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RESEARCH PAPER

Spend it, save it, or transfer it?

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Abstract

We are the first to study how the resources freed up when a child, child-in-law, or grandchild moves out of a household are reallocated, taking into account the age of the leaver. Using the 2011 and 2013 waves of the China Health and Retirement Longitudinal Study, we document that, on average, the remaining household members save part of the resources freed up by the leaver and consume another part. Differentiating the leavers by age, we find that after the departure of a member of the younger generation aged 0–24, the remaining household members save the resources freed up by the leaver. However, if the leaver is above 24, they spend the freed-up resources. Our results are robust to the use of different specifications, estimation methods, and consumption aggregates. Finally, we observe that remittances directed toward non-resident offspring do not increase after the departure of a member of the younger generation.

Keywords: China; consumption; household composition; remittances

JEL classification: D12; D14

1. Introduction

Multigenerational co-residence is traditionally highly valued in China (Guo et al., 2018; Xu, 2019). Due to a poorly developed social welfare system, parents are heavily dependent on their children – both physically and economically – in their old age (Zhao & Zhong, 2019). In exchange for eldercare, they invest as much as they can in their children's education and marriage. It is also common for parents to support their co-resident married children and children-in-law by providing free accommodation, food, and childcare (Zhang et al., 2014).

Yet, due to globalization, urbanization, and the diffusion of Western values, more and more young people move out of their parents' homes (Xu et al., 2019). This tendency was accentuated after 2008, when, to alleviate the effects of the Global Financial Crisis, China implemented a massive economic stimulus package (the "Four Trillion" Economic Stimulus Plan) and, as a result, maintained a relatively high economic growth rate

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compared to many other countries (Burdekin & Weidenmier, 2015; Liu et al., 2018). This growth was accompanied by an accelerated pace of urbanization and industrialization, which led to a significant rural-to-urban migration trend, as urban areas promised higher incomes and better living conditions. At the same time, a growing number of older adults prefer to live nearby their children instead of cohabiting with them, primarily to preserve their autonomy and freedom (Meng et al., 2017). In line with these arguments, Giles et al. (2010) document that while around 70% of Chinese adults aged over 60 and living in rural areas co-habited with an adult child in 1991, this percentage had fallen to 40% by 2006.[1] This trend has been continuing in recent years: data from the China Health and Retirement Longitudinal Study (CHARLS) suggest that 19.79% of families experienced the departure of a member of the younger generation between 2011 and 2013.[2]

This paper investigates how the resources freed up when a member of the younger generation moves out of a household are reallocated. Do the remaining household members consume the resources freed up by the young leaver? Do they save them? Or do they transfer them to the offspring who recently moved out?

Although a number of theoretical and empirical studies emphasize the role of demographics on household consumption and saving patterns (Curtis et al., 2015; Deaton et al., 1989; Ge et al., 2018; Modigliani & Brumberg, 1955), only a few studies focus on the effects of changes in household composition on consumption, looking at how resources are reallocated in a household with a child moving out. Among these, Coe and Webb (2010) and Dushi et al. (2021) argue that US parents use most of the resources freed up after the departure of a child to increase their consumption. Focusing on German and Italian households, Rottke and Klos (2016) show that part of the freed-up resources is saved and part is consumed.[3]

We extend this body of work in three ways. First, for the first time, we focus on the Chinese case, which is important in light of the trends documented above. Second, considering that multigenerational co-residence is traditionally highly valued in China (Guo et al., 2018; Xu, 2019) and that around 40% of children are taken care of by their grandparents (Deng & Tong, 2020), we consider, for the first time, the departure of grandchildren and children-in-law, in addition to the departure of children. Third, we take into account the effects of the age of the leavers, which has been overlooked in previous literature. This is important as the resources freed up by the leavers are likely to vary depending on their age (Fernández-Villaverde & Krueger, 2007). Moreover, people of different ages are likely to move out of their households for different reasons. This will, in turn, impact how remaining household members deal with the resources freed up by their departure.

Using data from the 2011 and 2013 waves of the CHARLS, we find that, after the departure of a member of the younger generation, on average, the remaining household members save part of the resources freed up by the leaver and consume

[1]Meng and Luo (2008) document a similar trend for urban households. Also see Cheng et al. (2018a) for further evidence.

[2]Members of a household's younger generation include children, grandchildren, and children-in-law. Hereafter, we also refer to them as offspring (intended in a broad sense and regardless of their actual age) or young leavers.

[3]While the papers just mentioned mainly refer to college leavers or children who leave the household because they get married or choose to live independently, offspring can also leave households due to migration. See Section 2.2 for a brief overview of studies focused on the effects of migration.

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another part. Although broadly consistent with Rottke and Klos's (2016) findings, this result is in sharp contrast with Coe and Webb (2010) and Dushi et al. (2021) who document that the remaining household members generally consume the resources freed up by the leaver. It confirms the strong saving motivations characterizing Chinese households, which could be a consequence of the low social welfare benefits and poor development characterizing the Chinese financial markets (Chamon & Prasad, 2010; Cheng et al., 2018b).

Differentiating the leavers by age, we find that if the leavers are aged 0–24, the remaining household members save the resources freed up by their departure. By contrast, if the leavers are above 24, then the remaining household members spend the freed-up resources.[4] Our results are robust to the use of different specifications, different estimation methods including propensity score matching (PSM), as well as different consumption aggregates. Finally, we show that households with young leavers do not increase outward remittances to their non-resident offspring, confirming that they save or consume the freed-up resources rather than providing financial support to the offspring who recently moved out.

The remainder of the paper proceeds as follows. Section 2 surveys some related literature and highlights our contribution. Section 3 illustrates our dataset and presents some descriptive statistics. Section 4 describes our baseline specifications and estimation methodology. Section 5 presents our main empirical results. Section 6 describes a number of further tests. Section 7 discusses whether households with young leavers increase outward remittances to their non-resident offspring. Section 8 concludes.

2. Related literature

Although a number of theoretical and empirical studies emphasize the role of demographics on household consumption and saving patterns (e.g., Curtis et al., 2015; Deaton et al., 1989; Ge et al., 2018; Modigliani & Brumberg, 1955), only a few studies focus on the effects of changes in household composition on consumption/saving, looking at how resources are reallocated in a household with a child moving out. These can be divided into two groups. The first focuses on the effects of changes in household composition due to the departure of children for any reason, whilst the second focuses on the effects of changes in household composition due to migration.

2.1 Studies focused on the departure of children for any reason

A few studies, mainly focused on developed countries, look at how resources are reallocated in a household with a child moving out. Among these, making use of data from Italy and Germany, Rottke and Klos (2016) find that overall household consumption drops after a child moves out of the household, but at the same time, adult-equivalent consumption significantly increases. In other words, after a child's departure, parents upgrade their personal lifestyle, but also save a fraction of the resources freed up by the departing child.

Focusing on the US, Coe and Webb (2010) find no evidence that households decrease consumption after children leave, coupled with a significant rise in consumption per capita. This suggests that the resources freed up by the departed children are entirely

[4]Our empirical analysis focuses on consumption instead of saving, as saving is not provided in our dataset. Also see footnote 18 for more details on this point.

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consumed. Dushi et al. (2021) also focus on US data and find that households in their sample only slightly increase 401(k) contributions after children move out. They conclude, once again, that the majority of the resources freed up by the departing child are consumed. Finally, Biggs et al. (2021) document that after the departure of their offspring, US parents do not save by paying off their mortgage or other debt, do not transfer resources to their departed children, but reduce their hours worked.

2.2 Studies focused on migration

The papers discussed in the previous sub-section do not specify the reason why the children move out of their households. Children may leave for a number of reasons such as going to college, becoming financially independent, getting married and so on. Another reason for departing may be migration. A large literature has looked at the effects of migration on the labor supply, education, and health of the left-behind household members such as parents, spouses, and/or children (see Antman, 2012, for a review of this literature). A few studies, mainly focused on developing countries, investigate how the migration of household members affects the food consumption and/or food security of left-behind families. For instance, Abebaw et al. (2020) find that Ethiopian households with migrants increase the number of daily calories they consume. Nguyen and Winters (2011) reach a similar conclusion for Vietnam. These findings can be explained by the migrants' higher income, part of which is sent home in the form of remittances. Focusing on China, Liu et al. (2021) document that the migration of offspring is associated with a significant improvement of the nutritional status of their left-behind parents. By contrast, Karamba et al. (2011) argue that households in Ghana generally do not significantly increase their food consumption when a household member migrates, as remittances to the left-behind families are not sufficient to compensate for the loss of labor.

Only a few studies investigate the impact of migration on the overall consumption of the left-behind household members. Among these Chandrasekhar et al. (2015) find that households with short-term migrants show a lower consumption per capita in India. These migrants generally work in the unorganized sector without formal contracts or legislation to protect their rights. As a result, their salary is relatively low, and they are not able to transfer a significant amount of money back to their left-behind family members. Romano and Traverso (2019) argue that international migration only positively affects the per capita consumption of the poorest left-behind households in Bangladesh. In the context of China, Wang et al. (2021) make use of the 2013 wave of the CHARLS and find that elderly households with permanent migrant children show a higher share of expenditure on agriculture, whilst households with temporary migrant children show a higher share of food consumption.[5] It is, however, noteworthy that these studies make use of cross-sectional data. As such, they compare the consumption patterns of households with migrants and households without. Their focus is, therefore, different from the papers surveyed in the previous sub-section which look at the effect of the actual moving out of children between one wave and the other on the consumption of left-behind household members in a panel setting.

[5]Several other papers study the effects of migration on left-behind family members in China, but they mainly focus on nutrition, net income, and remittances rather than consumption (e.g., Démurger & Wang, 2016; Du et al. 2005; Liu et al., 2021; Taylor et al., 2003).

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2.3 Contribution

Our paper speaks to these two branches of literature by analyzing the effects of the departure of members of the younger generation on the consumption of the left-behind household members in China.

Specifically, our work adds to the literature surveyed in Section 2.1 in three ways. First, for the first time, we focus on the effects of the departure of members of the younger generation on consumption in the Chinese context. This is important bearing in mind that, as a result of globalization, urbanization, and the diffusion of Western values, more and more Chinese young people move out of their parents' homes (Xu et al., 2019). Second, considering that multigenerational co-residence is traditionally highly valued in China (Guo et al., 2018; Xu, 2019) and that around 40% of children are taken care of by their grandparents (Deng & Tong, 2020), we consider, for the first time, the departure of grandchildren and children-in-law, in addition to the departure of children. Third, we take into account the effects of the age of the leavers, which has been overlooked in previous literature. This is important as the resources freed up by the leavers are likely to vary depending on their age (Fernández-Villaverde & Krueger, 2007). Moreover, people of different ages are likely to move out of their households for different reasons. This will, in turn, impact how remaining household members deal with the resources freed up by their departure.

In our setting, one of the possible reasons why children leave their household is migration. Thus, our work also relates to the small literature which has looked at the effects of migration on total household consumption by making use of a panel data setting. This enables us to look at the effects of offspring actually moving out of the household between one wave and another.

3. Data and summary statistics

3.1 Sample construction

Our analysis is based on the 2011 and 2013 waves of the CHARLS. The survey, which is nationally representative, collects high-quality data for residents aged 45 and above and their spouses.[6] 10,026 households took part in the 2011 wave and 10,624 households in the 2013 wave.[7] Information is also provided about how many additional household members there are, their relationship to the main respondent, and their age.

In order to compare consumption changes between 2011 and 2013 in households with and without leavers, we only consider the 8,786 households who participated in both waves. As the age structure of the household members is a key factor in our analysis, we exclude 1,726 households with missing age information on some of the members. We also exclude 376 households that reported additional members in 2013.[8] Furthermore, as the CHARLS focuses on respondents aged 45 and above, we drop households whose main respondent and/or spouse is aged under 45. This leaves

[6]See Zhao et al. (2014) for more details about the CHARLS.

[7]In the 2013 wave of the CHARLS, the question CM003_W2_1 provides detailed information on the moving out of household members (e.g., if a household member moved out or passed away between 2011 and 2013). However, this question has been excluded in subsequent waves. As a result, we do not use the 2015 and 2018 waves of the CHARLS.

[8]These additional members could be either new household members who joined the household between 2011 and 2013 or household members mistakenly omitted in 2011. As the questionnaire does not allow us to distinguish between the two, we omit them.

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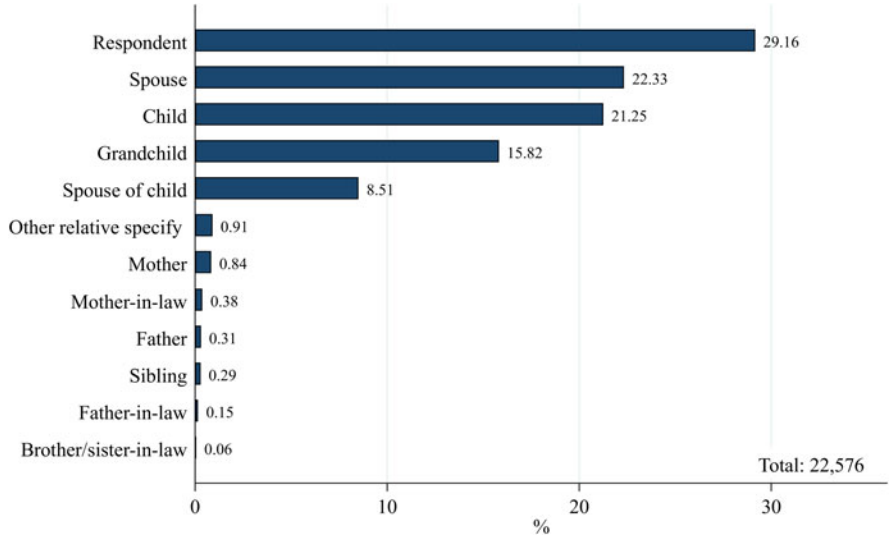


Figure 1. Household composition (percentage) in the CHARLS (2011).
Note: The data is based on our main regression sample where respondents were aged 45 and above in both waves of the survey, and households participated in both waves of the survey and provided age information for every household member.
Source: Authors' calculations based on the CHARLS.

us with 6,843 households. Next, in order to deal with outliers, we set to missing the top and bottom 1% observations of total, non-durables, and non-education expenditure, household income, and household financial wealth. Finally, we exclude observations with missing values for variables included in our models. This leaves us with 11,640 observations over the two years, corresponding to 6,584 households.

3.2 Summary statistics

Our sample is composed of 6,584 households with a total of 22,567 members. Figure 1 shows that more than 51% of these household members are main respondents (29.16%) and their spouses (22.33%). Children and grandchildren account for 21.25 and 15.82% of the total household members, respectively. If we also consider children-in-law, the younger generations' members account for 45.58% of the total.

Figure 2 shows that 4,076 out of 6,584 households (61.91%) in our dataset have members of at least two generations within the family home (i.e., parents living with children/children-in-law and/or grandchildren). There are 1,653 households (25.11%) with at least three generations residing within the family home (i.e., parents, children/children-in-law, and grandchildren), and 1,782 households (27.07%) which only consist of respondent and spouse. These statistics illustrate the diverse composition of Chinese households.

Figure 3 shows the age distribution of household members. 96.24% of main respondents and spouses are aged between 45 and 80. Among other household members, 94.74% are aged between 0 and 50, with more than 93% belonging to the younger generation (children, children-in-law, and grandchildren of main

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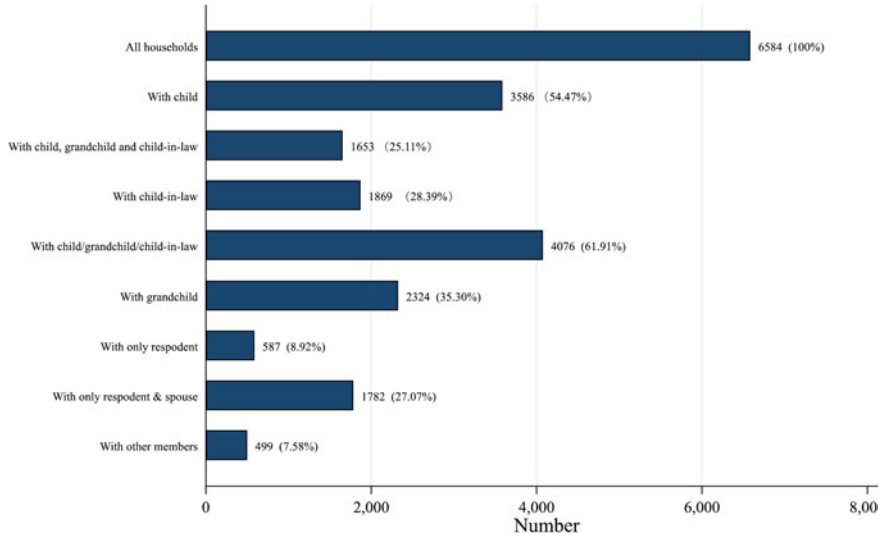


Figure 2. Number (percentage) of households by composition in the CHARLS (2011).
Note: "All Households" are the households used in our main regression models. "With only respondent" represents the households with only one member. "With only respondent and spouse" are the households composed of only the main respondent and his/her spouse. "With child" represents the households with at least one child in residence. "With grandchild" stands for the households with at least one grandchild in residence. "With child-in-law" stands for the households with at least one child-in-law in residence. "With child/grandchild/child-in-law" stands for the households with at least one member of the younger generation in residence. "With child, grandchild, and child-in-law" represents the households who have at least three generations in residence. "With other members" stands for the households with at least one other household member (different from spouse, child, grandchild, and child-in-law) in residence. There are overlaps between certain groups.
Source: Authors' calculations based on the CHARLS.

respondents). Leavers are defined as those who were family members in 2011 but not in 2013 due to moving out from the family home, death, or other reasons. In our sample, 2,799 leavers are reported from within 1,534 households. Figure 4 shows that 87.1% of these leavers belong to younger generations: they are main respondents' children (45.23%), grandchildren (25.08%) and children-in-law (16.79%).

Figure 5 presents the ages of leavers in different categories: The leavers' age ranges from 0 to 111.[9] The most common age range of child leavers is between 20 and 40, which accounts for 88.63% of the total child leavers, and the mean age of a child leaver is 28. Children typically move out of the household when they start their own family and/or become financially independent, which usually happens when they are in their late twenties. Figure 5 also shows that grandchild leavers aged between 0 and 20 count for 92.74% of the total leavers in this category, with a mean age of 10. Most younger generation's household members who move out at ages between 0 and 16 are grandchildren of main respondents. In China, it is normal for grandparents to live with and look after their grandchildren at least for some time (Deng & Tong, 2020; He et al., 2018b). Finally, 96.6% of leaving children-in-law are aged between 20 and 45, and the mean age of leavers in this category is 32.

[9]The leaver aged 111 is a respondent's mother-in-law, who passed away between 2011 and 2013.

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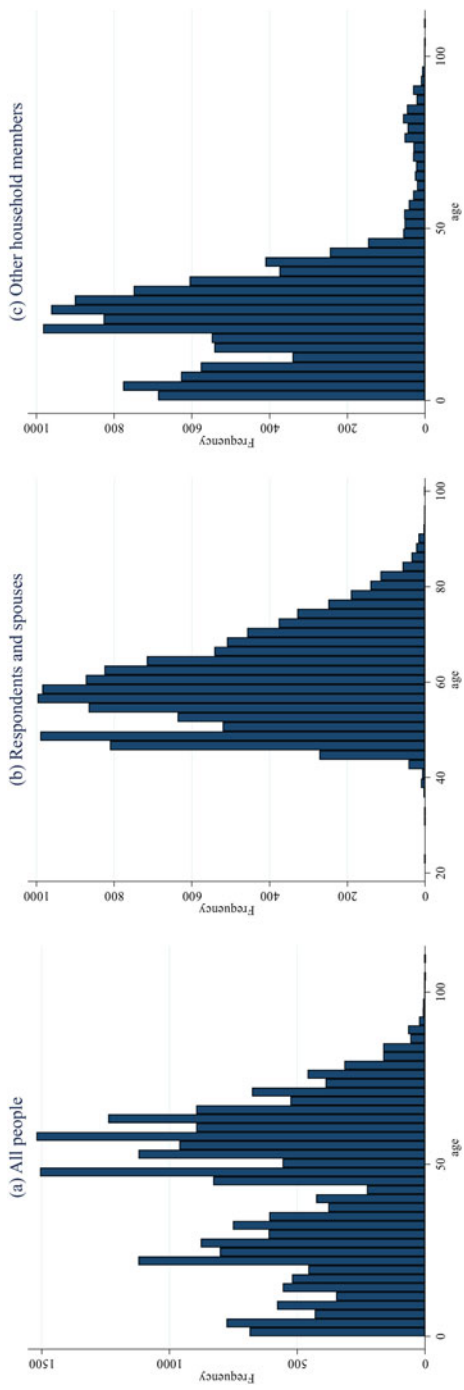


Figure 3. Age distribution in the CHARLS (2011).
Note: The data is based on our main regression sample where respondents were aged 45 and above in both waves of the survey, and households participated in both waves of the survey and provided age information for every household member. "Other household members" represents all the household members apart from respondents and their spouses.
Source: Authors' calculations based on the CHARLS.

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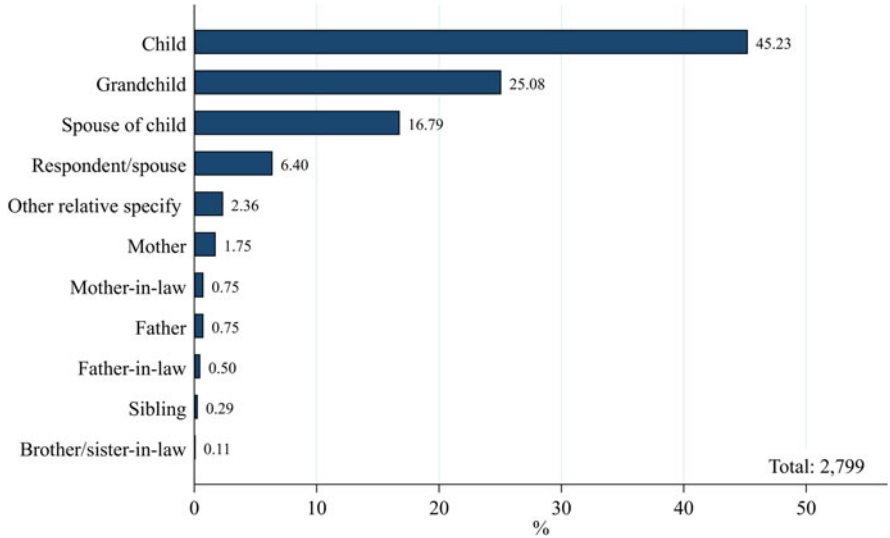


Figure 4. Leavers (percentage) in the CHARLS (2013).
Note: The data is based on our main regression sample where respondents were aged 45 and above in both waves of the survey, and households participated in both waves of the survey and provided age information for every household member.
Source: Authors' calculations based on the CHARLS.

Table 1 presents the composition of leavers across different age groups. We can see that just under 94% of leavers in the age range 0–16 are grandchildren of the respondent. This percentage drops to 18.15% in the age range 17–24, and to 2.29% in the range 25–30. The percentage of children/spouses of children leaving the household ranges from 2.67% in the range 0–16, to 79.76% in the range 17–24, and to 96.29% in the 25–30 range. In the 31+ range, only less than 1% of leavers are grandchildren, 66.28% are children/spouse of children, and the remaining leavers are other household members (e.g., mother, father, and so on).

Table 2 presents details of the various consumption categories that we consider. Appendix Table A1 presents definitions of all other variables used in the paper. Appendix Tables A2, A3, and A4 respectively present descriptive statistics for different categories of consumption, consumption changes of household with leavers between 2011 and 2013, and all the variables used in our models. It is noteworthy that according to Appendix Table A3, the average age of the main respondents in our sample is 61.34. Moreover, the average household size is 3.4 and 37.47% of households are from urban areas. Finally, 89.02% of respondents own their house.

4. Baseline models

4.1 Models accounting for the departure of members of the household's younger generation

We start by studying the response of total, non-durable, and non-education consumption to the departure of any member of the household's younger generation.

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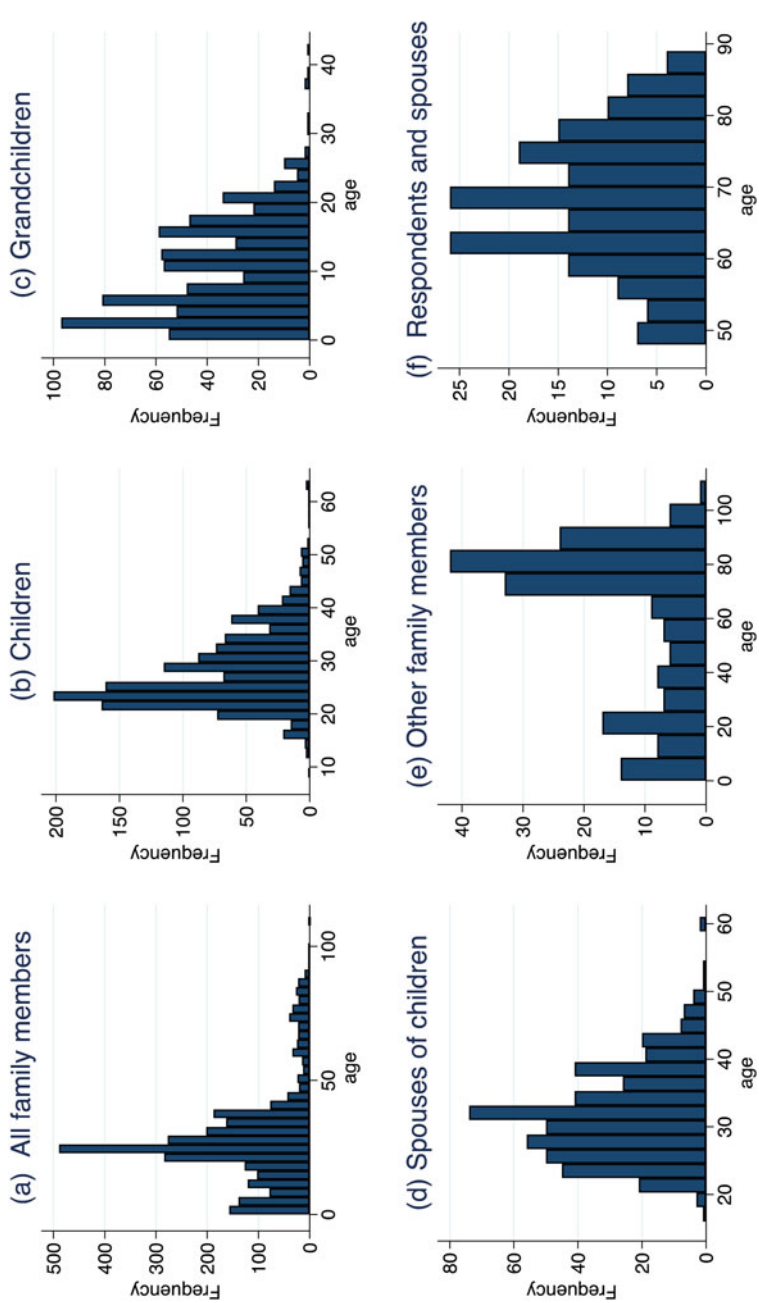


Figure 5. Age distribution of leavers in the CHARLS (2013).
Note: The data is based on our main regression sample where respondents were aged 45 and above in both waves of the survey, and households participated in both waves of the survey and provided age information for every household member.
Source: Authors' calculations based on the CHARLS.

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Table 1. Leavers by age group

	Number	Percentage
0–16		
Child	16	2.67
Grandchild	562	93.82
Other	21	3.51
Total	599	100
17–24		
Child	467	69.49
Spouse of child	69	10.27
Grandchild	122	18.15
Other	14	2.08
Total	672	100
25–30		
Child	390	68.78
Spouse of child	156	27.51
Grandchild	13	2.29
Other	8	1.41
Total	567	100
31+		
Child	393	40.89
Spouse of child	244	25.39
Grandchild	5	0.52
Mother/mother-in-law	70	7.28
Father/father-in-law	34	3.54
Respondent/spouse	179	18.63
Other	36	3.75
Total	961	100

Note: The data is based on our main regression sample where respondents were aged 45 and above in both waves of the survey, and households participated in both waves of the survey and provided age information for every household member.
Source: Authors' calculations based on the CHARLS.

To this end, we estimate the following equation:

$$\log C_{j,t} = \partial + \beta YoungMove_{j,t} + \theta' Controls_{j,t} + u_j + u_t + (u_p * u_t) + \varepsilon_{jt} \quad (1)$$

where log $C_{j,t}$ represents in turn the logarithm of the real total, non-durable, and non-education consumption for household j in year t. We estimate the models for

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Table 2. Consumption categories

Consumption category	2011 Code	2013 Code	Expenditure
Home expenses	GE009_1	GE009_1	Communication fees (including post, internet usage, telephone, and cell phone usage)
	GE009_2	GE009_2	Water and electricity
	GE009_3	GE009_3	Fuels (including gas, coal, etc.)
	GE010_3	GE010_3	Heating (central heating)
	GE010_13	GE010_11	Property management fees (including parking fees)
Food	GE006		Expenditure on food including both purchased food and food grown by the household (consumed at home)
		GE006	Expenditure on food (consumed at home)
		GE006_w2_1	Consumption (at home) of food grown by the household
	GE007	GE007	Expenditure on food consumed outside of the house
	GE008	GE008	Alcohol, cigarettes, cigars and tobacco.
Durables	GE010_11	GE010_9	Automobiles
	GE010_7	GE010_10	Purchase, maintenance and repair of transportation vehicles, appliances, communication products, etc.
	GE010_4		Furniture and consumption of durable goods, including refrigerators, washing machines, TVs, and expensive instruments like pianos.
	GE010_12		Electronics (laptops, computers and accessories, video games, etc.)
Medical (out-of-pocket)	GE010_10	GE010_6	Out-of-pocket medical expenditure
	GE010_5	GE010_7	Fitness expenditure
Recreation	GE009_7	GE009_7	Entertainment (DVDs, newspapers, books, cinema and bars)
	GE010_2	GE010_2	Long distance traveling expenses
	GE010_6	GE010_8	Beauty (make-up, facials, massages etc.)
	GE009_6	GE009_6	Household items and personal toiletries
Clothing	GE010_1	GE010_1	Clothing and bedding
Education	GE010_9	GE010_5	Education and training
Other	GE009_5	GE009_5	Local transportation
	GE009_4	GE009_4	Fees for matrons, housekeepers and servants
	GE010_8	GE010_12	Taxes and fees turned over to the government
	GE010_14	GE010_13	Donations

Note: All consumption categories provided by the CHARLS are listed in the table. We further categorize them following Meyer (2013).
Source: 2011 and 2013 waves of the CHARLS.

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the above-mentioned consumption aggregates in levels and per capita.[10] Following Coe and Webb (2010) and Rottke and Klos (2016), we focus on both total and non-durable consumption because the latter is likely to be the most responsive to changes in household composition.[11] We add non-education expenditure to investigate the extent to which changes in total/non-durable consumption are driven by changes in education expenditure, once a member of the household's younger generation leaves the household. $YoungMove_{j,t}$ indicates the number of members of the younger generation who moved out of household j between 2011 and 2013.[12,13]

$Controls_{j,t}$ represents a set of control variables. Specifically, following Rottke and Klos (2016), we control for the main respondent's age, marital and health status, as well as for total household financial wealth and home ownership.[14] We also include the number of non-offspring household members,[15] as well as household income, which is defined as the sum of the income of all household members. This comprises salaries, pensions, benefits, and asset revenues of all household members, as well as remittances from non-resident children and grandchildren.[16]

Following Danziger et al. (1982) and Robb and Burbidge (1989) who document that consumption demand decreases with age in the late stages of the life cycle, we expect the sign of the coefficient associated with the main respondent's age to be negative. Compared with singles, married people face less uncertainty in their income and consumption as their partners will support them when they encounter financial problems. Thus, marriage can be regarded as a form of insurance against income and health risks (Yang & De Nardi, 2016). We therefore expect a positive association between the dummy variable indicating that the respondent is married and household consumption. Furthermore, considering the low level of social welfare benefits in China (Cheng et al., 2018b), we expect people with poorer health to incur higher out-of-pocket medical expenditures and hence to exhibit higher consumption. In line with Gan et al. (2010), we expect homeownership to be associated with a higher consumption. Finally, according to the wealth and income effect, people tend to spend more as their income and/or the value of their assets increase. We therefore anticipate a positive sign on the coefficients associated with total household financial wealth, income, and home ownership (Paiella and Pistaferri, 2017).

[10]In addition to consumption per capita, we later focus on adult-equivalent consumption. In this methodological section, and in particular, in Table 3, the two terms are used interchangeably.

[11]It is, however, noteworthy that in our dataset, durable consumption only represents 5.6% of total consumption (see Appendix Table A2 for details).

[12]Given that we use the information of household members in 2011 as the baseline, we do not consider people moving out of a household in that year (i.e., $YoungMove_{j,2011} = 0$).

[13]Due to missing information on children and other household members who moved out before 2011, we are unable to include dummies for each child moving out, as done by Rottke and Klos (2016).

[14]Variables such as gender, education, and a dummy variable for whether the respondent lives in the rural area are not included as they do not vary over time and are therefore cancelled out in the differencing process which characterizes the fixed-effects estimator that we use.

[15]Bertoli and Murard (2020) argue that the departure of household members may lead to further changes in household composition, which may, in turn, also affect consumption. Including the number of non-offspring household members in all our models enables us to indirectly control for the effects of changes of this type involving older household members.

[16]See Appendix Table A1 for definitions of all variables used in our models.

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It is particularly important to include income in our equation as the departure of older offspring may affect household consumption indirectly by affecting household income. Specifically, such departures would reduce the leavers' financial contributions to the household, which may, in turn, affect household consumption. Similarly, children who migrate may send remittances back home, which have been found to supplement income in rural China and increase per capita consumption (Démurger & Wang, 2016). Parents who leave their children behind typically also send remittances back home to help grandparents with the education and upbringing of the children (Secondi, 1997). When they take their children back, they may stop these transfers. All these effects are captured by our household income variable, which includes the salaries of all household members as well as remittances from non-resident household members. As a result, all the effects of the departure of members of the younger generation on the consumption of the remaining household members that we discuss hereafter are net of these changes in income.

The error term in Equation (1) is made up of the following components: u_j, which is a household-specific time-invariant effect often referred to as unobserved heterogeneity; u_t, which accounts for business cycle effects; the interaction between provincial fixed effects (u_p) and time fixed effects (u_t), which is aimed at capturing province-specific business cycle effects; and ε_{jt}, which represents an idiosyncratic error term. To account for the u_j component of the error term, we use a fixed-effects estimator.[17] We report robust standard errors rather than the conventional standard errors to account for potential heteroskedasticity and within-group correlation.

In order to assess how the remaining household members allocate the resources freed up by the leaver, it is necessary to estimate Equation (1) both for household consumption and per capita consumption. Table 3 shows how different coefficients associated with the $YoungMove_{j,t}$ variable in the two equations translate in the freed-up resources being saved and/or consumed.

In a nutshell, if the coefficient associated with $YoungMove_{j,t}$ in the model for per capita consumption is positive, there are three possible scenarios. If the corresponding coefficient in the model for total consumption is also positive, then all the resources freed up by the leaver are consumed and, after the departure, the remaining household members even increase their consumption further compared to the pre-departure period. If the corresponding coefficient in the model for total consumption is not statistically significant, then all freed-up resources are consumed. If it is negative, then part of the freed-up resources is consumed and part is saved.

If the coefficient associated with $YoungMove_{j,t}$ in the model for per capita consumption is negative and the corresponding coefficient in the model for total consumption is also negative, then the freed-up resources are saved and the remaining household members even decrease their overall consumption after the departure compared to the pre-departure period. Finally, if the coefficient associated with $YoungMove_{j,t}$ in the model for per capita consumption is not statistically significant and the corresponding coefficient in the model for total consumption is negative, then all freed-up resources are saved.[18]

[17]We did not include u_p non interacted in the model because households in our sample do not switch province over the sample period. As a result, u_p is dropped in the differencing process associated with the fixed-effects estimation.

[18]As we control for household income in all our regressions, our conceptual framework and results are based on households that faced a similar change in income but different young leaver experiences. In light

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Table 3. Conceptual framework

(1) Total consumption	(2) Per capita consumption	(3) Freed-up resources
+	+	Consumed + extra ↑ in consumption
–	+	Part consumed, part saved
0	+	Consumed
–	–	Saved + extra ↓ in consumption
–	0	Saved

Note: This table reports possible signs of the coefficients associated with number of leavers in the models aimed at explaining total consumption (column 1) and per capita consumption (column 2). Column 3 describes whether according to the combinations of signs in columns 1 and 2, the resources freed up by the leaver are consumed and/or saved.

4.2 Differentiating leavers by age

We next examine the extent to which consumption changes according to the age of the leavers. To this end, we estimate the following equation:

$$\log C_{j,t} = \partial + \gamma_1 YoungMove0_16_{j,t} + \gamma_2 YoungMove17_24_{j,t} + \gamma_3 YoungMove25_30_{j,t} + \gamma_4 YoungMove31+_{j,t} + \delta' Controls_{j,t} + u_j + u_t + (u_p * u_t) + \varepsilon_{j,t} \quad (2)$$

$YoungMove0_16_{j,t}$, $YoungMove17_24_{j,t}$, $YoungMove25_30_{j,t}$, and $YoungMove31+_{j,t}$ represent the number of young leavers in each age group in household j in year t.[19,20] The control variables and components of the error term are the same as in Equation (1). Once again, we estimate Equation (2) both for household consumption and per capita consumption, using a fixed-effects estimator. As in the previous sub-section, in order to assess whether the remaining household members save or consume the resources freed up by the leavers, the coefficients associated with the *YoungMove* variables in the models for per capita consumption need to be interpreted together with those in the models for total consumption.

of this consideration, it is noteworthy that we only draw conclusions as to whether the resources freed up by the leavers are saved or consumed, not on the effects of the departure of a member of the younger generation on the overall saving of the household (which is driven by income changes). Nevertheless, our main results were robust to estimating regressions of the saving rate as a function of the number of leavers/leavers of different ages and control variables, in which the saving rate was defined as the logarithm of the ratio of household income to total non-durable consumption (Chamon & Prasad, 2010; Liu et al., 2023). As the derived saving rate is likely to suffer from significant measurement error (Liu et al., 2023), we decided not to report these results hereafter.

[19]For reasons discussed in footnote 12, $YoungMove0_16_{j,2011} - YoungMove31+_{j,2011}$ are equal to zero, and, therefore, not considered.

[20]Differentiating leavers by age enables us to capture the effects of entire families leaving the household. This is important bearing in mind that among households with a leaver aged under 16, 77.60% have at least two leavers and 65.30% have three leavers. This suggests that people aged less than 16 generally leave together with other family members such as their parents. For example, if a child aged less than 16 leaves together with his/her mother aged 28 and his/her father aged 31, then the overall effect of these departures on the consumption of the left-behind household members is accounted for by the coefficients γ_1, γ_3, and γ_4 in Equation (2).

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5. Results

5.1 Do parents/grandparents use the resources freed up following the departure of a member of the younger generation to increase their consumption?

Table 4 shows the estimates of Equation (1). The dependent variables in columns 1–3 are the logarithms of total household consumption, non-durable consumption, and non-education consumption, respectively. The dependent variables in columns 4–6 are the logarithms of total household consumption per capita, non-durable consumption per capita, and non-education consumption per capita respectively, which are calculated by dividing total, non-durable and non-education consumption by household size. Finally, following Rottke and Klos (2016), the dependent variables in columns 7–9 are the logarithms of total, non-durable and non-education consumption divided by the equivalence scale (EQS).[21]

We can see that whatever the consumption aggregate, household consumption decreases when a household member departs. Specifically, the departure of a member of the younger generation is associated with an 11.91% (column 1), 11.63% (column 2), and 10.41% (column 3) drop in total, non-durable, and non-education consumption, respectively. These findings are consistent with Irvine (1978) who find that household size has a direct effect on household consumption. They are also consistent with Deaton and Paxson (1998) and Deaton et al. (1989) who find that expenditure on food, education, local transportation costs, and personal toiletries increase with the number of household members.

At the same time, the estimates in columns 4–6 (7–9) show a rise in consumption per capita (adult-equivalent consumption) by 16.97, 17.23, and 18.45% (11.19, 11.46, and 12.68%) respectively for total, non-durable, and non-education consumption in association with the departure of an offspring.[22] In accordance with the conceptual framework in Table 3, this suggests that part of the resources freed up by the leaver are consumed and another part is saved.[23] Although consistent with Rottke and Klos (2016) who also find that part of the resources freed up by the leavers are saved by the remaining household members, these findings are opposite to Coe and Webb (2010), and Dushi et al. (2021), who find that parents generally increase their consumption after children move out. This can be explained considering that Chinese people have stronger incentives to save compared to those in the US (Chamon & Prasad, 2010; Cheng et al., 2018b).

In terms of the control variables, consistent with Paiella and Pistaferri (2017), there is a positive relationship between both household financial wealth and income, and

[21]The EQS is calculated as n^{β}, where n is the total number of household members, and β represents the economies of scale in consumption. Following Rottke and Klos (2016), we set $\beta = 0.8$. Our results were robust to the use of different equivalence scales.

[22]As the results for per capita consumption and adult-equivalent consumption are very similar, hereafter, we only report the latter.

[23]Similar results were obtained in consumption models estimated as a function of dummies indicating the presence of one young mover, two young movers, and three or more young movers. In both the specifications for our consumption aggregates in levels and per adult-equivalent, the coefficients associated with the three or more young movers dummy were the highest in absolute value, followed by those associated with the two young movers dummy. The coefficients associated with the one young mover dummy were the smallest. Similar results were also obtained by restricting our sample to households with leavers in one age group only. This suggests that our baseline results are not driven by entire families (e.g., the respondent's grandchild and his/her parents) leaving the household at the same time. These results are not reported for brevity, but available upon request.

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Table 4. Young leavers and household consumption

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total consumption	Non-durables consumption	Non-education consumption	Total consumption per capita	Non-durables consumption per capita	Non-education consumption per capita	Total consumption EQS	Non-durables consumption EQS	Non-education consumption EQS
Age	0.0054	0.0083	0.0031	0.0060	0.0090	0.0037	0.0059	0.0088	0.0036
	(0.0204)	(0.0210)	(0.0201)	(0.0205)	(0.0210)	(0.0202)	(0.0205)	(0.0210)	(0.0202)
Married	0.6268***	0.6135***	0.6227***	0.6058***	0.5938***	0.6015***	0.6100***	0.5977***	0.6058***
	(0.1429)	(0.1408)	(0.1418)	(0.1437)	(0.1417)	(0.1431)	(0.1433)	(0.1413)	(0.1425)
Widowed	0.5381***	0.4594***	0.5533***	0.6289***	0.5486***	0.6452***	0.6108***	0.5308***	0.6269***
	(0.1477)	(0.1452)	(0.1467)	(0.1488)	(0.1463)	(0.1479)	(0.1482)	(0.1457)	(0.1473)
Income	0.0432***	0.0378***	0.0435***	0.0400***	0.0345***	0.0402***	0.0406***	0.0352***	0.0409***
	(0.0085)	(0.0085)	(0.0085)	(0.0086)	(0.0085)	(0.0085)	(0.0086)	(0.0085)	(0.0085)
Wealth	0.0177***	0.0153***	0.0207***	0.0180***	0.0157***	0.0209***	0.0179***	0.0156***	0.0209***
	(0.0040)	(0.0040)	(0.0040)	(0.0040)	(0.0040)	(0.0040)	(0.0040)	(0.0040)	(0.0040)
Home ownership	0.0635	0.0851*	0.0716	0.0533	0.0744	0.0613	0.0553	0.0765	0.0634
	(0.0447)	(0.0477)	(0.0446)	(0.0448)	(0.0474)	(0.0446)	(0.0447)	(0.0474)	(0.0446)
Good health	0.0696	0.0947**	0.0637	0.0661	0.0900*	0.0604	0.0668	0.0909*	0.0611
	(0.0466)	(0.0471)	(0.0465)	(0.0467)	(0.0472)	(0.0467)	(0.0466)	(0.0471)	(0.0466)
Fair health	0.0079	0.0328	−0.0051	0.0074	0.0316	−0.0055	0.0075	0.0319	−0.0054
	(0.0371)	(0.0370)	(0.0374)	(0.0373)	(0.0371)	(0.0376)	(0.0372)	(0.0371)	(0.0375)
YoungMove	−0.1191***	−0.1163***	−0.1041***	0.1697***	0.1723***	0.1845***	0.1119***	0.1146***	0.1268***
	(0.0169)	(0.0181)	(0.0168)	(0.0165)	(0.0177)	(0.0164)	(0.0165)	(0.0177)	(0.0164)
No. of non-offspring members	0.0614	0.0832	0.0791	−0.2409***	−0.2187***	−0.2227***	−0.1805***	−0.1583**	−0.1624**
	(0.0577)	(0.0577)	(0.0574)	(0.0702)	(0.0699)	(0.0702)	(0.0666)	(0.0664)	(0.0666)
Constant	7.8754***	7.6464***	7.8810***	7.3530***	7.1234***	7.3621***	7.4574***	7.2278***	7.4664***
	(1.2507)	(1.2845)	(1.2327)	(1.2549)	(1.2880)	(1.2394)	(1.2535)	(1.2868)	(1.2375)

(*Continued*)

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Table 4. (*Continued.*)

	(1) Total consumption	(2) Non-durables consumption	(3) Non-education consumption	(4) Total consumption per capita	(5) Non-durables consumption per capita	(6) Non-education consumption per capita	(7) Total consumption EQS	(8) Non-durables consumption EQS	(9) Non-education consumption EQS
Obs.	11,640	11,475	11,604	11,640	11,475	11,604	11,640	11,475	11,604
Number of households	6,584	6,557	6,576	6,584	6,557	6,576	6,584	6,557	6,576

Note: All models are estimated using a fixed-effects estimator. See Appendix Table A1 for definitions of all variables. The dependent variables in columns 1–3 are the logarithms of total, non-durable, and non-education household consumption, respectively. The dependent variables in columns 4–6 are the logarithms of total, non-durable, and non-education household consumption per capita, respectively, which are calculated by dividing consumption by the number of household members (c/n). The dependent variables in columns 7–9 are the logarithms of adult-equivalent total, non-durable, and non-education household consumption, respectively, which are calculated by dividing consumption by the equivalence scale ($n^{0.8}$). Year dummies and the interactions between provincial and year dummies are included in all models, but their estimates are not reported for brevity. Robust standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

consumption. Similarly, there exists a strong relationship between the marital status of the main respondent and consumption, which is consistent with Yang and De Nardi (2016). Widows also show a higher consumption than their "never married" counterparts probably because they got used to higher living standards whilst married.

5.2 Does the age of the young leavers make a difference?

The literature on how parents allocate newly freed-up resources following a child's departure (Coe & Webb, 2010; Dushi et al., 2021; Rottke & Klos, 2016) does not take the leavers' age into account. Given the wide range of leavers' ages shown in our dataset (Fig. 5), we next consider the leavers' age by estimating Equation (2).

Table 5 presents estimates of Equation (2), obtained using a fixed-effects estimator. The dependent variables in columns 1–3 are the logarithms of total household consumption, non-durable consumption, and non-education consumption, respectively. The dependent variables in columns 4–6 are the logarithms of adult-equivalent total, non-durable and non-education consumption.

Focusing on columns 1–3, we observe that the coefficients associated with offspring leavers aged 0–24 are negative and statistically significant, regardless of the consumption aggregate. Focusing on column 1, households with a leaver aged 0–16 decrease their consumption by 21.6%. The corresponding figure for households with leavers aged 17–24 is 21.2%. Similar figures are observed in columns 2 and 3 for non-durables, and slightly lower figures (respectively 19.2 and 16.3%) are shown for non-education consumption. The corresponding coefficients in the models for adult-equivalent consumption are not statistically significant (columns 4 to 6).

Taken together, these findings suggest that the remaining household members save the resources freed up by leavers aged 0 to 24 and can be explained as follows. Table 1 shows that 93.82% of offspring who move out between the ages of 0 and 16 are grandchildren of main respondents. Grandparents living with grandchildren typically invested significant amounts in the education and upbringing of their children in the past, and they also spend significant amounts for their resident grandchildren. As a result, these grandparents have a strong motivation to save the freed-up resources when their grandchildren move out, in order to smooth their consumption. As for leavers aged between 17 and 24, Table 1 indicates that 69.49% of them are children of the respondents and 18.15% of them are grandchildren. Most of these leavers will have just completed their education. In fact, Chinese people generally complete their education at an age ranging from 18 (when most graduate from high school) to 24 (a common age for completing Masters degrees). When offspring complete their education and move out of the family home, the household consumption on education will drop sharply. Once again, having spent large amounts on the education of their children/grandchildren, parents/grandparents will be inclined to save the resources freed up by the leaver.

These findings confirm Chinese households' strong preference for high savings (Chamon & Prasad, 2010). Several factors may contribute to this behavior. First, the Chinese culture places a high value on thrift and precautionary saving (He et al., 2018a), which was especially pertinent in the uncertain global economic climate post-crisis. Second, the transition from a planned to a market economy, coupled with an underdeveloped social safety net and a poorly developed financial system, may have increased the necessity for households to self-insure through saving (Chamon & Prasad, 2010; Cheng et al., 2018b). Lastly, rapid aging, changes in family

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Table 5. Young leavers and household consumption differentiating leavers by age

	(1)	(2)	(3)	(4)	(5)	(6)
	Total consumption	Non-durables consumption	Non-education consumption	Total consumption EQS	Non-durables consumption EQS	Non-education consumption EQS
Age	0.00524	0.00841	0.00291	0.00576	0.00896	0.00343
	(0.0204)	(0.0210)	(0.0201)	(0.0205)	(0.0210)	(0.0202)
Married	0.622***	0.606***	0.619***	0.605***	0.590***	0.601***
	(0.143)	(0.141)	(0.142)	(0.143)	(0.141)	(0.142)
Widowed	0.535***	0.454***	0.552***	0.608***	0.526***	0.626***
	(0.148)	(0.146)	(0.147)	(0.149)	(0.146)	(0.148)
Income	0.0442***	0.0393***	0.0444***	0.0417***	0.0367***	0.0418***
	(0.00853)	(0.00844)	(0.00848)	(0.00855)	(0.00846)	(0.00850)
Wealth	0.0176***	0.0152***	0.0206***	0.0178***	0.0155***	0.0209***
	(0.00400)	(0.00400)	(0.00401)	(0.00400)	(0.00399)	(0.00400)
Home ownership	0.0657	0.0898*	0.0731*	0.0578	0.0816*	0.0651
	(0.0445)	(0.0473)	(0.0443)	(0.0445)	(0.0470)	(0.0443)
Good health	0.0697	0.0958**	0.0638	0.0672	0.0923**	0.0613
	(0.0464)	(0.0469)	(0.0464)	(0.0465)	(0.0469)	(0.0465)
Fair health	0.00546	0.0307	−0.00697	0.00524	0.0300	−0.00722
	(0.0372)	(0.0370)	(0.0374)	(0.0372)	(0.0371)	(0.0375)
YoungMove0_16	−0.216***	−0.260***	−0.192***	0.00786	−0.0359	0.0314
	(0.0541)	(0.0616)	(0.0536)	(0.0524)	(0.0597)	(0.0520)
YoungMove17_24	−0.212***	−0.242***	−0.163***	0.0272	−0.00346	0.0761
	(0.0538)	(0.0522)	(0.0504)	(0.0530)	(0.0512)	(0.0502)

(*Continued*)

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Table 5. (*Continued.*)

	(1) Total consumption	(2) Non-durables consumption	(3) Non-education consumption	(4) Total consumption EQS	(5) Non-durables consumption EQS	(6) Non-education consumption EQS
YoungMove25_30	−0.0374 (0.0363)	−0.0259 (0.0379)	−0.0332 (0.0359)	0.190*** (0.0364)	0.201*** (0.0381)	0.194*** (0.0362)
YoungMove31+	−0.0579 (0.0368)	−0.0136 (0.0371)	−0.0570 (0.0367)	0.177*** (0.0371)	0.221*** (0.0376)	0.178*** (0.0372)
No. of non-offspring members	0.0689 (0.0594)	0.0941 (0.0605)	0.0857 (0.0586)	−0.173** (0.0690)	−0.147** (0.0702)	−0.155** (0.0683)
Constant	7.864*** (1.253)	7.610*** (1.287)	7.878*** (1.234)	7.443*** (1.255)	7.189*** (1.288)	7.457*** (1.238)
Obs.	11,640	11,475	11,604	11,640	11,475	11,604
Number of households	6,584	6,557	6,576	6,584	6,557	6,576

Note: All models are estimated using a fixed-effects estimator. See Appendix Table A1 for definitions of all variables. The dependent variables in columns 1–3 are the logarithms of total, non-durable, and non-education household consumption, respectively. The dependent variables in columns 4–6 are the logarithms of adult-equivalent total, non-durable, and non-education consumption, respectively, which are calculated by dividing consumption by the equivalence scale ($n^{0.8}$). Year dummies and the interactions between provincial and year dummies are included in all models, but their estimates are not reported for brevity. Robust standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

structure due to the one-child policy, and rising housing prices are other key factors which can explain Chinese people's tendency to save a large share of their disposable income (Chamon & Prasad, 2010; Zhou, 2014).

By contrast, in columns 1–3 of Table 5, we observe that the coefficients associated with leavers aged 25 and over are not statistically significant, while they are positive and highly significant in the adult-equivalent consumption models (columns 4–6). For instance, focusing on column 4, we observe that households with offspring leavers aged between 25 and 30 increase their total adult-equivalent consumption by 19.0% following the departure of members of the younger generation. The corresponding figure for offspring leavers aged above 30 is 17.7%. Similar patterns are observed for non-durable and non-education consumption in columns 5 and 6. Overall, these results suggest that the remaining household members consume the resources freed up by the leaver. This can be explained bearing in mind that children in this age group who move out of the household have more wealth than those still residing with their parents and, as such, can provide a source of risk-sharing for their parents.[24] In China, financially independent children are in fact responsible for providing financial and physical support to their dependent parents (Chen et al., 2019; Zhang, 2019; Zhang & Harper, 2022). They are especially important when their parents have to pay unexpected large amounts of money, such as medical expenses. Therefore, children can be regarded as a form of insurance. Gourinchas and Parker (2002) find evidence that income increases with age during the early working life. In the Chinese context, this implies that the older the children, the stronger their financial capability and their subsequent ability to assist their parents financially. In other words, the reimbursement rate of this special type of insurance (children) increases with the age of the children. Thus, parents with older and independent children face less income uncertainty and, in turn, less need to save for precautionary reasons. This can explain why they tend to consume a larger proportion of the resources freed up when an older child leaves the family home.

6. Further tests

6.1 Robustness tests

We conduct a set of robustness tests. First, Appendix Table A5 shows that our baseline results are robust to using a weighted fixed-effects estimator. Second, Appendix Table A6 shows that they hold when using a balanced panel.[25] Both these exercises enable us to conclude that our main findings are not driven by attrition. Third, Appendix Table A7 shows that our results are robust to dropping members of the younger generation who passed away or left the household for reasons other than moving out.

Fourth, so far we have looked at the determinants of total, non-durable, and non-education consumption. One may wonder whether the results also hold for specific consumption categories. However, as durable and education consumption are

[24]As Chinese students generally complete their college education at 22–24, we expect them to have landed a permanent job by the age of 30.

[25]Our sample contains households that participated in both the 2011 and the 2013 waves of the CHARLS. Yet, missing values for some variables used in our analysis resulted in an unbalanced sample, encompassing 11,640 observations for 6,584 households (for the specifications relating to total consumption).

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respectively characterized by 61.05 and 72.39% zero values, we are not able to estimate their determinants using a fixed-effects linear estimator. A Tobit estimator should be used in this case, but fixed effects cannot be accounted for due to the incidental parameter problem. In Appendix Table A8, we therefore verify whether our results are robust to focusing on two other consumption aggregates, namely out-of-pocket medical expenditure and "other" expenditure, which either have few or no zero values. The former represents an important share (13.44%) of the total consumption of the respondents in our dataset, is essential expenditure, and closely depends on household composition. The latter is a miscellaneous category which includes diverse items such as local transportation; fees for matrons, housekeepers, and servants; taxes and fees turned over to the government; donations and so on. We can see that our main results hold for these two sub-categories of consumption, with one exception: neither total nor adult-equivalent out-of-pocket medical expenditure are affected by movers aged 25–30. This can be explained bearing in mind that respondents in this age group are generally healthy and may only free up a small amount of resources.[26]

6.2 Differentiating households based in rural and urban areas

As households living in rural areas may be very different from households based in urban areas, we have conducted separate analyses for households based in the two areas. The results are presented in Tables 6 and 7. In both Tables, the dependent variables in columns 1–3 are the logarithms of total household consumption, non-durable consumption, and non-education consumption, respectively. The dependent variables in columns 4 to 6 are the logarithms of total, non-durable and non-education adult-equivalent consumption.

For movers aged 0–30, these Tables show broadly similar results in urban and rural areas, which are also very similar to the baseline results. Specifically, we observe negative coefficients associated with the number of leavers aged 0–24 in the models for total, non-durable, and non-education consumption, coupled with insignificant coefficients in the corresponding regressions for adult-equivalent consumption. This suggests that the remaining household members save the resources freed up by the leavers. Focusing on the leavers aged 25–30, we observe positive coefficients associated with the adult-equivalent consumption aggregates and insignificant coefficients associated with the total aggregates. This suggests that the remaining household members consume the resources freed up by these leavers.

The Tables highlight, however, one difference between rural and urban areas. In rural areas, leavers aged 31 or more are associated with a higher adult-equivalent consumption of the left-behind household members (columns 4–6), coupled with an unchanged total consumption (columns 1–3). This suggests that regardless of the consumption aggregate considered, the remaining household members consume the resources freed up by the leaver. Yet, in urban areas, the results show negative (albeit only marginally significant) coefficients associated with these same leavers in

[26]Our results were also robust to using a variable consumption aggregate, defined as total expenditure on food, medical products and services, recreation, clothing, education, and other expenditure as our left-hand-side variable. This ensures that our baseline results are not driven by increases in fixed consumption per capita, which are not welfare-enhancing. These results are not reported for brevity, but available on request.

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Table 6. Young leavers and household consumption differentiating leavers by age; urban sample

	(1) Total consumption	(2) Non-durables consumption	(3) Non-education consumption	(4) Total consumption EQS	(5) Non-durables consumption EQS	(6) Non-education consumption EQS
Age	0.0030 (0.0288)	0.0030 (0.0294)	−0.0008 (0.0284)	0.0040 (0.0288)	0.0041 (0.0294)	0.0003 (0.0284)
Married	0.3668* (0.2203)	0.3705* (0.2151)	0.3889* (0.2199)	0.3225 (0.2208)	0.3287 (0.2156)	0.3444 (0.2204)
Widowed	0.4225* (0.2306)	0.3605* (0.2185)	0.4201* (0.2315)	0.4753** (0.2309)	0.4106* (0.2187)	0.4731** (0.2318)
Income	0.0445*** (0.0144)	0.0447*** (0.0142)	0.0469*** (0.0144)	0.0415*** (0.0144)	0.0414*** (0.0142)	0.0439*** (0.0144)
Wealth	0.0161*** (0.0057)	0.0133** (0.0057)	0.0188*** (0.0056)	0.0161*** (0.0057)	0.0136** (0.0057)	0.0188*** (0.0056)
Home ownership	0.1037 (0.0679)	0.1428* (0.0799)	0.1217* (0.0673)	0.0975 (0.0681)	0.1338* (0.0788)	0.1154* (0.0677)
Good health	0.0932 (0.0745)	0.0737 (0.0739)	0.0681 (0.0752)	0.0911 (0.0746)	0.0694 (0.0740)	0.0660 (0.0752)
Fair health	0.0049 (0.0553)	0.0190 (0.0535)	−0.0139 (0.0569)	0.0089 (0.0552)	0.0216 (0.0535)	−0.0099 (0.0568)
YoungMove0_16	−0.2346** (0.0994)	−0.2538** (0.0997)	−0.2046** (0.0985)	−0.0005 (0.0962)	−0.0188 (0.0967)	0.0294 (0.0954)
YoungMove17_24	−0.2274** (0.0897)	−0.2346** (0.0915)	−0.1831*** (0.0706)	0.0347 (0.0874)	0.0267 (0.0890)	0.0789 (0.0706)

(*Continued*)

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Table 6. (*Continued.*)

	(1) Total consumption	(2) Non-durables consumption	(3) Non-education consumption	(4) Total consumption EQS	(5) Non-durables consumption EQS	(6) Non-education consumption EQS
YoungMove25_30	−0.0118 (0.0616)	−0.0077 (0.0621)	0.0032 (0.0617)	0.2285*** (0.0632)	0.2319*** (0.0634)	0.2435*** (0.0638)
YoungMove31+	−0.1244* (0.0663)	−0.1241* (0.0657)	−0.1338** (0.0655)	0.1175* (0.0662)	0.1193* (0.0661)	0.1080* (0.0656)
No. of non-offspring members	−0.0157 (0.0760)	0.0140 (0.0748)	−0.0369 (0.0750)	−0.2454*** (0.0898)	−0.2143** (0.0869)	−0.2656*** (0.0927)
Constant	8.6062*** (1.7493)	8.4828*** (1.7879)	8.7342*** (1.7267)	8.1755*** (1.7494)	8.0548*** (1.7867)	8.3021*** (1.7282)
Obs.	4,362	4,292	4,348	4,362	4,292	4,348
Number of households	2,477	2,467	2,474	2,477	2,467	2,474

Note: All models are estimated using a fixed-effects estimator. See Appendix Table A1 for definitions of all variables. The dependent variables in columns 1–3 are the logarithms of total, non-durable, and non-education household consumption, respectively. The dependent variables in columns 4–6 are the logarithms of adult-equivalent total, non-durable, and non-education consumption, respectively, which are calculated by dividing consumption by the equivalence scale ($n^{0.8}$). Year dummies and the interactions between provincial and year dummies are included in all models, but their estimates are not reported for brevity. Robust standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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Table 7. Young leavers and household consumption differentiating leavers by age; rural sample

	(1) Total consumption	(2) Non-durables consumption	(3) Non-education consumption	(4) Total consumption EQS	(5) Non-durables consumption EQS	(6) Non-education consumption EQS
Age	0.0049 (0.0286)	0.0131 (0.0295)	0.0049 (0.0287)	0.0052 (0.0287)	0.0134 (0.0297)	0.0052 (0.0289)
Married	0.7954*** (0.1814)	0.7739*** (0.1802)	0.7661*** (0.1798)	0.8005*** (0.1801)	0.7802*** (0.1795)	0.7707*** (0.1794)
Widowed	0.6068*** (0.1906)	0.5395*** (0.1944)	0.6377*** (0.1880)	0.6961*** (0.1900)	0.6288*** (0.1944)	0.7281*** (0.1878)
Income	0.0429*** (0.0107)	0.0367*** (0.0107)	0.0418*** (0.0106)	0.0403*** (0.0107)	0.0342*** (0.0106)	0.0392*** (0.0106)
Wealth	0.0186*** (0.0055)	0.0170*** (0.0056)	0.0215*** (0.0056)	0.0190*** (0.0055)	0.0174*** (0.0055)	0.0218*** (0.0056)
Home ownership	0.0458 (0.0586)	0.0603 (0.0591)	0.0460 (0.0587)	0.0371 (0.0586)	0.0529 (0.0590)	0.0372 (0.0586)
Good health	0.0494 (0.0595)	0.0969 (0.0604)	0.0517 (0.0591)	0.0467 (0.0596)	0.0940 (0.0605)	0.0490 (0.0592)
Fair health	−0.0034 (0.0495)	0.0268 (0.0500)	−0.0120 (0.0493)	−0.0053 (0.0497)	0.0250 (0.0501)	−0.0140 (0.0495)
YoungMove0_16	−0.1860*** (0.0643)	−0.2382*** (0.0766)	−0.1642** (0.0637)	0.0331 (0.0625)	−0.0186 (0.0744)	0.0549 (0.0621)
YoungMove17_24	−0.2139*** (0.0658)	−0.2537*** (0.0630)	−0.1596** (0.0647)	0.0173 (0.0651)	−0.0240 (0.0620)	0.0713 (0.0645)

(*Continued*)

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Table 7. (*Continued.*)

	(1) Total consumption	(2) Non-durables consumption	(3) Non-education consumption	(4) Total consumption EQS	(5) Non-durables consumption EQS	(6) Non-education consumption EQS
YoungMove25_30	−0.0568 (0.0454)	−0.0424 (0.0480)	−0.0581 (0.0449)	0.1648*** (0.0453)	0.1794*** (0.0481)	0.1635*** (0.0449)
YoungMove31+	−0.0387 (0.0438)	0.0214 (0.0438)	−0.0351 (0.0439)	0.1946*** (0.0444)	0.2541*** (0.0446)	0.1981*** (0.0446)
No. of non-offspring members	0.1241 (0.0833)	0.1487* (0.0868)	0.1717** (0.0809)	−0.1269 (0.0985)	−0.1030 (0.1032)	−0.0790 (0.0956)
Constant	7.5118*** (1.7605)	6.9589*** (1.8195)	7.3665*** (1.7678)	7.0929*** (1.7699)	6.5398*** (1.8291)	6.9487*** (1.7820)
Obs.	7,278	7,183	7,256	7,278	7,183	7,256
Number of households	4,107	4,090	4,102	4,107	4,090	4,102

Note: All models are estimated using a fixed-effects estimator. See Appendix Table A1 for definitions of all variables. The dependent variables in columns 1–3 are the logarithms of total, non-durable, and non-education household consumption, respectively. The dependent variables in columns 4–6 are the logarithms of adult-equivalent total, non-durable, and non-education consumption, respectively, which are calculated by dividing consumption by the equivalence scale ($n^{0.8}$). Year dummies and the interactions between provincial and year dummies are included in all models, but their estimates are not reported for brevity. Robust standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

columns 1–3, coupled with positive coefficients for the adult-equivalent aggregates (columns 4–6), which indicates that the remaining household members consume only part of the resources freed up by the leaver and save the rest. This difference between rural and urban areas could be explained bearing in mind that parents with leavers aged 31 and above are typically older and realize that they may need more help and support both financially and in-kind going forward. Whilst in rural areas, due to tighter social networks, support can be more easily obtained from friends, neighbors, and relatives living outside the household, this may be more difficult in big cities, which could then trigger a tendency of left-behind household members to save part of the resources freed up by the leaver for precautionary reasons. Another reason why households with leavers aged 31 or above may save part of the resources freed up by the leaver in urban areas, but not in rural areas may be that pension payments are a larger concern for urban households due to persistent increases in living expenses. By contrast, they are less of an issue in rural areas where many residents rely on self-sufficient agriculture (Zhang et al., 2018).

6.3 Propensity score matching (PSM)

The key challenge of evaluating the causal link between the departure of offspring and the consumption of the left-behind household members is to make sure any changes in consumption are due to the departure of the offspring and would not have occurred without that departure. However, in real life, it is impossible to observe the outcome in the absence of the event. Hence, although we make use of panel estimators and control for a wide variety of individual- and household-specific characteristics in our models, which help alleviate the endogeneity concerns arising from omitted variable bias, our findings so far do not necessarily reflect causal relationships between leavers and household consumption.[27]

To better understand the links between the departure of members of the younger generation and consumption of the remaining household members, we make use of PSM (Rosenbaum & Rubin, 1983). PSM is a technique that mimics randomization in an observational data set by creating two groups (a treatment and a control group) that are comparable on observed characteristics. As a result, bias attributable to confounding is significantly reduced and selection bias is alleviated.

6.3.1 Methodological considerations

We first estimate Probit regressions to assess the probability of having at least one young leaver in a given age range (i.e., the probability of being treated) as a function of all control variables used in the baseline models evaluated in 2011. Fitted values from these regressions give the propensity scores, which are used to identify households in the control group (i.e., households who share the same characteristics as the treated households, but do not have young leavers) and form the basis of our matching.

Second, we use the one-to-one nearest neighbor matching with replacement, which matches each treated household with the control unit which is closest in terms of propensity score (Rosenbaum & Rubin, 1983). When matching with replacement,

[27]Our results could be interpreted in a causal way only under the assumption of strict exogeneity of move-outs. Rottke and Klos (2016) deal with this problem by using exogenous variation from child deaths. We were unable to adopt a similar strategy, as very few of the members of the younger generation in our sample passed away.

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comparison units can be used as matches more than once if necessary.[28] We use the caliper matching method, in which caliper refers to the difference in the predicted probabilities between the treated and control households. We match within a caliper of 1%.

Third, following Rottke and Klos (2016), we define the average treatment effect of the treated (*ATT*) as follows:

$$ATT = E(Y_1 - Y_0|D = 1) = E(Y_1|D = 1) - E(Y_0|D = 1) \quad (3)$$

where Y represents changes in adult-equivalent consumption between 2011 and 2013; the subscripts 1 and 0 refer to households with and without leavers in the age group considered, respectively; and $D = 1$ denotes the presence of leavers in that age group. At the household level, the first term on the right-hand side of Equation (3) represents the change in adult-equivalent consumption of household X, which has young leavers in the given age range. The second term represents the counterfactual: it measures what the change in adult-equivalent consumption of a household with young leavers in a given age bracket would have been had this household not had leavers. As this counterfactual is unobservable for household X, we seek an alternative household, Z (taken from the control group), with the same characteristics as household X, and observe their change in adult-equivalent consumption. In other words, we use this as a surrogate outcome for household X's counterfactual outcome. Extending this to a group level enables us to calculate the ATTs.[29]

In our context, the ATTs are defined as the expected differences in changes in adult-equivalent consumption over the period 2011–2013 between the treated and the control group.[30] Any observed difference can be attributed to the departure of offspring in the age range considered. In other words, the ATTs represent the effect of experiencing the departure of a member of the younger generation in a given age range on changes in adult-equivalent consumption for households who actually experienced the departure.[31]

6.3.2 Balancing tests

A series of *t*-tests suggest that, despite the relatively large size of our sample, for almost all our conditioning variables, the null hypothesis of no difference in means between treated and matched controls after matching could not be rejected. This is reassuring

[28]Dehejia and Wahba (2002) show that matching with replacement reduces bias compared to matching without.

[29]In all cases, we impose the common support condition. This improves the quality of the matches used to estimate the ATTs (Becker & Ichino, 2002). Only a small number of observations do not satisfy this condition.

[30]All results were robust to using per capita instead of adult-equivalent consumption. We perform the PSM analysis only on the models for adult-equivalent/per capita consumption for the following reason. Our treatment group contains households with at least one offspring leaver in a given age group. Our control group includes households with no young leavers. As there may be multiple leavers within an age group, the difference in changes in total consumption between households in the treatment and the control group could be caused by the number of leavers in each age group, in addition to the age of the leavers. Focusing on adult-equivalent/per capita consumption enables us to purge the effects of multiple leavers within each age group and to only focus on the effects of the age of the leavers, which is what we are interested in.

[31]Focusing on the changes in adult-equivalent consumption for the treated and control observations removes any variation in time-invariant unobserved characteristics between the two groups.

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as the *t*-tests are heavily dependent on sample size (Imbens & Wooldridge, 2009). We can therefore conclude that the quality of our matching is good. These *t*-tests are not reported for brevity but are available upon request.

6.3.3 Results

We report the ATTs for households with leavers in various age groups in Table 8. Columns 1–3 respectively refer to changes in adult-equivalent total, non-durable, and non-education consumption. All results are broadly consistent with our previous findings. They suggest that only households with leavers aged 25 and above show statistically significant and positive ATTs. In other words, regardless of how consumption is measured, compared to similar households with no leavers, only households with leavers aged 25–30 and above 30 show a statistically significant premium in adult-equivalent consumption growth, which is likely due to the departure of the offspring(s). In all specifications, the latter households always show the highest ATTs. By contrast, households with leavers younger than 25 show statistically insignificant ATTs.

7. Do households increase remittances towards non-resident offspring after the departure of a member of the younger generation?

The household consumption analyzed so far does not include households' remittances to non-resident relatives. It is, however, possible that to provide financial assistance to those offspring who departed from home, rather than either save for retirement or consume the freed-up resources, the main respondents opt to transfer these freed-up resources to their offspring leavers, especially in the early stage of their departure (Biggs et al., 2021).

To see whether this is the case, we examine whether household remittances directed towards non-resident children and grandchildren increase after a member moves out from the family home. To this end, we estimate a model of the logarithm of real remittances towards non-resident children and grandchildren as a function of dummies denoting the moving-out of different members of the household's younger generation and control variables.[32] Specifically, following Xie and Zhu (2009), Murphy et al. (2018), and Biggs et al. (2021), our models control for age, education, gender, health and marital status of the main respondent, as well as for household income and financial wealth. We also include a dummy equal to 1 if the main respondent is a homeowner, and 0 otherwise. Provincial dummies and the number of non-offspring household members are also included in our models. Because remittances are censored at 0, we use a Tobit estimator. The results are reported in

[32]These remittances encompass both monetary (e.g., support with living expenses, support in paying bills and so on) and in-kind support (e.g., providing food, clothes, vegetables and so on). Only three types of outward remittances are considered in the CHARLS: those directed towards children and grandchildren; those directed towards parents and parents-in-law; and those directed towards others. We consider remittances directed toward children and grandchildren as a proxy for remittances directed toward members of the younger generation. Clearly, these remittances will, to some extent, understate the total remittances directed toward members of the younger generation who moved out of the household, as they do not include remittances directed toward children-in-law. Yet, Figure 4 shows that children and grandchildren make up more than 70% of total family leavers, whilst children-in-law make up only 16.79% of total family leavers. Also note that remittances directed toward children and grandchildren amount on average to 1,019 Yuan in 2013, which represents 51% of total remittances.

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Table 8. Average treatment effects on the treated (ATTs)

	(1) Change in total consumption EQS	(2) Change in non-durables consumption EQS	(3) Change in non-education consumption EQS
YoungMove0_16	0.040 (0.176)	0.213 (0.185)	0.175 (0.177)
YoungMove17_24	0.108 (0.118)	0.109 (0.102)	0.095 (0.110)
YoungMove25_30	0.168* (0.093)	0.202** (0.091)	0.316*** (0.091)
YoungMove31+	0.494*** (0.120)	0.430*** (0.116)	0.419*** (0.126)

Note: This table reports the ATTs together with their standard errors. These are obtained using PSM with one-to-one nearest-neighbor matching and caliper of 1%. Columns 1–3 respectively refer to changes in adult-equivalent total, non-durable, and non-education consumption, calculated by dividing total, non-durable, and non-education consumption by the equivalence scale ($n^{0.8}$). See Appendix Table A1 for definitions of all variables. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 9.[33] In column 1, the leavers are differentiated by age, whilst in column 2, they are not.

Focusing on column 1, we can see that for all age groups of young leavers, the moving out of a member of the younger generation is not significantly associated with changes in remittances directed towards non-resident children and grandchildren. In column 2, we use the total number of members of the younger generation who move out (*YoungMove*) as the key explanatory variable. As before, the results show that households do not increase their remittances to non-resident offspring after their departure. These findings, which are consistent with Biggs et al. (2021), suggest that parents/grandparents do not transfer the resources freed up when the children and grandchildren move out to the leavers as a type of further financial support.

Focusing on the coefficients associated with the control variables, columns 1 and 2 of Table 9 show an inverse U-shaped relationship between the age of the main respondent and the amount of outward remittances to the younger generations. In addition, there is a strong positive relationship between education and household outward remittances, which implies that residents who have completed primary education support non-resident relatives to a greater extent when compared to their less educated counterparts. Compared with single people, married people tend to have a larger extended family, leading to a positive relationship between marital status and outward remittances. Finally, our results show that household income and wealth are positively related to outward remittances. In China, due to the poorly developed financial system, relatives and friends are the main sources of funding for households

[33]These regressions are only based on the 2013 wave of the CHARLS as there is a discrepancy in the way transfer data are coded in the 2011 and 2013 waves of the CHARLS.

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Table 9. Young leavers and remittances directed to non-resident members of the younger generation (2013)

	(1)	(2)
Age	0.105 (0.0695)	0.124* (0.0681)
Age^2	−0.00106** (0.000536)	−0.00120** (0.000527)
Primary ed.	0.225* (0.119)	0.219* (0.119)
Gender	−0.0476 (0.114)	−0.0493 (0.114)
Married	1.857*** (0.417)	1.850*** (0.417)
Widowed	1.604*** (0.418)	1.598*** (0.417)
Income	0.426*** (0.0451)	0.427*** (0.0450)
Wealth	0.141*** (0.0187)	0.142*** (0.0187)
Home ownership	−0.159 (0.165)	−0.161 (0.165)
Good health	−0.0579 (0.212)	−0.0617 (0.212)
Fair health	0.155 (0.196)	0.154 (0.196)
YoungMove0_16	0.103 (0.168)	
YoungMove17_24	−0.125 (0.177)	
YoungMove25_30	−0.0271 (0.141)	
YoungMove31+	0.124 (0.125)	
No. of non-offspring members	−0.0887 (0.171)	−0.0911 (0.171)
YoungMove		0.0538 (0.0549)
Obs.	4,783	4,783

Note: The dependent variable in both columns is the remittances directed towards non-resident members of the younger generation. The equation is estimated using a Tobit estimator, and marginal effects are reported, with standard errors in parentheses. Provincial dummies are included in all models, but their coefficients are not reported for brevity. See Appendix Table A1 for definitions of all variables. ***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively.

(Zhou, 2014). As a result, households with high wealth typically provide more financial assistance to their non-resident younger relatives.

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8. Conclusion

Based on a panel of 6,548 middle-aged and elderly households taken from the CHARLS over the period 2011–2013, we investigate how the remaining household members deal with the resources freed up after the departure of members of the younger generation. We find that, on average, the remaining household members save part of the resources freed up by the leaver and consume another part. Although broadly consistent with Rottke and Klos's (2016) findings for Germany and Italy, this result is opposite to Coe and Webb (2010) and Dushi et al. (2021), who document that in the US, parents generally increase their consumption after children move out.

Next, we find that the reallocation of the resources freed up by the leavers closely depends on the leavers' age. Specifically, if the leavers are aged 24 or below, the remaining household members save all the freed-up resources. By contrast, if the offspring leavers are aged above 24, the remaining household members spend the freed-up resources. Our results are robust to the use of different specifications, different consumption aggregates, and different estimation methods including PSM. Finally, we find no evidence that parents/grandparents transfer the resources freed up when the children/grandchildren move out to the leavers as further financial support.

Our study suffers from a number of limitations. First, although we make use of panel data techniques which allow us to efficiently control for unobserved, time-invariant factors, and although we include a large number of time-varying covariates, as well as time-varying provincial fixed effects to mitigate the omitted variable bias problem, we cannot categorically interpret our results as causal. This is because, we are simply not able to control for all confounding variables, many of which may be unobservable largely due to data limitations or to the inherent complexity in quantifying them. One such example is the quality of the relationship between household heads and their offspring, which could influence the likelihood of the offspring leaving the household as well as household consumption patterns (due to potential variation in the household head's willingness to invest in the child). The inability to fully account for some potentially relevant variables might introduce endogeneity, which limits the causal interpretation derived from our fixed-effects estimates. Yet, our results are robust to using a PSM approach, which alleviates bias attributable to confounding and selection bias.

Second, our work does not explicitly consider the reasons for the departure of a member of the younger generation, as these are not recorded in our dataset. Yet, the effects of the departure on the consumption of the remaining household members could differ depending on whether the person leaves for work-related reasons, to migrate with parents, and so on. Although we do not explicitly consider these heterogeneities, we believe that accounting for the leavers' age is a sufficient approximation, with younger leavers more likely to leave to join their parent migrants and older leavers more likely to depart for work-related reasons.

Finally, the CHARLS only considers people aged 45 and over, and the mean age of the respondents in our sample is 61. Yet, in rural China, some young people may choose to migrate to and begin to work in cities after they graduate from junior or senior middle school, i.e. when they are between 16 and 18. For households with these types of leavers, the parents are likely to be aged under 45. We therefore miss this type of dynamics. However, using a sample made up of older people enables us to consider the effects of the departure of grandchildren, in addition to that of children and children-in-law. We believe this is particularly important considering

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that around 40% of children in China are taken care of by their grandparents (Deng & Tong, 2020).

Our finding that households with younger leavers tend to save the resources freed up by the leavers confirms the strong saving motivations characterizing Chinese households. This could, in turn, be explained by the low level of social welfare benefits and poorly developed financial markets, which require Chinese people to appropriately diversify income and consumption risks (Chamon & Prasad, 2010; Cheng et al., 2018b). Along with an ageing population, the pension scheme deficit is likely to increase, putting extra stress on Chinese residents to save even more. This is problematic as China aims at rebalancing the country's economic growth away from investment and exports and toward domestic consumption (Cao et al., 2020). This aim has arisen following the decline in global demand associated with the 2008–2009 financial crisis. It has become even more pronounced in recent years as a result of the trade tensions between China and the US. To alleviate the need for such high levels of saving and fuel domestic consumption, the government should put in place mechanisms aimed at further developing the pension system and incentivizing financial institutions to provide more diversified products. Also, the government could endeavour to improve financial literacy amongst its citizens and advise households on how to utilize financial markets appropriately, especially with respect to private pension schemes or other financial instruments which could be used to supplement the insufficient state pension.

Our finding that the remaining household members increase their consumption following the departure of their newly independent adult offspring may indicate a potential market opportunity, whereby businesses could design products specifically tailored to the needs and preferences of older adults, aiming to stimulate further consumption. Moreover, if the departure of adult children from the household indeed stimulates consumption among older adults, government initiatives that support young adults' independence (like affordable housing or diverse job creation) might indirectly boost older adults' consumption, providing an important additional trigger for increasing domestic demand and stimulating economic growth.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/dem.2024.8.

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