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Social pension reform and poverty among older people in Hong Kong: Triple difference estimations

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ABSTRACT

Research calls for evidence from a strict experiment-based design to illustrate the effect of a social pension expansion on mitigating poverty among older adults in non-welfare regimes. This study utilized the introduction of a new higher tier of the Old Age Living Allowance (OALA) in Hong Kong in June 2018 as its experimental condition. It examined the impact of the higher OALA on economic activity, financial transfers from non-co-resident adult children, household income, household expenditure, income-based poverty, and expenditure-based poverty among Hong Kong's older adults. Supported by three waves of data collected in 2015, 2017, and 2019 from a sample, we designed a quasi-experiment and estimated the triple differences in the six outcome variables. The findings show that the higher OALA impacted the institutionalized life course by reducing financial transfers from non-co-resident adult children and significantly increased income-based and expenditure-based poverty. Findings reveal the crowding-out effect of the higher OALA and motivate a discussion of the nature of reduced financial transfers from non-co-resident adult children among older adults in Hong Kong.

As basic financial support provided to older adults, which is fully funded by government tax revenue, the social pension has gained prevalence in both developed and developing countries (Pal & Palacios, 2011; Posel et al., 2006; Queiroz, 2017; Reynaud, 2000). Increased attention has been given to the role of the social pension in affecting the prevalence of poverty among older people (Been et al., 2017; Ebbinghaus, 2021; Ferreira, 2006; Pal & Palacios, 2011).

Poverty is understood as a multidimensional construct. The income-based and expenditure-based poverty are the two most prevalent poverty indicators in old age (Cheung & Chou, 2019; Heflin et al., 2009; Kuypers & Marx, 2018; Nolan & Whelan, 2011). Household income plays a central role, and having a predictable and reliable source of revenue will significantly impact the expenditure and quality of life of older recipients (Kim et al., 2016; Lee & Chou, 2019; Wu & Li, 2014).

The policy goal for social pensions is to increase household income and reduce the prevalence of income-based poverty; however, this can be achieved only when the implementation of social pensions does not affect the institutionalized life course of older adults. The life-course theory proposes that a standard life course is composed of the decontextualized key stages of schooling, marriage, work and retirement (Elder et al., 2003; Riley, 1987). The role played by the government is to institutionalize the life course through social policies, such as mandating the age range for schooling, the age range for labor participation and the minimum age for retirement (Henretta, 1994). The critical point is that the social pension, as social policy, has the potential to halt or reverse the institutionalized life course (Chou & Chow, 2005). Receiving a social pension can potentially cause a 'crowding out' effect, where older people quit employment once they become social pension recipients, or whereby non-co-resident adult children reduce intergenerational financial transfers to their older parents when the latter start receiving a social pension (Kaushal, 2014; Ning et al., 2016; Gerardi & Tsai, 2014). Once a social pension impacts the institutionalized life course by activating the crowding out effect, we may not observe the anticipated increased income and reduced prevalence of income-based poverty among older households. When the crowding-out effect occurs, social pension expansion leads to the redistribution of financial resources between the older and younger population rather than building older adults' financial security and improving their quality of life (Lee & Lee, 2009).

Previous empirical findings generally suggest generous social

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pensions in welfare regimes are likely to cause crowding-out effects while reporting the ambiguous findings for non-generous social pensions in non-welfare regimes (Kaushal, 2014; Ning et al., 2016, 2019; Taniguchi & Kaufman, 2017). A generous social pension is generally defined as a benefit provision with a high replacement rate (i.e., the percentage of one's monthly employment income that is replaced by retirement income when he/she retires). The ambiguous findings in various non-welfare regimes likely result from different "perceived" generosity of social pensions. The ambiguity is particularly likely to occur when a non-welfare regime expands its social pension scheme by substantially increasing its recipient's benefit. That is why recent literature strongly calls for strict experiment-based evaluations to investigate the effectiveness of the expansion of social pensions in non-welfare regimes (Pal & Palacios, 2011; Peng, Wang, Zhu, & Zeng, 2023; Queiroz, 2017).

In mid-2018, Hong Kong Government reformed the social pension scheme by introducing a new higher tier of the old age living allowance (the higher OALA, whose benefit is 50% higher than the original OALA). On the one side, the significant increase in benefits is an important policy move in Hong Kong, which has been recognized as having a laissez-faire economy in which social welfare policy tends to be conservative. Recipients and their non-co-resident adult children are likely to perceive the higher OALA as generous when adopting the ordinary OALA as the benchmark for comparison. On the other side, the higher OALA may be perceived as not generous, reflected by its low replacement rate of around 19.6% of median monthly income (median monthly personal income in Hong Kong in 2018 = HKD 17,500), compared to an average of 63% in OECD countries (Airey & Jandrić, 2020; Hong Kong in Figures 2018). Thus, there is a strong motivation for us to examine how older recipients and their non-co-resident adult children respond to the higher OALA by changing the decision of labor participation and how their non-co-resident adult children respond by adjusting financial support to older parents. This current research adopted a quasi-experimental design to evaluate whether introducing the new higher tier of OALA had triggered the crowding-out effect among Hong Kong's older residents by using a sample of three-wave longitudinal observations and a triple difference estimation design. Our final purpose was to assess how the higher OALA had impacted income-based and expenditure-based poverty. Our assessment generates implications for commenting on the effectiveness of the higher OALA in Hong Kong and advising policymakers on future directions of social pension reform in both Hong Kong and other non-welfare regimes.

The rest of the paper was organized as follows. In the Literature Review, we introduced social pensions in Hong Kong, presented the details of key social pension reforms, and reviewed the dynamics between a social pension and the institutionalized life course of older people in Hong Kong. In the Methods section, we detailed the sampling framework, the sample, the measurement and the design of the triple difference estimation. The results of the triple difference estimation were reported and discussed to arrive at theoretical and policy implications.

1. Literature review

1.1. Social pension development in Hong Kong

In common with the other developed economies, the population of Hong Kong is experiencing rapid ageing. The projected results released by the Census and Statistics Department (CSD) in 2016 reveal that older adults, aged 65 or above, will make up 36.6% of the population by 2066 (Wong & Yeung, 2019). With the poverty line set as half the median household income (Lau et al., 2015), adjusted by household size, 32.6% of Hong Kong's population aged 65 or above, fell below the poverty line in 2012 (Hong Kong Council of Social Service 2013a, Hong Kong Council of Social Service, 2013b). The income-based household poverty rate for those over 65 fluctuated around 44.5% between 2009 and 2018, which was 14% higher than the poverty rate for those aged 18–64 (Census and Statistics Department 2019). The prevalence of poverty among females in the whole population (8.2%) was slightly higher than that among males (7.6%), as more than half of the older adults, aged over 65, were female (52.8%), and female older adults were more likely to live in economically inactive households (Office of the Government Economist, 2021).

Hong Kong relies on a large contributory retirement scheme, namely the Mandatory Provident Fund (MPF), and several non-contributory welfare schemes (i.e. social pension schemes) to build an income safety net for its older inhabitants. The MPF was introduced in 2000 and is a formal employment-based scheme that requires both employees and employers to contribute 5% of the monthly salary to the individual's account to prepare for retirement. Individuals with a monthly income of less than HKD 7,100 do not need to contribute, and economically inactive people are not covered (Chou et al., 2014). By March 2021, 3.72 million people in the labor force of the Hong Kong market were included in the MPF (MPF Schemes Authority, 2021). However, the effect of the MPF is limited for those who retired during the last decade, or who will retire in the coming decade, due to the inadequate amounts accumulated in the individuals' accounts. The MPF scheme has also been criticized for its high administrative fees, low voluntary contribution rates and unsatisfying investment performance, none of which can be addressed in the short term (Leung, 2017). The Hong Kong government was therefore motivated to strengthen its non-contributory schemes, namely, the social pension schemes, to alleviate poverty among its older population.

Social pension schemes in Hong Kong are constructed around three pillars: 1) the ordinary OALA, which is means-tested and targets those aged 65 or above; 2) Comprehensive Social Security Assistance (CSSA), which is also means-tested but is associated with stricter household assets and income limits and provides a higher level of benefit; and 3) the Old Age Allowance (OAA), which is provided for any older person, aged 70 and above, but provides the lowest allowance. Older people are allowed to engage in only one of these schemes. Taking 2013 as an example, eligibility and benefit levels for the three schemes are presented in Table 1. In the financial year 2014–2015, the proportion of the aged population benefiting from OALA (40%) was much higher than that for CSSA (16%) or OAA (23%). Reforms were introduced to the CSSA and OALA in 2017, and again in 2018, which systematically strengthened the whole social pension scheme. In February 2017, the government removed a regulation from the CSSA that required older people not living with their children to submit a 'bad son statement,' which was a declaration that adult children were not providing financial support to their parents (see Table 1). This reform aimed to remove personal stigma and social stigmatization from the policy and to motivate more of the older people who qualified to apply for the CSSA. In May 2017, the government relaxed the assets limit for the OALA scheme (see Table 1). The revised policy thus extended the coverage of the OALA. Starting on 1 June 2018, the government further strengthened the OALA by adding a new tier to the existing OALA scheme. The new tier (i.e. the higher OALA) offers a monthly allowance that is 50% higher than the previous one but imposes a stricter assets limit (See Table 1).

This round of reforms created natural experimental conditions for assessing the effectiveness of social pension schemes in influencing the prevalence of poverty among Hong Kong's older population. However, no prior research has strictly assessed the effects of the three aforementioned critical reforms based on an experimental design. This current study focused on assessing the effectiveness of the new tier of higher OALA on the prevalence of income-based and expenditure-based poverty among older adults.

1.2. Social pension and labor force participation

Labor participation is a critical component of an institutionalized life course heavily affected by labor policies. The effect of the higher OALA

Table 1
The eligibility and benefit of CSSA, OAA, OALA, and higher OALA schemes.

	CSSA		OAA		OALA		Higher OALA	
	Eligibility	Benefit	Eligibility	Benefit	Eligibility	Benefit	Eligibility	Benefit
2013 (Baseline)	No age limit Assets limit per person: HKD 47,000; Income limit per person: HKD 3,200 per month	HKD 5,548 per month per person on average	Universal plan covering all adults aged 70	HKD 1,325 per month per person	Aged 65 or above Assets limit per person: HKD 225,000 Assets limit per couple: HKD 341,000	HKD 2,565 per month per person	N.A.	N.A.
February 2017	Same as above, but removed 'bad son statement' to encourage more eligible older people to apply	Same as above*	Same as above	Same as above*	Same as above	Same as above*	N.A.	N.A.
May 2017	Same as above	Same as above	Same as above	Same as above	Assets limit per person: HKD 329,000 Assets limit per couple: HKD 499,000	Same as above	N.A.	N.A.
June 2018	Same as above	Same as above*	Same as above	Same as above*	Same as above	Same as above*	Aged 65 or above Assets limit per person: HKD 144,000 Assets limit per couple: HKD 218,000	HKD 3,435 per month per person

Note. Only key information is presented. CSSA = Comprehensive Social Security Assistance. OAA = Old Age Allowance. OALA = Old Age Living Allowance. N.A. = Not available. USD 1 = HKD 7.75. * Minor adjustment may apply based on the inflation index.

on labor participation depends on the relative strength of the motive established by the higher OALA to quit the labor market and the motive established by labor policies that encourage employees to stay. Reviewing previous empirical investigations, we noticed that generous social pensions in welfare regimes (e.g. Canada, Germany) created strong motives for people to leave the labor market or to reduce their working hours (Baker & Benjamin, 1999; Börsch-Supan, 2000; Disney & Tanner, 2000; Hofer & Koman, 2006). In non-social-welfare countries (e.g. India, China, Brazil), where the benefit is quite basic, the effect was ambiguous and obscure (de Carvalho Filho, 2008; Juarez, 2010; Kaushal, 2014; Ning et al., 2016; Ranchhod, 2006).

In the context of population ageing and the weak financial status of its current cohort of older adults (Zhu & Chou, 2018), the Hong Kong government has been encouraging labor participation among older people at the institutional level, which is essentially done through a series of labor policies that construct an institutionalized life course (Chan & Liang, 2013). The specific measures include increasing motives to remain in the labor market (e.g. by examining more strictly eligibility for disability and unemployment welfare schemes that might become motives for early retirement) and removing barriers for employers to recruit older adults (e.g. cancelling mandatory retirement requirements, examining routine salary increases with age). In Hong Kong, the labor force participation rate among older people, aged 65 or above, almost doubled between 2008 and 2018, increasing from 5.2% to 11.7% in that time (Hong Kong in Figures 2018). When older adults showed a growing interest in labor force participation, it is particularly interesting to examine whether the significant increase in social pension, i.e., the higher OALA that is 50% higher than the regular OALA, was sufficiently powerful to shake the institutionalized life course established by the government that encouraged older adults to stay in the labor market.

1.3. Social pension and financial support from non-co-resident adult children

The social norms of reciprocal exchange and the cultural norms of filial piety can institutionalize financial transfers to older parents as a component of the life course (Costa, 1997; Cox & Jakubson, 1995; Yeatts et al., 2013). The reciprocal exchange theory suggests that parents invest in the education of their children, and in return, it is the responsibility of adult children to establish retirement income security for their parents (Peng, Wang, Zhu, & Zeng, 2023). In Asian societies, where Confucian values are dominant, filial piety is a strong cultural norm, and non-co-resident adult children offer financial support to their parents as a demonstration of their cultural conformity (Ko & Möhring, 2021; Schwarz et al., 2010; Yeatts et al., 2013). Chan and Chou (2018) report that, among older people who fall within the income-based and asset-based 'poor' range, the family support they receive contributes between 34.1% and 45.6% of their total income. In-depth interviews reveal that poorer older people still wish to receive additional financial support from their non-co-resident children to pay for leisure activities after they engage with one of the social pension schemes, and this financial support is interpreted by the older parents as compensation for the inadequate instrumental care received from their non-co-resident adult children (Ng et al., 2002).

Whether a social pension substitutes for financial support from non-co-resident children depends somewhat on whether the social pension is sufficient to affect the institutionalized life-course arrangement by taking over the responsibility for caring for older parents. In the non-welfare societies such as rural areas in mainland China, non-generous social pension did not significantly crowd out the finical support from the non-co-resident adult children to their older parents (Ning et al., 2019). In welfare societies, such as Japan and certain European countries, generous social pensions send a signal that responsibility is transferred to the government, prompting reduced financial support from non-co-resident adult children (Albertini et al., 2007; Taniguchi & Kaufman, 2017; Yamato, 2006). Therefore, we were particularly

interested in examining whether the substantial growth in a social pension in Hong Kong, i.e., the higher OALA that is 50% higher than the regular OALA was sufficiently powerful to shake the institutionalized financial transfers from non-co-resident adult children to older parents.

Overall, the review directed this current research to address three objectives: 1) whether the higher OALA had affected labor force participation rate among older adults and financial support from their non-co-resident adult children; 2) whether the higher OALA had affected household income and household expenditure; and 3) whether the higher OALA had influenced income-based and expenditure-based poverty.

2. Methodology

2.1. Procedure

Our team collected the first and second waves of data in 2015 and 2017, thereby providing the key variables for this study. Following the reform of the higher OALA in mid-2018, we conducted another wave of data collection in 2019. The target population for this study was Hong Kong residents aged 60 or above. In 2015, we approached the Census and Statistics Department for a large sample list of living quarters based on their Register of Quarters and Register of Segments. We then adopted a stratified sampling design to confirm our target sample of living quarters on the basis of geographical areas and types of quarter. To date, this has been the most complete and authoritative sampling framework available in Hong Kong. After excluding vacant households and households without an older member, aged 60 or above, we successfully visited 2,817 households in 2015 and conducted face-to-face structured interviews. The older people interviewed were selected based on the last birthday rule. Ethical approval was obtained from The Education University of Hong Kong three months before data collection. A mini-test, comprising ten questions, was conducted to check the memory of the older participant before the formal interview started. A family member was invited to answer questions on behalf of any older participant who failed to pass the memory test, after seeking the approval of the older respondent. To establish interrater reliability, we appointed a research assistant who was asked to supervise and monitor all face-to-face interviews. Cash coupons were offered to older participants who completed the interviews.

The second wave of data collection was conducted two years later, in 2017. This aimed to include the same participants who were interviewed in the first wave. A total of 1,696 participants were successfully interviewed for a second time. The third wave of data collection was conducted in 2019, one year after the higher OALA was implemented. We now approached all the older participants who had been included in wave two and successfully interviewed 838 of them. The older people involved in all three waves of data collection (N = 838) constitute the three-wave sample used in this study.

2.2. Measures

We followed the 'full income concept' (Atkinson, 2015) in measuring the household incomes of participants. The respondent was invited to report the monthly income of each household member, with eight possible sources being identified (see Table 2). We also assessed household expenditure by developing items that captured 14 aspects of consumption (see Table 2). Personal assets were assessed by asking the older people to report on 11 types of asset (see Table 2). Totals were calculated for all income sources, all expenditure, and all types of assets. The thematic report of the Hong Kong government shows that the median income in 2016 among households including older adults was HKD 15,500 (Census and Statistics Department 2016), which is very close to that calculated in 2017 for our dataset (i.e. HKD 18,000) after taking inflation into account, thus confirming the accuracy of our measurement.

Table 2
Measurement of household income, household expenditure, and individual assets.

Financial indicator	Item
Household income	Income of each household member generated from: • Labor participation (i.e., full-time employment, part-time employment, self-employment, family business, housing allowance, other allowance, bonus, etc.); • Private pension; • Investment (i.e. stocks, bonds, fixed deposit, current deposit, annuity, rental income, and other investments); • Financial support received from family members living separately; • 11 social welfare and social pension plans (e.g., different types of CSSA, OAA, OALA, Individual-based Work Incentive, Transport Subsidy); • 9 subsidy schemes for the next generation (e.g., Examination Fee Remission Scheme, Financial Assistance Scheme for Post-secondary Students); • 14 Community Care Funds (e.g. Dental Assistance Program for Older People, Medical Assistance Program); • Other income
Household expenditure	Family expenditure in the following aspects: • Expenditure for food (excluding dining out), dining out, cigarettes, and alcoholic drinks in the last week; • Expenditure for communications (telephone, mobile, and Internet), utilities (electricity, water, and gas), hiring domestic helpers, transportation (including driving related expenditure such as gasoline and parking fees), daily necessities (e.g., laundry powder), and entertainment (e.g., movie) in the last month; • Expenditure for furniture, household appliances (e.g., TV, refrigerator, air conditioner), and family trips in the last year; • Educational payments for children (e.g. tuition fees, tutorial fees); • Financial transfers to family members living elsewhere; • Expenditure for medical services, healthcare products (including fitness equipment), and beauty products in the last year; • Expenditure for electronic devices (e.g., mobile phone, laptop), bicycles, vehicles, and their maintenance in the last year; • Contribution to each retirement scheme in the last year; • Tax payments in the last year (e.g., income tax, profit tax, indirect taxes levied on properties, property tax); • Property management fees and rental fees in the last year; • Donations in the last year; • Expenditure for life insurance and medical insurance in the last year; • Financial support to relatives or other family members not living together in the last year; • Other expenditure in the last year;
Personal assets	Personal assets distributed in: • Cash, fixed deposit, current deposit; • Stock; • Bonds; • Self-occupied property; • Hong Kong and oversea non-residential property (e.g. storefront); • Hong Kong and oversea business; • Balance in the retirement saving scheme (e.g., MPF); • Movable property (e.g., vehicle); • Trust fund; • Deposit insurance; • Other personal assets;

Note. CSSA = Comprehensive Social Security Assistance. OAA = Old Age Allowance. OALA = Old Age Living Allowance. MPF = Mandatory Provident Fund.

Household income, expenditure and personal assets were adjusted for inflation and expressed in 2019 Hong Kong Dollars (World Bank, 2021). Labor participation was coded as a dummy variable and as either having earned income (i.e. economic activity) or not having earned income (i.e. economic inactivity). Firstly, we identified poor households by income: this is set as half the median household income divided by

the square root of household size (HKCSS, 2013a). Secondly, expenditure-based poverty was empirically defined as a household with expenditure lower than the median adjusted for household size (Cheung & Chou, 2019). The Household Expenditure Survey conducted by the CSD provided the data source of the benchmark of household expenditure).

We invited older participants to report total financial transfers from all non-co-resident adult children, which were inter-household financial transfers and were one critical component of the monthly income of older households (see Table 2).

2.3. Data analysis

The group assignment warrants consideration. There are two workable options for defining an experimental group (Lee et al., 2019). The group assignment can be conducted at the pretest stage by assigning older participants qualifying for treatment to an experimental group. Alternatively, group assignment can be performed at the posttest stage by assigning older participants benefiting from the treatment to the experimental group. Considering the definition of an experimental group at the posttest level as endogenous, where group selection can be contaminated by individual choice, we conducted our group assignment at the pretest stage. We assigned to the experimental group participants who, in 2015, were eligible for the higher OALA but were not eligible for the CSSA on the basis of their assets threshold. Other participants in the sample were assigned to the control group. We adopted assets rather than income as the criterion, because assets would be a more stable economic indicator across the three waves of data collection.

Our group assignment strategy determined that the economic status of the experimental group was different with that of the control group. As shown in Fig. 1, there were different outcome trends for the two groups (see Fig. 1). The different outcome trends prompted us to consider triple differences (DDD) rather than the classical difference in difference (DD) as our evaluation approach (Blundell & Dias, 2009; Lee et al., 2019). For the DDD, two higher-order years were created, namely '2015–2017' and '2017–2019'. There were DDs within the two higher-order years. We set 2015 as the first pretest time and 2017 as the first posttest time. This was seen as a counterfactual situation, without policy intervention, and was used to define the first DD. We then followed this by setting 2017 as the second pretest time and 2019 as the second posttest time to define the second DD. The DDD was then defined as the difference between the two DDs. This was thus the deviation of the residual common trend between the two groups and was defined as the effect of the policy intervention (i.e. of the higher OALA).

We first calculated the descriptive statistics of DDDs of six outcome variables (i.e., economic activity, financial transfers from non-co-resident adult children, household income, household expenditure, income-based poverty, and expenditure-based poverty). Then we modelled the DDD as a triple interaction term in multiple linear regression estimations (or linear probability regression), which incorporated important covariates that directly affected labor participation and financial support from non-co-resident children and indirectly affected household income and poverty indicators. The covariates included gender, age group, housing type, number of close adult children, household size, working disability, unemployment status, and economic activity. The triple interaction was calculated as the product of group status (experimental or control group), time (i.e., pretest or posttest), and higher-order year (2015–2017 or 2017–2019). The descriptive DDD and coefficient of the triple interaction in the regression model indicated the effect of the higher OALA.

After completing the primary analysis, we performed a sensitivity test to check the reliability of the estimated coefficient of triple interaction in the linear probability regression model that examined the effect of the higher OALA on the income-based poverty rate. In the sensitivity analysis, we changed the empirical definition of income-based poverty and adopted the official family-income poverty lines published by Hong Kong Government in 2015, 2017, and 2019 (see Appendix 1; Census and Statistics Department, 2020). The linear

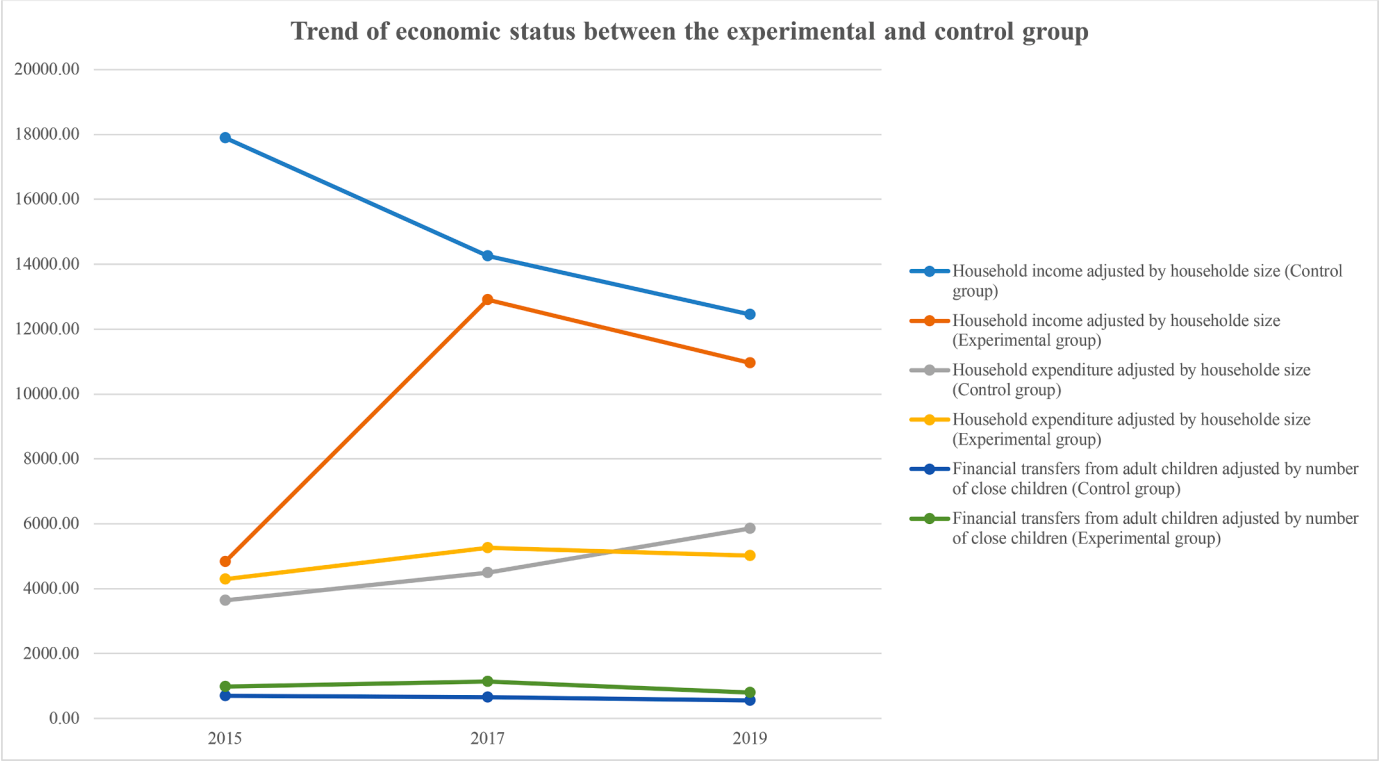

Fig. 1. Different trends of household income, household expenditure, and financial transfers from non-co-resident adult children in the experimental and control group.

probability model was re-evaluated, and the estimated coefficients were reported and compared to those in the primary analysis.

3. Results

Based on the grouping strategy (i.e., assigning those eligible for the higher OALA but were not eligible for the CSSA based on their assets threshold in 2015 into the experimental group and all others to the control group), we excluded those receiving CSSA in 2017 and 2019 in the experimental group (N = 36 in 2017 and N = 24 in 2019) and those receiving OAA (N = 95) or ordinary OALA (N = 72) in both groups in 2019 to avoid their interruptions on the estimates of DDDs. For OAA, it could be prior respondents who were not eligible for OAA reached the age limit of 70. For OALA, this could be the result of the relaxation of asset limits in the social pension reform. The finalized three-wave sample was composed of 615 participants.

We performed a formal attrition analysis and the results are reported in Table 3. It was reasonable that the proportion of younger participants (those aged 60−69 or 70−79 in 2015) was higher among those who were survivors in 2019 than among the dropouts in 2019. We also noticed that the percentage of participants with worse economic status (living in public rental housing, with a working disability, receiving CSSA, or not having an earning income) in 2015 was higher among the survivors in 2019 than among the dropouts in 2019. Thus, our finalized three-wave sample may represent the less economically advantaged older population instead of the general older population in Hong Kong.

Among 615 participants, a total of 371 participants were assigned to the experimental group and a total of 244 participants were assigned to the control group, based on their qualification for treatment in 2015 (i.e., their asset level in 2015). The descriptive statistics for the two groups in the three waves are reported in Table 4. Checking the group assignments in 2015, we found no significant differences in gender, age, number of close adult children, housing type, unemployment rate, and economic activity between the experimental and control groups. There was a significant difference between the two groups for household size, working disability, income-based poverty, expenditure-based poverty, and status of receiving CSSA. This concern was relaxed by controlling for all these variables in the triple difference estimation.

Descriptive statistics of difference, the difference in difference, and DDD are reported in Table 5. As shown, descriptive DDDs for household income adjusted by household size (DDD = -11,853), household expenditure adjusted by household size (DDD = -1,724), labor force participation rate (DDD = -1.36%), and financial transfers from non-co-resident adult children (DDD = -467) were negative. Descriptive DDDs for income-based and expenditure-based poverty (DDD = 12.8% and 12.5%) were positive. These descriptive DDDs consistently showed that implementing the higher OALA decreased household income and expenditure and increased the prevalence of poverty by causing crowding-out effects, i.e., reducing both labor force participation and financial support from adult children.

The triple difference estimation results in all multiple linear regressions and linear probability regressions are reported in Table 6. Specifically, it was found that the higher OALA significantly reduced intergenerational transfers (b = -819.7, $p < 0.001$ when covariates were not controlled; b = -826.3, $p < 0.001$ when covariates were controlled); significantly increased the prevalence of income-based poverty household income (b = 9.7%, $p < 0.001$ when covariates were not controlled; b = 9.3%, $p < 0.001$ when covariates were controlled); and significantly promoted the prevalence of expenditure-based poverty (b = 8.1%, $p < 0.001$ when covariates were not controlled; b = 8.3%, $p < 0.001$ when covariates were controlled). The triple difference estimation results also revealed that the higher OALA did not significantly influence labor force participation, household income, and household expenditure.

In addition, we noticed that the regression model revealed that being male was associated with a higher prevalence of expenditure-based poverty (b = 4.6%, $p < 0.001$). The regression model also showed that the number of close adult children was significantly associated with lower income-based and expenditure-based poverty (b = -8.8%, $p < 0.001$; b = -3.0%, $p < 0.001$). The following section mainly discusses the three significant triple difference estimations in the regressions after controlling for covariates in Table 6, which look consistent with the

Table 3
Attrition analysis.

	Dropouts, 2015–2019 (N = 1,979) %, mean, in 2015	Survivors in 2019 (N = 838)
Male (%)	45.9	45.8
Age: 60-69 (%)	24.4***	31.9***
Age: 70-79 (%)	23.6***	34.7***
Age: 80-89 (%)	31.1	33.4
Number of close adult children	1.97	2.04
Public rental housing (%)	57.8***	83.8***
Household size	2.42	2.40
Working disability (%)	3.8*	5.8*
Unemployment (%)	0.5	1.0
Having earning income (%)	8.1*	5.5*
Income-based poverty (%)	25.9	27.0
Expenditure-based poverty (%)	20.6	20.9
CSSA recipient (%)	14.4***	20.8***

Note. CSSA = Comprehensive Social Security Assistance. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table 4
Sample descriptive statistics of two groups (N = 615).

	2015 (%, mean)		2017 (%, mean)		2019 (%, mean)	
	CON (N = 244)	EXP (N = 371)	CON (N = 244)	EXP (N = 371)	CON (N = 244)	EXP (N = 371)
Male (%)	44.8	44.5	44.8	44.5	44.8	44.5
Age: 60-69 (%)	32.8	33.2	26.2	24.8	16.8	15.1
Age: 70-79 (%)	33.2	31.5	30.7	35.0	33.2	36.1
Age: 80-89 (%)	34.0	35.3	43.1	40.2	50.0	48.8
Number of close adult children	1.62	2.21	1.61	2.34	1.62	2.35
Public rental housing (%)	85.7	83.6	85.7	83.6	85.7	83.6
Household size	1.86***	2.64***	1.86	2.53	1.88	2.59
Working disability (%)	8.6*	3.8*	12.3	8.1	12.3	8.1
Unemployment (%)	0.8	1.1	0.4	0.8	0.4	0.8
Having earning income (%)	5.3	6.5	4.1	6.5	3.7	5.9
Income-based poverty (%)	41.0***	19.1***	36.9	11.1	37.7	20.8
Expenditure-based poverty (%)	66.4***	1.1***	54.1	0.0	38.5	8.1
Recipient of CSSA (%)	68.9***	0.0***	59.8	0.0	33.2	0.0
Recipient of OAA (%)	n/a	n/a	n/a	n/a	0.0	0.0
Recipient of Ordinary OALA (%)	n/a	n/a	n/a	n/a	0.0	0.0
Recipient of Higher OALA (%)	n/a	n/a	n/a	n/a	51.6	57.7

Note. CON = Control group. EXP = Experimental group. CSSA = Comprehensive Social Security Assistance. OAA = Old Age Allowance. OALA = Old Age Living Allowance. CON = Control group, EXP = Experimental group. Assessment of structural differences between the experiment and control group was only conducted in the data collected in 2015. For Chi-square and t test, *** $p < 0.001$. ** $p < 0.01$. * $p < 0.05$.

Table 5
Descriptive statistics of triple differences.

			CON	EXP	D/DD				CON	EXP	D/DD
Household income [1]	2015-2017	Pretest	17,890	4,828	-13,062	Labor participation (%)	2015-2017	Pretest	5.33	6.47	1.14
		Posttest	14,261	12,913	-1,348			Posttest	4.1	6.47	2.37
		D/DD	-3,629	8,085	11,714			D/DD	-1.23	0	1.23
	2017-2019	Pretest	14,261	12,913	-1,348		2017-2019	Pretest	4.1	6.47	2.37
		Posttest	12,452	10,965	-1,487			Posttest	3.69	5.93	2.24
		D/DD	-1,809	-1,948	-139			D/DD	-0.41	-0.54	-0.13
		DDD		**-11,853**				DDD		**-1.36**	
			CON	EXP	D/DD				CON	EXP	D/DD
Household expenditure [1]	2015-2017	Pretest	3,646	4,291	645	Financial transfers from non-co-resident adult children [2]	2015-2017	Pretest	700	982	282
		Posttest	4,496	5,263	767			Posttest	651	1,145	494
		D/DD	850	972	122			D/DD	-49	163	212
	2017-2019	Pretest	4,496	5,263	767		2017-2019	Pretest	651	1,145	494
		Posttest	5,861	5,026	-835			Posttest	553	792	239
		D/DD	1,365	-237	-1,602			D/DD	-98	-353	-255
		DDD		**-1,724**				DDD		**-467**	
			CON	EXP	D/DD				CON	EXP	D/DD
Income-based poverty (%)	2015-2017	Pretest	41	19.1	-21.9	Expenditure-based poverty (%)	2015-2017	Pretest	66.4	1.1	-65.3
		Posttest	36.9	11.1	-25.8			Posttest	54.1	0	-54.1
		D/DD	-4.1	-8	-3.9			D/DD	-12.3	-1.1	11.2
	2017-2019	Pretest	36.9	11.1	-25.8		2017-2019	Pretest	54.1	0	-54.1
		Posttest	37.7	20.8	-16.9			Posttest	38.5	8.1	-30.4
		D/DD	0.8	9.7	8.9			D/DD	-15.6	8.1	23.7
		DDD		**12.8**				DDD		**12.5**	

Note. [1] Adjusted by household size. [2] Adjusted by number of close adult children. D = Difference. DD = Difference in difference. DDD = Triple difference. CON = Control group. EXP = Experimental group.

Table 6
Multiple linear regression and linear probability regression estimations for the effect of the higher OALA on outcome indicators.

	Having earning income[1]		Financial transfers from non-co-resident adult children[2]		Household income[2]	
Experimental status × Time × Higher-order year	-0.005	0.001	**-819.677*****	**-826.341*****	-4212.385	-4717.317
Experimental status × Time	-0.001	0.004	254.582	189.166	9923.982*	9695.208*
Experimental status	0.022	0.014	1394.438***	1260.270***	-4771.198	-13928.402***
Being male		0.048***		10.394		2911.938
Aged over 80		-0.079***		140.566		902.174
Number of close adult children		-0.002		660.729***		8291.679***
Household size		0.002		-391.982***		4643.748***
Living in the public rental housing		-0.053***		-855.921***		-21262.779***
Have earning income		n/a		-1317.693***		4167.152
Having working disability		-0.090***		n/a		n/a
Being Unemployed		-0.068		n/a		n/a
	Household expenditure[2]		Income-based poverty[1]		Expenditure-based poverty[1]	
Experimental status × Time × Higher-order year	-274.864	-383.830	**0.097*****	**0.093*****	**0.081*****	**0.083*****
Experimental status × Time	973.892*	1039.318*	-0.040	-0.035	-0.005	-0.006
Experimental status	3681.840***	2124.044***	-0.230***	-0.171***	-0.527***	-0.475***
Being male		-429.773		0.024		0.046***
Aged over 80		21.020		0.028		0.001
Number of close adult children		500.749***		-0.088***		-0.030***
Household size		1551.683***		0.012		-0.034***
Living in the public rental housing		-3300.906***		0.092***		0.131***
Have earning income		1317.961		-0.219***		-0.157***

Note. Unstandardized estimates are reported. [1] Linear probability regression. [2] Multiple linear regression.

respective three descriptive DDDs in Table 5. The sensitivity test results in Appendix II validated the significant effect of the higher OALA on promoting income-based poverty in Table 6.

4. Discussion

With a natural experimental condition created by the introduction of the higher OALA in 2018 and the three waves of data collected in 2015, 2017 and 2019, this study adopted the triple difference estimation to evaluate how the higher OALA had influenced the poverty of Hong

Kong's older population. Results reveal that the higher OALA did not influence labor participation but reduced intergenerational financial transfers received by older people. Subsequently, it is unsurprising that the prevalence of income-based and expenditure-based poverty among older adults has increased. The implementation of the higher OALA, as a critical social policy reform, was found to cause a crowding-out effect, influence the institutionalized life course, and deviate from the route of mitigating poverty. The Hong Kong experience of expanding social pensions by substantially increasing its recipient's benefit is worth discussing. The implications of our findings can be valuable references for other non-welfare regimes that plan to strengthen their social pension scheme.

First, it is too early to conclude that the higher OALA has not successfully mitigated the poverty rate among older adults. The crowding-out effect we identified motivates future research to explore the underlying causes of reduced financial transfers from non-co-resident adult children to older parents with qualitative interviews. According to the reciprocal exchange theory, adult children reduce financial support to their older parents probably because adult children interpret the higher OALA as a signal that the government is willing to take the responsibility to finance the retirement life of old people (Costa, 1997; Cox & Jakubson, 1995; Yeatts et al., 2013). If that is true, social policymakers should consider further increasing the benefit of the higher OALA to significantly promote household income and expenditure and mitigate income-based and expenditure-based poverty. Besides, the reciprocal exchange theory also interprets the nature of financial transfers to older parents as the exchange for the instrumental support older parents provided to adult children (e.g., taking care of grandchildren from time to time). When older parents receive a higher OALA, the opportunity cost to provide services to adult children increases (Gerardi & Tsai, 2014). If the adult children's demand for services is inelastic, there will be an increase in "service payments" in order to receive the same level of services. In other words, the demand for services will likely be elastic when adult children reduce financial transfers after their older parents receive the OALA. If that is the case, further increasing the benefit of the higher OALA may weaken the family tie between adult children and parents. In general, our findings call for more research to explore the nature of financial transfers from non-co-resident adult children to older parents to advise policymakers on the future direction of reforming the higher OALA.

Second, the crowding-out effect we identified can be explained by the structure of the sample. A total of 83.8% of older participants lived in public rental housing in the entire sample and 83.6% in the experimental group (vs. 60% in the large-scale survey conducted by Hong Kong Housing Authority [2021]). Housing cost burdens are common among economically disadvantaged older people in Hong Kong. A recent survey found that poorer older adults were susceptible to rising housing costs in the future (Bai, 2019). Of the lower-income older families interviewed by Hong Kong Housing Authority (2021), around 15% lived in subdivided units, cubicle apartments, or rental bed places, with disappointing environments and floating market prices. The rental fee of public rental housing is much lower than the rental cost in the free market. Older adults who have successfully applied for public rental housing are more likely to live a stably dignified life compared to those renting a place in the market. When there is no potential housing burden for their older people, their adult children are more likely to follow the altruism model (Barro, 1974; Becker, 1974) and adjust the financial transfers to be lower when older people start receiving the higher OALA. The core of the altruism model is the prediction of redistribution neutrality, which suggests that the adult children will adjust their transfers according to the older parents' income change (Barro, 1974; Becker, 1974). Therefore, future research may consider replicating our design among older adults not assigned a place of public rental housing, not owning private housing, and having to look for a residential place in the housing market.

5. Limitations

Although triple difference estimations generate implications for social pension reform in Hong Kong, we acknowledge two limitations when interpreting the results. First, 51.6% of participants in the control group were recipients of the higher OALA in 2019. About 30% of them were likely to be CSSA recipients in 2017. Personal stigma, social stigmatization, or claim stigma might motivate older people to quit the CSSA and engage in the higher OALA once the government implements the higher OALA. The asset status of the other 20% might worsen in 2019, which enabled them to qualify for the higher OALA (including those who adjusted the assets under their names to pass the means test of the higher OALA). Since switching from the CSSA to the higher OALA reduced monthly income while becoming the fresh recipients of the OALA increased it, the recipients of the higher OALA in the control group may not affect the triple difference estimation. Second, our measurement cannot differentiate the proportion of receiving OAA and original OALA in 2015 and 2017 because of the confusing statement in the questionnaire. We improved the assessment instrument in 2019 that asked participants to report the status of receiving OAA and OALA, respectively.

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Declaration of Competing Interest

The author declares no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data availability

Data will be made available on request.

Ethical Statement

The ethical approval was obtained from the Human Research Ethics Committee (HREC) of The Education University of Hong Kong before the data collection.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Appendix I

Official income-based poverty lines in 2015, 2017 and 2019 (used for the sensitivity test)

	Cut-off total household income in HK$		
Household size	2015	2017	2019
1	3,800	4,000	4,500
2	8,800	9,800	10,000
3	14,000	15,000	16,600
4	17,600	19,900	21,400
5	18,200	20,300	22,100
>=6	19,500	22,500	23,000

Appendix II

Sensitivity test: Linear probability regression estimations for the effect of the higher OALA on the income-based poverty (using the official family-income poverty lines)

	Income-based poverty	
Experimental status × Time × Higher-order year	0.097***	0.094***
Experimental status × Time	-0.043	-0.037
Experimental status	-0.196***	-0.147***
Being male		0.026
Aged over 80		-0.019
Number of close adult children		-0.081***
Household size		0.017
Living in the public rental housing		0.074***
Have earning income		-0.210***

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