CSSA removal population within group k in year t

$R_{.t}$ number of CSSA removal population in year $t \left(= \sum_k R_{kt}\right)$

X_{kt} number of non-CSSA population within group k in year t

$X_{.t}$ number of non-CSSA population in year $t \left(= \sum_k X_{kt}\right)$

Y_{kt} number of CSSA population within group k in year t

$Y_{.t}$ number of CSSA population in year $t \left(= \sum_k Y_{kt}\right)$

p_{kt} arrival rate of non-CSSA population within group k in year t

q_{kt} removal rate of CSSA population within group k in year t

N_{kt} net change in number of CSSA population within group k in year $t \left(A_{kt} - R_{kt}\right)$

$N_{.t}$ net change in number of CSSA population in year $t \left(= \sum_k \left(A_{kt} - R_{kt}\right)\right)$

2.4 The decomposition formula

The number of new arrivals and removals in year t can be expressed as the product of three components summing across age-size groups as in (2) and (4) respectively:

$$A_{.t} = \sum_k p_{kt} X_{kt} \tag{1}$$

$$= \sum_k p_{kt} \frac{X_{kt}}{X_{.t}} X_{.t} \tag{2}$$

$$R_{.t} = \sum_k q_{kt} Y_{kt} \tag{3}$$

$$= \sum_k q_{kt} \frac{Y_{kt}}{Y_{.t}} Y_{.t} \tag{4}$$

In Eq. (2), the first component (p_{kt}) refers to the age-specific arrival rate effect ($R1$), which measures the arrival rate within age group k. The overall arrival rate is the sum of the specific arrival rates in the year. The second component ($\frac{X_{kt}}{X_{.t}}$) refers to the age-specific effect ($Q1$), which measures the ratio of the kth age group with respect to the non-CSSA population size. The third component ($X_{.t}$) refers to the non-CSSA population size effect ($P1$).

Similarly, Eq. (4) specifies the age-specific removal rate (q_{kt}) effect ($R2$), age-specific ($\frac{Y_{kt}}{Y_{.t}}$) effect ($Q2$), CSSA population size ($Y_{.t}$) effect ($P2$).

Equations (2) and (4) are the product of the three components. The Kitagawa's decomposition (Kitagawa 1955) was used to differentiate the relative contributions of $R1$ and $Q1$ and $P1$, $R2$ and $Q2$ and $P2$ effects from the change in overall newly arrival and removal population for the two time periods, respectively.

$$\text{The age composition effect non - CSSA: } Q1 \text{ effect} = \sum_k \frac{X_{.2} + X_{.1}}{2} \frac{p_{k2} + p_{k1}}{2} \left(\frac{X_{k2}}{X_{.2}} - \frac{X_{k1}}{X_{.1}} \right)$$

$$\text{The age composition effect CSSA: } Q2 \text{ effect} = \sum_k \frac{Y_{.2} + Y_{.1}}{2} \frac{q_{k2} + q_{k1}}{2} \left(\frac{Y_{k2}}{Y_{.2}} - \frac{Y_{k1}}{Y_{.1}} \right)$$

$$\text{The non - CSSA population size effect : } P1 \text{ effect} = \sum_k \frac{p_{k2} + p_{k1}}{2} \frac{\frac{X_{k2}}{X_{.2}} + \frac{X_{k1}}{X_{.1}}}{2} \left(X_{.2} - X_{.1} \right)$$

$$\text{The CSSA population size effect: } P2 \text{ effect} = \sum_k \frac{q_{k2} + q_{k1}}{2} \frac{\frac{Y_{k2}}{Y_{.2}} + \frac{Y_{k1}}{Y_{.1}}}{2} \left(Y_{.2} - Y_{.1} \right)$$

With reference to Eqs. (1) and (3), they are the product of two components. The decomposition can be simplified as below:

$$\text{The arrival rate to CSSA effect: } R1 \text{ effect} = \sum_k \frac{X_{k2} + X_{k1}}{2} \left(p_{k2} - p_{k1} \right)$$

$$\text{The removal rate from CSSA effect: } R2 \text{ effect} = \sum_k \frac{Y_{k2} + Y_{k1}}{2} \left(q_{k2} - q_{k1} \right)$$

The R, Q and P effects sum up to give the change in the arrival number and removal number, thus giving the rate of change of CSSA population size.

$$\text{Change of } A. = A_{.2} - A_{.1} = R1 \text{ effect} + Q1 \text{ effect} + P1 \text{effect}$$

$$\text{Change of } R. = R_{.2} - R_{.1} = R2 \text{ effect} + Q2 \text{ effect} + P2 \text{ effect}$$

We take the arrival size as the sign of the net change, i.e. net arrival. As removal size effect contributes a negative impact on arrival size effect, we can calculate the net change (arrival) size at time t from

$$N_{.t} = A_{.t} - R_{.t}$$

We can further calculate the difference between two different time points, i.e. change of net arrival size, from

$$\text{Change of } N. = N_{.2} - N_{.1} = \left(A_{.2} - R_{.2}\right) - \left(A_{.1} - R_{.1}\right)$$
$$= \left(A_{.2} - A_{.1}\right) - \left(R_{.2} - R_{.1}\right) \tag{5}$$

3 Results

3.1 Population and CSSA dynamics

Table 1 gives the changes in arrival and removal sizes, total CSSA and non-CSSA sizes, arrival and removal rates, and the decomposition of the changes (2018 minus 2014) into age ($Q1$, $Q2$), size ($P1$, $P2$) and rate ($R1$, $R2$) effects over the period 2014–2018 by 5-year age group. It showed a healthy sign that the number of people remaining in CSSA has been continuously decreasing monotonically from 231,501 in 2014 to 185,528 in 2018, with 45,973 having left the CSSA scheme for the whole period. The changes in the number of arrivals and removals in 2014–2018 were 3884 and 8480, respectively. Both the arrival and removal rates have been decreasing, with the arrival rate reducing from 0.37 to 0.30%, and the rate of leaving reducing from 15.05 to 14.21%. Thus, while fewer are entering the CSSA system, there has also been a reduction.in the number of removals from CSSA.

Table 1 suggests that increases in the population size for the period 2014–2018 resulted in an increase of 245 people into the CSSA scheme. While the age effect also contributed 533 people to CSSA as older people had a higher rate in joining the scheme. On the other hand, the improvement in the arrival rate contributed to a reduction of the number of CSSA recipients (-4662). The positive effect in containing the growth in CSSA recipients is offset by the increase from the population growth ($+245$) and ageing of the non-CSSA population ($+533$), with a net reduction -3884 for the period 2014–2018.

For the removal, decreases in the size of the CSSA population accounted for the majority of the reduction of the number of removals, with a difference of -6716 between 2014 and 2018, and the effect of ageing also slowing down the number of removals by -140. More importantly, the reduction of removal rate between 2014 and 2018 contributed negatively to the number of removals (-1624). The age group of 15–19 had the highest reduction of removal from the CSSA, which might relate to the recent increase in youth unemployment (especially those who are not in school and unskilled) in Hong Kong.

The negative sign suggest a stagnation of the CSSA recipients in the system. However, there was a notable positive contribution made by improvements in employment among older adults aged 60–64 leaving the CSSA system (+600).

Figure 1 depicts the size of age specific movement of CSSA recipients in and out of the system for the period 2014–2018, with the size determined by the rate and associated population size. For the arrivals, there has been a consistent improvement in the reduction of CSSA recipients for all age groups except for a slight increase among older adults (+119). However, as the ageing effect has become more significant than before, the size of the arrival for the age group 60–64 is still positive compared to 2014, as the improvement in its rate has completely been offset by the ageing effect despite improvements in preventing older adults from entering into the CSSA system. For the removal, all of the age groups have experienced a reduction of removal rate of leaving the CSSA system except for the age group 60–64. The reduction of the removal rate is worrying, as it indicates that nearly all of the CSSA population found it harder to remove themselves from being a CSSA recipient in 2018 compared to 2014. The increase in the number of removals in the 60–64 age group is noteworthy. This can be attributed to significant improvements in rehiring older adults into the workforce. The working participating rate among older adults in the period has improved due to incentivization and increases in job opportunities for the older population (Table 2).

4 Discussion

The decomposition analysis allows us to examine the impact on the number of CSSA recipients of changes in arrival and removal, population size and age distribution. It showed that the number of Hong Kong's CSSA recipients has been decreasing for the period 2014–2018, mainly due to changes in the number of removals (277%) and arrivals (−177%). The robust economy with a very low unemployment rate (3.0%) in Hong Kong helped to reduce the chance of becoming a CSSA recipient from 0.37 to 0.30% during 2014–2018. On the other hand, the rate of removals decreased from 15.0 to 14.2%, indicating that it is more difficult than before to leave the CSSA system.

It has been shown that having a job is the most effective way to stay out of the CSSA system (Poverty Report 2018). The Government has tried to improve the incentive for low-skilled workers to join the work force by introducing the Transport Subsidy Scheme in 2017, covering 25% of fares beyond HK$400 per month. With a threshold of HK$6500 income per month, within which applicants must fall, the scheme has excluded a large percentage of low-income workers with earnings just above the threshold that are struggling to have a reasonable quality of life. (Sha et al. 2018)

Improving employment opportunities for older adults (aged 60–64) is important in keeping them out of CSSA, therefore it is encouraging to see (as shown in Table 1) that more people in this age group are keeping their work and/or getting a job such that they do not have to rely on the CSSA system. Some members wish to work and have the ability to work beyond their retirement age. The usual retirement
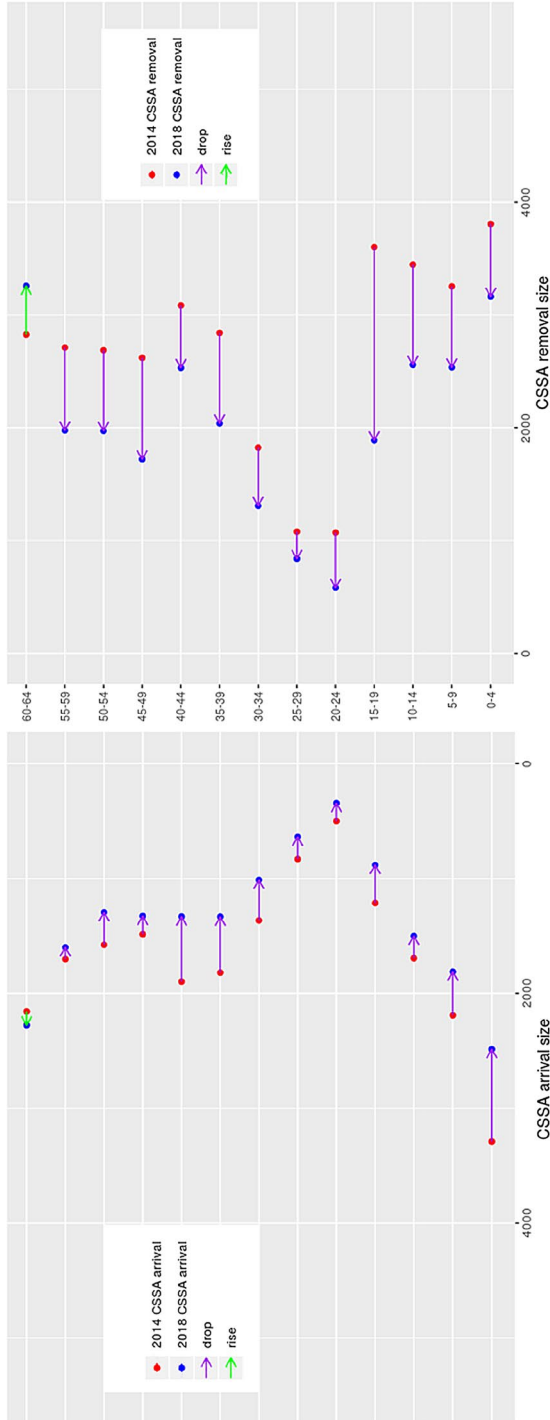
Fig. 1 Changes in the number of arrivals and removals between 2014 and 2018 by five-year age group

Table 2 Decomposition of net arrival sizes of CSSA recipients (i.e. arrival size minus removal size), 2014–2018

Year	Net arrival size	Arrival size	proportion of arrival	Removal size	proportion of removal
2014	− 13117	21730	− 166%	34847	266%
2015	− 13557	20667	− 152%	34224	252%
2016	− 10201	20003	− 196%	30204	296%
2017	− 9098	19049	− 209%	28147	309%
Total	− 45973	81449	− 177%	127,422	277%

age in Hong Kong workforce is 60 years whereas the Hong Kong life expectancy has increased to 84 years old (C&SD 2020). Removing barriers to working at older age would be a win–win scenario, especially in view of the shortage of workers due to Hong Kong's ageing society. Some of the major barriers to retaining older adults in the workforce are the complicated procedures and expensive medical insurance, which is a major concern of many companies employing older adults (Encouraging Young-Olds Employment 2018). Some infrastructure support and more flexible arrangements in the working environment would be conducive to increasing the working participation rate among older adults.

For the removal rate, the propensity of leaving continues to decrease, reducing the number of removals and the number of CSSA recipients remains high. Apparently, inertia has been building in our system such that some people cannot move out from CSSA. They are trapped in the system, or they have become the structural poor. For example, in view of the rising divorce rate in Hong Kong, single parents with young children that are lacking support from their families are particularly affected. Without sufficient childcare service, the women would have more difficulty to participate in the workforce. Furthermore, children from CSSA families have been shown to have lower self-esteem (Yip 2020). To avoid issues of structural and stubborn poverty, we need to provide training and retraining programs for those who still have the ability to re-join the workforce. More family friendly working environments would be helpful to increase female labour participation to break down intergenerational poverty.

Another vulnerable group, the 150 migrants daily from Mainland China might have an impact on the increase in the number of CSSA recipients. However, in reality most of them do not resort to seeking support from the CSSA (Lee and Chou 2018). Nevertheless, more effort should be made to engage Mainland migrants successfully to remove barriers to their workforce participation. Also, these migrants are mainly the spouses and children of Hong Kong residents, with socioeconomic profiles generally inferior to local residents. They often experience problems in finding jobs due to lack of skills, qualifications and the language barrier (Government of Hong Kong Special Administrative Region 2013). The new female migrants also have to look after young children. The insufficient child care support has made it difficult for the female migrants to participate in the work force which can create sort of structural financial dependence (Yip 2020). Some poverty among new migrants also

relates to the lack of recognition in Hong Kong of qualifications earned in Mainland China, and this may constitute a waste of human capital (Chou et al. 2014). The specific poverty rates in the groups of old age and large households are higher than the population average (Lee and Chou 2016).

Also, it is a good time to re-examine the wage especially for the low skilled workers and outsourcing arrangement of the Government services. Sometimes, the working wage is so low that it discourages people looking for work. The low wage is indeed a complicated issue which depends on the supply and demand of the workforce. Nevertheless, coupled with low wages, unfair treatment by some employers, limited amount of protection of the labour law, and extreme profit-seeking behaviour by outsourcing companies, these workers can find themselves unable to improve their quality of living through regular employment, and have to work overtime in order to satisfy their basic needs, at the expense of their own and family well-being and society's welfare. Sometimes, they don't have a choice but by becoming a CSSA recipient.

5 Limitations

The paper has examined the impact of the demographic transition on the number of CSSA recipients. Indeed, the CSSA recipients also depends on the household structure and changes for the period 2014–2018. Unfortunately, the CSSA household data is not available for analysis. Nevertheless, Individuals under 18 would not be eligible to apply for CSSA. Hence, all the CSSA recipients under 18 years old should be dependent of the adults recipients. Changes in the age group 30–45 would be closely related to the number of recipients of aged 0–4.

6 Conclusions

Access to social security is a lifeline for the vulnerable groups in the community, and forms the major expenditure component of social welfare spending in Hong Kong. Being employed is the most effective way to stay out of the CSSA (Poverty Report 2018). The economy has been strong despite the relatively low working wage. The majority of recipients would not apply for the CSSA if there is other alternatives. Nevertheless, our economy remains outward-oriented and more than 87% (Poverty Report 2018) of our workforce (3.4 million out of 3.9 million) is employed in service industries. With the COVID-19 pandemic and the drastic reduction of international and mainland tourism, the impact on the economy is yet to be fully revealed. Due to the poor global economic outlook, unemployment is going to be increasing at an alarming rate, which will certainly have a negative impact on the number of CSSA recipients. Unfortunately, in the last few years the propensity to leave CSSA is decreasing, creating an increased proportion of individuals being kept in CSSA. Hence, CSSA has become somewhat of an ineffective crutch for these individuals, and the reliance on aid that is only intended to be transitional continues to leave a large proportion of beneficiaries feeling defeated and morally degraded (Yip et al.

2020). It is crucial to help those who are working to stay in work, otherwise even a small percentage change to the large overall working population will have a substantial impact on the number of CSSA recipients. At the same time, by providing a reasonable wage it will also be able to retain/attract more people to joining the work force.

Compliance with ethical standards

Conflict of interest The authors declared there is no conflict of interest.

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