THE IMPACT OF INHERITANCE ON THE DISTRIBUTION OF WEALTH: EVIDENCE FROM CHINA

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Using the China Health and Retirement Longitudinal Study, we investigate household inheritances' structural characteristics and their effects on wealth distribution. First, we find that the proportion of households receiving inheritances in China is slightly lower than that of some European countries and the United States, and the inheritance scale, especially the proportion of inheritances in household net worth, is much lower. Second, inheritances can significantly promote wealth accumulation, and wealthy households are more likely to receive larger-scale inheritances. Therefore, inheritances can aggravate class stratification and reduce social mobility. Third, inheritances reduce relative wealth inequality but widen the absolute wealth gap. This effect's duality is that although wealthy households have inheritances on a larger scale, the relative importance of the inheritance is more significant for poorer households, who inherit more relative to their household net worth. Altruistic motivations of inheritance donors can help explain this phenomenon.

JEL Codes: D31, E01, D10

Keywords: inheritance, wealth inequality, inheritance saving function, China health and retirement longitudinal study

1. INTRODUCTION

The sustained and rapid economic growth has made the scale of household wealth grow continually in China. However, problems such as wealth inequality and class stratification have also become increasingly prominent. Studies have shown that the Gini coefficient of household net worth in China increased rapidly from 0.54 in 2002 to 0.74 in 2010 (Li and Wan, 2015). The wealth share held by the top 10 percent of the population rose from 40 percent in 1995 to 67 percent in 2015, while the wealth share held by the middle 40 percent and the bottom

50 percent continued to decline (Piketty *et al.*, 2019). The Credit Suisse Research Institute also noted in its Global Wealth Databook 2018 that the Gini coefficient of the household net worth in China in 2018 had reached 0.79 (Shorrocks *et al.*, 2018), making China a country with one of the most highly unequal wealth distributions globally. In other countries, wealth inequality progressed over decades or even centuries, whereas it took only 2–3 decades years in China to reach this high level. This factor has attracted significant attention from government departments and academia. Academic circles have mainly analyzed the influence of factors such as high housing prices, portfolio choices, income fluctuations, and other personal and household characteristics on the formation of household wealth inequality in China (Meng, 2007; Xie and Jin, 2015; Wei *et al.*, 2019). The impacts of inheritances on the formation of wealth inequality in China have been rarely studied.

It is widely believed that inheritances play a vital role in forming wealth inequality, especially at the top of the wealth distribution. In European countries and the United States after World War II, technological progress, economic growth, and open competition reduced the inequality among different social strata. However, wealth inequality showed an upward trend in some countries after the 1980s (Roine and Waldenstrom, 2010). Interestingly, the proportions of inheritances and gifts as part of the national income during the same period also increased, indicating that inheritances were becoming increasingly important in wealth accumulation in some European countries and the United States (Piketty, 2011; Ohlsson *et al.*, 2020). However, the accumulation of wealth in China mainly began after its reform and opening up during the 1980s. Individuals who accumulated enormous wealth remain alive, making the total amount of inheritance relatively small. Simultaneously, rapid economic growth allows individuals to accumulate a large amount of wealth during their lifetimes, effectively reducing their relative share of the inheritance.

Figure 1 shows the scale of inheritance and the ratio of inheritance to the net wealth of sample households in different birth years estimated based on the data from the China Health and Retirement Longitudinal Study (CHARLS) data. It can be seen from the figure that the inheritance scale and ratio of inheritances to net wealth gradually increased with the respondents' birth years (i.e., the ages gradually decreased). Since one's birth year can reflect generational information, the closer the birth year to the present, the more the large-scale inheritance received in recent years. Therefore, Figure 1 indirectly indicates that the inheritance scale received by Chinese households is increasing over time and that the proportion of inheritances to net wealth is also increasing. In the near future, a large number of people who accumulated considerable wealth from market reforms will enter old age. These individuals are bound to leave enormous inheritances; therefore, the inheritance scale and proportion are likely to increase further.

Moreover, China has not yet started to collect inheritance tax and gift tax. Nevertheless, inheritance tax has been put on the agenda by the government repeatedly since the 1990s. In 1990, the State Taxation Administration put forward the *General Assumptions on the Industrial and Commercial Tax System Reform in the Next Ten Years*, which formally proposed the idea of inheritance tax and gift tax. In 1996, "the gradual collection of inheritance tax and gift tax" was included in the *National "Ninth Five-Year Plan" and Perspective Target of 2010*. In March
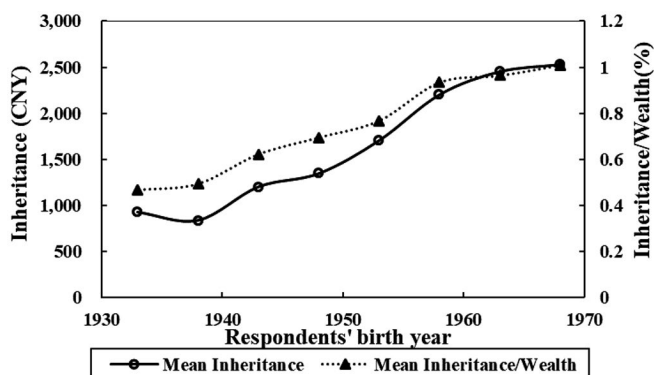
Figure 1. Absolute and Relative Size of Inheritance by Respondents' Birth Year

2001, the *Tenth Five-Year Plan for National Economic and Social Development* proposed that inheritance tax should be collected timely. In February 2013, the timely collection was again mentioned in the document on income distribution reforms jointly issued by the National Development and Reform Commission and relevant departments. However, after 2013, although scholars still called for the collection of inheritance tax, it almost disappeared in government documents. So far, relevant acts on inheritance tax have not been introduced. This is due to some objections from government departments, society, and academic circles, which are reflected in three aspects: First, it is believed that the inheritance tax system is not conducive to improving economic efficiency but may affect investment enthusiasm. Second, there are concerns that inheritance tax may cause a large-scale outflow of capital. Third, it is believed that the scale of inheritance tax is small. Inheritance tax has little practical significance to fiscal revenue considering taxation costs. Simultaneously, in China, individual income tax and other related redistribution policies are not yet complete. It is challenging to regulate the increasing economic inequality of the entire society effectively. Therefore, it is necessary to take pre-cautions and use the limited data available to fully explore the current status of inheritances and the impact of inheritances on wealth distribution.

Based on the factors above, this study uses the CHARLS data to analyze the distribution characteristics of Chinese household inheritances and their influence on the accumulation and inequality of household wealth. This paper's contributions are twofold: First, this study focused on analyzing the influence of inheritances on the accumulation and inequality of household wealth in China. The existing literature on the impact of inheritances on wealth accumulation and inequality is concentrated in developed countries. As the largest and fastest-growing developing economy, China still lacks relevant research. Moreover, before 1978, wealth and inheritance are strictly restricted in China. It is crucial to analyze how wealth distribution and inheritance have developed in a relatively short period starting from that low base. Besides, there is still disagreement in academic circles about whether inheritances expand or reduce wealth inequality, for which this study aimed to provide empirical evidence from China. Second, this study explores the role of inheritances in wealth distribution from class mobility and inequality

perspectives. Most empirical studies focused on whether inheritances expand or reduce wealth inequality but ignored the restrictive effects of inheritances on class mobility. This paper starts by analyzing the distribution of inheritances and its influence on wealth accumulation to study the possible influence of inheritances on social mobility. In this way, we analyze the role of inheritances in wealth distribution more comprehensively.

The remainder of the paper is structured as follows. Section 2 presents the hypothesis. Section 3 presents data and methods. Section 4 describes the characteristics of Chinese household inheritances. Section 5 considers the contribution of inheritance to wealth accumulation. Section 6 explores the impact of inheritance on wealth inequality. Section 7 concludes.

2. Hypothesis

One of the most classic accumulation theories of household wealth, the life cycle saving model (Modigliani and Brumberg, 1954), holds that household wealth gradually accumulates with the establishment of the family (marriage) and then, is gradually consumed as the family experiences contraction (when the children leave) and disintegration (the death of a spouse). However, researchers have found that it was difficult to explain the wealth distribution presented by empirical data based on the life cycle accumulation theory alone. This theory can simulate real data better by applying the inheritance mechanism, which establishes the close relationship between inheritances and wealth accumulation (Nardi, 2004). Some empirical studies have found that the proportion of inheritances in total wealth is between 35 percent and 45 percent (Davies and Shorrocks, 2000). Others found that inheritances in some European countries and the United States became increasingly crucial in wealth accumulation after the 1980s (Piketty, 2011; Ohlsson et al., 2020).

In China, there is still no direct empirical study on the role of inheritances in the accumulation of household wealth, but three situations should be considered. First, Chinese household wealth mainly began to accumulate after the reform and opening up in 1978. Moreover, most of the individuals who accumulated this enormous wealth are still alive; therefore, the total amount of inheritances is relatively small. Second, rapid economic growth allows individuals to accumulate a large amount of wealth during their lifetime, effectively reducing the relative share of inheritances in total wealth. Third, Chinese traditional Confucian culture has maintained close functional ties between generations with frequent daily economic exchanges. Therefore, parents often transfer the household wealth to the offspring as gifts during their lifetime, making it challenging to accumulate enormous inheritances. These three situations may limit the role of inheritances in the accumulation of household wealth in China, but it is still believed that inheritances play a role in promoting household wealth accumulation. Also, most previous studies found that wealthy households are more likely to leave large-scale inheritances to their offspring (Wolff and Gittleman, 2014; Elinder et al., 2018). Therefore, the transfer of inheritances may make the offspring of wealthy households wealthier and decrease intergenerational mobility. Based on this background, this study proposes the following hypothesis:

Hypothesis 1   Inheritances can significantly promote the accumulation of household wealth and aggravate class stratification.

The influence of inheritances on wealth inequality has caught great attention from scholars. In terms of the theoretical models, Stiglitz (1969) noted that the concavity of inheritances and the equalization of labor incomes would gradually reduce wealth inequality over time. Bourguignon (1981) extended Stiglitz's model and noted that if the saving function were convex, then wealth inequality would continue over the long-term. Moreover, the wealth transfer behavior model suggested that altruistic motivations would give inheritances an equalizing effect on wealth inequality, while exchange motivation or strategic motivation would have the opposite effect (Tomes, 1981; Davies and Shorrocks, 2000). The conclusions predicted by these models have been verified to varying degrees in empirical studies.

On the whole, most empirical studies showed that inheritances could help reduce wealth inequality, but some found that the effects of inheritances are minimal. There is little evidence showing that inheritances can directly expand wealth inequality. For example, Wolff and his collaborators found that in the United States, the proportion of inheritances received by low-income households in household wealth was higher than that of wealthy households, enabling inheritances to reduce wealth inequality (Wolff, 2002; Wolff and Gittleman, 2014). Karagiannaki (2015, 2017) found that in the past 30 years, the inheritance scale was expanding in Britain, while wealth inequality among households who received inheritances was also expanding, but wealth inequality was decreasing for all households. Moreover, although the inheritance inequality was large, it had a small impact on wealth inequality. Elinder *et al.* (2018) found that inheritances can help reduce wealth inequality and promote intergenerational mobility in Sweden. Although wealthy successors received greater inheritances, the inheritances received by poor successors accounted for a higher proportion of their initial wealth. Moreover, Crawford and Hood (2016) calculated personal pensions as part of household wealth in Britain and found that inheritances and gifts no longer reduced wealth inequality. They also found that pensions occupied a higher share of household wealth at the bottom of British society, thereby reducing the proportion of inheritances in the household wealth of those at the bottom. O'Dwyer (2001) analyzed Australian data and determined that inheritances may significantly impact on the life processes of some individuals but have no significant impact on the wealth distribution of the entire society. Therefore, this study proposed the following hypothesis:

Hypothesis 2   Inheritances can reduce relative wealth inequality but widen the absolute wealth gap.

3. Data and Methods

3.1. *Data*

The data used in this study were drawn from the China Health and Retirement Longitudinal Study (CHARLS) data. CHARLS has collected a high quality

nationally representative sample of Chinese residents ages 45 and older. The pilot survey of CHARLS was conducted in two provinces (Gansu and Zhejiang) in 2008. The baseline national wave of CHARLS was fielded in 2011 and included about 150 counties/districts and 450 villages/resident committees. After that, CHARLS conducted a follow-up survey on the samples every 2 to 3 years, and four follow-up surveys in 2011 (wave 1), 2013 (wave 2), 2015 (wave 3) and 2018 (wave 4) have been completed. This set of surveys contained detailed information on wealth, income, and household member characteristics. In addition, CHARLS also conducted two national special surveys, the "2014 CHARLS Life History Survey" and the "2016 CHARLS Economic History Survey of the Early PRC," which also fully covered the above sample areas. Among them, the 2014 CHARLS Life History Survey provided inheritance information in detail. Moreover, the samples of 2013 CHARLS wave 2 (baseline national wave) and the 2014 CHARLS Life History Survey (national special survey) are the most consistent. Therefore, this study selected the 2013 CHARLS wave 2 and the 2014 CHARLS Life History Survey data. These data represent only a specific population and exclude the representation of the younger population of the country. Thus, the distribution of wealth and inheritance may be inaccurate if directly measured. However, it is feasible to focus on the role of inheritances in the formation of wealth inequality. Moreover, the primary age of inheritance is over 45 years old. Therefore, although this study's results may be insufficient for inferring China's whole situation, they are still representative results for studying the influence of inheritances on wealth distribution in the present study.

It is challenging to collect wealth data in practice, but CHARLS used various methods to ensure the accuracy of wealth data. First, it listed sub-projects under the big project to help respondents recall their estimates. Second, if respondents refused to answer or were not sure about the specific amount of wealth, it gave them a numerical range to choose from. These measures solved the problem of missing values to a certain extent. However, like other sample surveys, CHARLS data did not capture information on extremely wealthy people. Our data's wealthiest households' net wealth is only CNY 14,400,000 (USD 2,380,000), which obviously cannot be compared with the vast wealth owned by individuals in various rich lists in China. We also consider using the rich list data to fit the top wealthy groups, but this type of data lack inheritance and demographic information for relevant analyses in this study. For this issue, we have added further discussion in the last part of the paper.

After data processing and removal of some invalid observations, we obtained a total of 9,213 valid household observations, including 414 households with negative net wealth and 165 households with negative inheritance.[1]

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[1]The questionnaire designer counted the inherited liabilities into inheritances, and we retained the original data. Although, like in most countries in the world, the Law of Succession in China also indicates that inheritance will not have a negative value. However, in daily practice, especially in rural China, the repayment of the parent's debt by the child is common. A typical example is that the parents manage the marriage for their children (especially for the son to prepare the betrothal presents, houses, and vehicles, etc.) and sometimes they will owe huge debts. If the parents have not paid off the debts when they were alive, the children will inherit the debts ethically.

3.2. *Variables*

3.2.1. Measures of Wealth

In existing studies, household wealth is generally measured by the household total net worth, which is obtained by subtracting the total debts from the total assets (Davies and Shorrocks, 2000). Combining the definitions and the information provided by household survey data in our study, the total assets include six items: (1) housing assets; (2) land assets; (3) household equipment, durable consumer goods, and other valuables; (4) household productive fixation assets; (5) financial assets, such as cash, deposits, stocks, and funds; and (6) inter-personal loans. The total debts include four items: (1) house purchases and construction debts; (2) mortgage loans (except for house purchase and construction); (3) personal debts; and (4) credit card debts. Respondents recorded their estimates for the market value of each asset and debt. We use median values to replace some missing values. Land assets were calculated according to the method proposed by McKinley and Griffin (1993), assuming that 25 percent of the gross income of household farming operations was from land with a yield rate of 8 percent, thereby estimating the value of the land.

3.2.2. Measures of Inheritance

The 2014 CHARLS Life History Survey data provided the inheritance information for the primary respondents and their spouses. These data were obtained based on the memories of respondents who recalled the time, amount, form, and source of their past inheritances. Since the information on household wealth was obtained in 2013, the inheritances received by the respondents in 2014 were deleted. The prices of the inheritances were adjusted with the 2013 price as the base period using CPI data. After data processing and the removal of some invalid observations, 9,213 valid household observations were obtained, among which 1,696 households had received inheritances, accounting for 18.41 percent of the sample. Besides, to more accurately examine the time, source, and form of inheritance, the data in Table 2 in Section 4.1 used 20,148 individual observations, 2,091 of which had received inheritances. The rest of the data are based on the households as a unit.

3.2.3. Other Variables

Three categories of control variables in the regression equation were selected based on the previous literature (Meng, 2007; Behrman *et al.*, 2012; Letkiewicz and Fox, 2014; Jin and Xie, 2017). The first of which is per capita income. As the most important way to accumulate household wealth, income includes wage income, transfer income, property income, and business income (Table 1). Due to limited data availability, the income in this study uses the average income of the principal respondents and their spouses. The second is individual and household characteristic variables, including household member size, householder health status, age, communist party members, education level, marital status, and self-employment.

TABLE 1
DATA DESCRIPTION

Variables	Mean	Std.	Obs	Variable Definitions
TNW	230.604	428.266	9,231	Household total net worth (thousand CNY)
NVI	1.447	19.849	9,231	Net value of inheritance (thousand CNY)
PInc	28.885	46.622	9,231	Per capita income of respondents and their spouses (thousand CNY)
HMS	3.398	1.839	9,231	House member size
Hea	2.152	0.731	9,231	Householder self-assessed health status, poor: 1, fair: 2, good: 3, very good: 4
Age	60.636	10.297	9,231	Householder age
CCP	0.167	0.373	9,231	Member of the Communist Party of China, yes: 1, no: 0
Edu	7.847	2.611	9,231	Householder education in years, elementary school and below:6, junior high school: 9, high school: 12, university and above: 16
Mar	0.725	0.432	9,231	Householder marital status, married: 1, others: 0
SeE	0.089	0.285	9,231	Self-employed, yes: 1, no: 0
Reg	2.003	0.825	9,231	East Region: 1, Central Region: 2, West Region: 3
Urban	0.375	0.484	9,231	Urban: 1, rural: 0

Notes: TNW, NVI, and PInc are all processed by adding 1 to the logarithm in the following empirical model.

The third is macro variables, including regional variables and urban or rural variables.[2]

3.3. *Methods*

3.3.1. Methods for the Impact of Inheritance on Wealth Accumulation

The wealth distribution is not a normal distribution. If the net wealth is directly used as the explained variable, it will be easily affected by extreme values, making the regression results unreliable. Research conducted by Carroll *et al.* (2003) showed that the residual distribution obtained by directly estimating the wealth function with unconverted wealth values could not pass the test of normal distribution. The research results of Meng (2007) also showed that the use of net wealth as the explained variable could not have good regression results. Jin and Xie (2017) performed logarithmic transformations on wealth to overcome this issue. However, this method did not support negative wealth. In this study, both

[2]The eastern region includes Shanghai, Beijing, Tianjin, Shandong, Guangdong, Jiangsu, Hebei, Zhejiang, Fujian, and Liaoning; the central region includes Jilin, Anhui, Shanxi, Jiangxi, Henan, Hubei, Hunan, and Heilongjiang provinces and cities; the western region includes Yunnan, Inner Mongolia, Sichuan, Guangxi, Xinjiang, Gansu, Guizhou, Chongqing, Shaanxi, and Qinghai.

TABLE 2
DISTRIBUTION OF TIME, SOURCE, AND FORM OF INHERITANCE

		Freq.	Percent (%)	Total Value (Thousand CNY)	Percent of Value (%)	Mean Value (Thousand CNY)
A. Time of inheritance	2004–2013	380	18.18	13,430.10	34.76	35.32
	1994–2003	422	20.18	4,605.03	11.92	10.89
	1984–1993	624	29.84	15,229.54	39.41	24.35
	1974–1983	430	20.56	4,219.46	10.92	9.79
	1973 and before	235	11.24	1,154.55	2.99	4.90
	Total	2,091	100.00	38,638.62	100.00	8.53
B. Source of inheritance	Parents	1,678	81.30	32,982.91	89.18	19.58
	Parent-in-law	268	12.98	2,732.61	7.39	10.22
	Former spouse	44	2.13	521.53	1.42	11.83
	Children	6	0.29	−127.63	−0.35	−21.27
	Relatives	65	3.15	869.78	2.35	13.37
	Others	3	0.15	3.64	0.01	1.22
	Total	2,064	100.00	36,983.07	100.00	17.88
C. Form of inheritance	Houses	1,423	53.78	—	—	—
	Land	383	14.47	—	—	—
	Financial assets	119	4.50	—	—	—
	Financial debts	492	18.59	—	—	—
	Durable assets	191	7.22	—	—	—
	Others	38	1.44	—	—	—
	Total	2,646	100.00	—	—	—

Notes: (1) The observations used in the above table are individual observations, with a total of 20148, and differ from the household observations used in other parts of the study. (2) The value of inheritance underwent price adjustments based on the previous Consumer Price Index (CPI).

the explained variable (wealth) and the explanatory variable (inheritance) have problems such as negative values and non-normal distribution. To avoid these two problems, this study followed the method used by Carroll *et al.* (2003). First, the wealth and inheritance analyses are performed with an inverse hyperbolic sine transformation:

$$(1) \qquad \sinh^{-1}(\theta, W) = \ln\left(\theta W + \left(\theta^2 W^2 + 1\right)^{1/2}\right)/\theta$$

where W is the total household net wealth, θ and σ are the damping parameters.[3] Using the transformation methods in equations (1) and (2), the influence of extreme values is reduced. At the same time, the constraint that wealth and inheritance can only be positive is eliminated. The transformed wealth is used as the explained variable and the transformed inheritance is used as the explanatory vari-

$$(2) \qquad \sinh^{-1}(\sigma, I) = \ln\left(\sigma I + \left(\sigma^2 I^2 + 1\right)^{1/2}\right)/\theta$$

able. The estimated equation of the wealth function is:

$$(3) \qquad \sinh^{-1}(\theta, W_i) = \alpha_0 + \gamma_1 \sinh^{-1}(\sigma, I_i) + \sum_j \beta_j Contr_i + \varepsilon_i$$

$Contr_i$ is the set of control variables. We performed the logarithmic transformation on the income variable. Meanwhile, for inheritance variables, we also considered the net inheritance (depth of inheritance) and the dummy variable of the inheritance (breadth of inheritance) in the regression estimation. The Subscript i represents the i-th household, and the subscript j represents the j-th proxy variable of the control variables.

Second, to obtain a more robust estimate for the influence of inheritances on wealth accumulation and observe the heterogeneous influence of inheritances on wealth accumulation, we further extended the benchmark model and used the quantile regression:

$$(4) \qquad \sinh^{-1}(\theta, W_{i,q}) = \alpha_0 + \gamma_{1,q} \sinh^{-1}(\sigma, I_{i,q}) + \sum_j \beta_{j,q} Contr_{i,q} + \varepsilon_{i,q}$$

where the explained variable $W_{i,q}$ represents the total net wealth of the household i in the quantile q. We took inverse hyperbolic sine function form of equation (4). The other variables have the same meaning as above. The inference of the quantile regression coefficient $\delta_{1,q}$ depends on the bootstrap method, which can continuously sample the original observations with replacement and then, perform statistical inference on the population. The specific process and a demonstration can be found in Efron (1979), Lamarche (2010).

[3]In this study, σ was 4.5 and θ was 0.00003. σ should be determined first. The selection criterion was to make the inheritance variable conform to the normal distribution as much as possible. After σ was determined, the selection criterion of θ was to make the regression residuals conform to the normal distribution as much as possible. The value of θ in our study was close to the estimated result of Meng (2007).

TABLE 3
DISTRIBUTION OF INHERITANCE BY GROUP

	Percent of Households Receiving Inheritance (%)	Inheriting Households			All Households		
		Mean Value of Inheritance (Thousand CNY)	Value of Inheritance as a Percentage of Net Worth (%)	Obs	Mean Value of Inheritance (Thousand CNY)	Value of Inheritance as a Percentage of Net Worth (%)	Obs
All households	18.41	10.54	4.82	1,696	1.94	0.87	9,213
A. Household registrations							
Rural	19.49	8.35	4.38	1,358	1.63	0.90	6,969
Urban	15.02	19.84	6.05	319	2.98	0.84	2,123
B. Age class							
45–54	20.09	12.41	5.42	593	2.49	0.99	2,952
55–64	20.03	9.74	4.18	660	1.95	0.85	3,295
65–74	16.56	9.73	5.12	334	1.61	0.83	2,017
75 or over	11.48	7.60	4.61	109	0.87	0.48	949
C. Education							
Less than 9 years	17.51	8.98	4.61	906	1.57	0.89	5,175
9 years	21.32	9.89	4.56	518	2.11	0.93	2,430
10–12 years	17.27	14.13	5.30	230	2.44	0.79	1,332
13 years or more	15.22	32.20	6.47	42	4.90	0.73	276
D. Income level (CNY)							
Under 1,000	17.25	8.19	5.36	347	1.41	0.89	2,012
1,001–2,500	18.59	6.59	4.32	357	1.22	0.86	1,920
2,501–5,000	16.57	11.51	7.64	166	1.91	1.32	1,002
5,001–10,000	21.15	8.87	4.66	151	1.88	1.12	714
10,001–25,000	19.48	12.52	5.02	293	2.44	1.04	1,504
25,001–50,000	19.39	12.80	5.01	261	2.58	0.81	1,346
50,001 or over	16.92	19.95	3.45	121	3.38	0.55	715
E. Wealth level (CNY)							
Under 25,000	17.59	7.41	−60.76	307	1.30	−13.87	1,745

(Continues)

TABLE 3 (CONTINUED)

	Inheriting Households				All Households		
	Percent of Households Receiving Inheritance (%)	Mean Value of Inheritance (Thousand CNY)	Value of Inheritance as a Percentage of Net Worth (%)	Obs	Mean Value of Inheritance (Thousand CNY)	Value of Inheritance as a Percentage of Net Worth (%)	Obs
25,001–50,000	16.06	6.45	17.64	160	1.04	2.84	996
50,001–100,000	19.64	10.58	14.71	259	2.08	2.86	1,319
100,001–250,000	19.39	9.20	5.60	501	1.78	1.08	2,584
250,001–500,000	19.13	11.04	3.09	299	2.11	0.60	1,563
500,001 or over	16.90	23.01	2.43	170	3.89	0.40	1,006

Notes: The value of inheritance has undergone price adjustments based on the previous CPI.

Methods for the Impact of Inheritance on Wealth Inequality

To study the impact of inheritance on wealth inequality, the inequality index of household wealth excluding inheritances and including inheritances can be estimated for comparison. If the former is smaller than the latter, then inheritances will expand wealth inequality, and vice versa. The data used in this study featured household wealth, including inheritances. To obtain the household wealth excluding inheritances, it is necessary to perform simulations that depend on establishing a model that can fully describe the main characteristics of actual observed savings and wealth behaviors. This type of model generally needs to consider the extent to which inheritances become household wealth as savings, which we call the inheritance saving function $S(y)$. For $S(y)$, it is essential to consider the class differences: The poor class may be more likely to consume inheritances, while the wealthy class may be more likely to save inheritances. In addition, the saving behaviors of the provider or the recipient of inheritances also change when inheritances are expected.

Based on the above considerations, this study applied the analytical strategies of Wolff and Gittleman (2014) and Elinder *et al.* (2018). In the first step, the hypothesized saving behaviors are not affected by inheritances. Inheritance successors save all their inheritances as part of their household wealth, $S(y) = IW$, where IW indicates the inheritances received by the successors. In the second step, the hypothesis of the first step is relaxed. The assumed inheritance successors respond to the inheritances by saving only parts of the inheritances at a fixed saving rate as, $S(y) = \gamma*IW$, where γ is the fixed saving rate. In the third step, the constraints are further relaxed. The assumed saving rate changes with the level of household wealth. Two saving functions are set here: One is a linear function, $S(y) = c*NW*IW$, where the saving rate increases linearly with an increase in wealth. The other is a hyperbolic function, $S(y) = 1-1/(NW/50,000)^{\alpha}*IW$, where the saving rate increases with an increasing wealth level, but the growth rate shows a downward trend. Here, NW indicates the current household net worth, and both c and α are constants.

Besides, this study uses the factor decomposition method for the inequality level to decompose the Gini coefficient of household net worth. The basic idea of this method is to decompose the inequality of a particular total amount Y compared to the sub-elements Y_i that constitute the total amount (Shorrocks, 1982). The application here is to study the influence of household net worth with both excluding and including inheritances on the distribution of household net worth. The specific calculation process uses the Distributive Analysis Stata Package (DASP) compatible with the Stata software.

4. DESCRIPTIVE STATISTICAL ANALYSIS OF INHERITANCE

4.1. *Time, Source, and Form of Inheritance*

Table 2 shows the distribution of the time, source, and form of the respondents' inheritances. From the perspective of inheritance time, the frequency of inheritances at each stage was basically the same at about 20 percent. The

frequency of inheritances from 1984 to 1993 was higher—up to 30 percent. Generally speaking, the earlier the inheritances are received, the lower their value. For example, the value of each inheritance received from 2004 to 2013 was about CNY 35,300 (approximately USD 5,800),[4] while the value of each inheritance received in the 1980s and before was less than CNY 10,000 (approximately USD 1,650).

From the perspective of inheritance sources, parents provide most inheritances. The frequency and value of parental inheritances were much higher than those of inheritances from other household members. In total, 81.3 percent of all inheritances were provided by parents, which accounted for 89.2 percent of the total scale. Second, parents-in-law were also important providers of inheritances, accounting for about 13.0 percent. The inheritances left to parents by their offspring who died young were often debts (negative inheritances).

The forms of inheritance are multifaceted, and there is no specific value for each type. Nevertheless, real estate was the most critical form of inheritance in our data, accounting for 53.8 percent of the total inheritances. According to the vital position of real estate in household wealth, it can be inferred that real estate is also the most valuable part of inheritances. Inheritances in the form of debts accounted for 18.6 percent. The land was also an important form of inheritance, accounting for 14.5 percent. The proportion of inheritances in the form of financial assets was relatively low, only accounting for 4.5 percent.

4.2. *Group Structure of Inheritance*

Table 3 shows the distribution of the inheritance group structure. Generally, 18.4 percent of households received inheritances, which is lower than the United States (21 percent), the United Kingdom (27 percent), and Sweden (34 percent) (Klevmarken, 2004; Wolff and Gittleman, 2014; Karagiannaki, 2017). However, United States and Sweden data included gifts; therefore, there was no substantial gap in the proportion of households receiving inheritances among China and the European countries and the United States. Among each household that had received an inheritance, the average inherited value was about CNY 10,500 (approximately USD 1,700), only accounting for 4.8 percent of the household's net wealth. For all households, the value of inheritances only accounted for 0.87 percent of the household's net worth, which is much lower than the 20 percent–30 percent in developed countries (Wolff and Gittleman, 2014). There may be three reasons for this result. First, the accumulation of household wealth in China mainly occurred in the past 20 years. Only the current middle-aged and the younger of the elderly have accumulated a large amount of wealth through market economy reform and housing reform (Jin and Xie, 2017). The elderly who died did not accumulate much wealth; therefore, the remaining inheritances were also very limited. Second, a large amount of wealth in Chinese households is transferred to the offspring in the form of marriage expenses (e.g., betrothal presents, houses, and vehicles) and gifts during their lifetime, leaving little for the inheritances. Third, the economic growth and sharp increase in housing prices in recent years have allowed many households

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[3]Using the exchange rate as of December 31, 2013: 6.05 CNY/USD.

TABLE 4
THE BREADTH AND DEPTH OF INHERITANCE AND WEALTH ACCUMULATION

Dependent Variable: sinh⁻¹ (Household Total Net Wealth)	OLS			Quantile Regressions		
	M1	M2	M3	Q (0.25)	Q (0.50)	Q (0.75)
Breadth of inheritance	—	2,316*	—	—	—	—
		(1,338)				
$sinh^{-1}$ (Depth of inheritance)	1,171**	—	2,273***	882	1,196**	1,229**
	(534)		(856)	(818)	(597)	(530)
Ln (PInc)	2,660***	2,668***	3,324***	3,191***	3,564***	2,422***
	(212)	(212)	(536)	(259)	(238)	(242)
HMS	3,727***	3,733***	3,503***	4,569***	4,401***	3,548***
	(244)	(244)	(566)	(232)	(246)	(2,966)
Hea	5,510***	5,500***	6,343***	5,806***	6,069***	4,665***
	(612)	(612)	(1,659)	(906)	(468)	(588)
Age	−202***	−117**	309**	−172***	−256***	−195***
	(56)	(46)	(122)	(66)	(52)	(57)
CCP	4,431***	4,419***	2,924	4,846***	5,852***	6,275 ***
	(1,225)	(1,226)	(3,102)	(932)	(1,229)	(1,201)
Edu	4,705***	4,724***	1,470	6,270***	6,214***	4,954***
	(615)	(614)	(1,488)	(990)	(751)	(548)
Mar	3,547	−9	−114	−153	345	392
	(273)	(273)	(738)	(248)	(393)	(300)
SeE	6,031***	6,027***	10,941***	6,920**	7,324***	7,785***
	(1,795)	(1,795)	(3,774)	(2,728)	(1,176)	(1,346)
Reg (ref. East) Central	−10,643***	−10,726***	−6,621**	−8,943***	−10,588***	−9,382***
	(1,042)	(1,044)	(2,643)	(970)	(1,230)	(1,071)
West	−11,117***	−11,103***	−13,308***	−11,298***	−10,252***	−9,501***
	(1,043)	(1,044)	(2,369)	(1,254)	(975)	(1,039)
Urban	14,698***	14,689***	12,142***	14,233***	18,539***	16,385***
	(929)	(931)	(2,374)	(1,552)	(1,249)	(1,034)
Constant	9,585**	9,760**	−2,680	−15,976**	7,996**	47,448***
	(4,117)	(4,127)	(10,326)	(6,471)	(3,630)	(4,835)
Obs.	9,213	9,213	1,696	9,213	9,213	9,213
R^2	0.157	0.156	0.146	0.111	0.130	0.112

Notes: (1) Robust standard errors are given in parentheses. *, **, and *** denote 10%, 5%, and 1% significance levels, respectively. (2) Model 3 only includes 1,696 inheriting households.

to accumulate enormous wealth through market interactions, thereby reducing the proportion of inheritances.

There are differences in the proportions of inheritances, the average value of inheritances, and the proportion of inheritances in household net worth among the interviewed households with different household registrations, ages, education levels, household incomes, and household wealth levels. From the perspective of urban and rural household registrations, rural households (19.5 percent) had a higher proportion of inheritances than urban households (15.0 percent). However, the average value of inheritances and the proportion of inheritances in household net worth received by rural households were lower than those of urban households. From the perspective of age groups, the proportion and scale of inheritances gradually decreased with an increase in age. This reflects the combined effect of the cohort effect and the life-cycle effect. However, the cohort effect (in the era of China's market economy development, the older the parents are, the lower the proportion and the smaller the scale of the inheritances left) was significantly greater than the life-cycle effect (older parents may be more likely to leave inheritances due to the risk of death). At the same time, the percentage of inheritances in household net worth for all households also decreased with age.

The education level, household income, and household wealth level are often used to measure a household's socioeconomic level. There is a significant positive correlation among these three, which we also observed in the group structure mentioned above. Specifically, the higher the household's socioeconomic status (education, income, and wealth), the higher the average value of the inheritances received by the household, and the smaller the percentage of inheritances as part of the household's net worth. On the one hand, wealthy households received inheritances on a larger scale, which widened the absolute wealth gap among households; on the other hand, inheritances were more important to households with lower socioeconomic statuses (where inheritances comprised a higher proportion of household wealth). From this perspective, inheritances are likely to help reduce the inequality of household wealth. This result is consistent with Hypothesis 2. The relevant content is further studied in the following sections.

5. The Impact of Inheritance on Wealth Accumulation

This section describes the OLS regression results for testing the influence of inheritances on household wealth accumulation. Table 4 shows the estimated results, where M1 model controls the individual and household characteristics such as per capita income, education level, household size, and macroscopic variables such as region, and urban and rural areas. It was found that the inheritance depth still positively affects the accumulation of household wealth significantly. The more inheritances the household received, the greater the accumulated household wealth. Moreover, the previous section found that the higher the socioeconomic status of the household (i.e., the higher the education level, income, and wealth), the higher the average value of that household's inheritances. This indicates that wealthy households benefit from the positive effects of the inheritance scale. The positive effect of inheritances on household wealth accumulation would

help the rich stay rich while the poor become poorer. In other words, inheritances intensify class stratification and reduce social mobility, which verifies Hypothesis 1. The model M2 analyzed the influence of inheritances on the accumulation of household wealth from the perspective of inheritance breadth—that is, whether the household received inheritances. We found that, compared with households that did not receive inheritances, the wealth level of households that received inheritances was higher. The M3 model only estimated the effects on the households receiving inheritances. The results show that inheritances can enhance the accumulation of household wealth. This model's regression coefficient (2,273) was significantly larger than the one estimated for all household observations (1,171). Since the inheritance depth provides more information about inheritances than the inheritance breadth, the regression models in the following sections all use the inheritance depth as the core explanatory variable.

Households with different wealth levels may have different reactions after obtaining inheritances. For example, Engel's Law states that the lower class may be more likely to consume inheritances, while the wealthy class may be more likely to save inheritances. Therefore, the influence of inheritances on the household wealth levels of different wealth classes may be heterogeneous. At the same time, compared with OLS regression, quantile regression is less susceptible to extreme values and can provide more robust estimated results. The fifth, sixth, and seventh columns of Table 4, respectively, show the estimated regression results of the explained variables for the 25th (low wealth group), 50th (medium wealth group), and 75th (high wealth group) quantiles. The results show that inheritances had a significant positive effect on the household wealth level of the medium wealth group and the high wealth group, but their influence on the household wealth level of the low wealth group is insignificance. The coefficients' size shows that inheritances had the most significant influence on the accumulation of household wealth in the high wealth group, followed by households in the medium wealth group. The influence on the low wealth group is the smallest. To a certain extent, the differences in the regression coefficients of different wealth groups reflect the influence of inheritances on household wealth inequality. The influence of inheritances on wealth inequality is further discussed in the next section.

In terms of control variables, higher per capita income was associated with higher total household wealth, which is consistent with the results of most studies (Li *et al.*, 2016; Jin and Xie, 2017). Second, respondents' characteristics and household characteristics had significant influences on the total household wealth, which is consistent with the theoretical expectations. The larger the household size was, the greater the total household wealth, which may be related to the size effect of household members. Moreover, the better the respondents' health self-assessment was, the greater the total household wealth. This may be because healthy people have higher incomes and lower medical expenses; therefore, they can accumulate more wealth. Furthermore, the higher the average age was, the lower the household wealth level. This is different from the "Inverted U-shaped" relationship between age and wealth level predicted by the life-cycle theory, where the peak occurs near the retirement age. This may have resulted from two factors. First, the retirement age stipulated by Chinese law is 60 years old for males, 55 years old for female officials, and 50 years old for female workers. Males engaged in certain high-risk jobs

TABLE 5

THE EFFECTS OF ELIMINATING INHERITANCE ON THE SIZE DISTRIBUTION OF WEALTH (INHERITANCE SAVING FUNCTION UNDER COMPLETE SAVING CONDITIONS)

	The Distribution of Wealth by Quintile (%)					100*Gini	Percentage Reduction in Net Worth (%)
	Bottom	Second	Third	Fourth	Top		
NW	−0.67	4.62	11.08	21.52	63.45	63.44	—
NIW	−0.79	4.52	11.00	21.55	63.71	63.94	0.88

Notes: NIW = NW- IW, where NW = Net wealth, NIW = Non-inherited wealth, and IW = Inherited wealth.

such as working at heights and high temperatures should retire at 55 years old, and females should retire at 45 years old. Moreover, early retirement in the Chinese labor market is relatively common; therefore, the actual retirement age of Chinese residents is relatively low. Second, the initial survey age of the CHARLS data we used was 45 years old for the head of the household or his/her spouse.[5] Compared to non-party member households, the household wealth level of party members was higher (Meng, 2007). The higher the education level was, the higher the wealth level. The household wealth level of married individuals was higher than that of unmarried ones, reflecting the advantages of "economies of scale," such as double wages (Vespa and Painter, 2011). The household wealth level of self-employed individuals was higher than that of non-self-employed households. Third, regional, urban or rural macroscopic variables also significantly affected the total household wealth, which is consistent with intuition. The household wealth level in the East was higher than that in the Central and West, and the household wealth level in urban areas was higher than that in rural areas.

6. THE IMPACT OF INHERITANCE ON WEALTH INEQUALITY

6.1. *Inheritance Saving Function under Complete Saving Conditions*

First, we assume that the heir will save all the inheritances. The household net worth excluding inheritances can be determined by subtracting the received inheritances from the current household net worth:

$$(5) \qquad NIW = NW - IW$$

where *NIW* indicates the household net worth excluding inheritances, *NW* indicates the current household net worth, and *IW* indicates the inheritances received by the inheritance successors. To compare the influence of inheritances on wealth inequality, the distribution of *NW* and *NIW* was compared (Columns 2–6 in Table 5). All households were divided into five groups based on the level of their household net worth. The top households possess the greatest share of wealth. For example, in the fifth group (the top 20 percent) of households possessed 63.45 percent of

[4]We also added the age squared value when constructing the model. However, the information criterion test found that the model was better after the squared age was removed. Therefore, we judged that the peak value of net wealth was 45 years old or below, which was consistent with the results of Li *et al.* (2016) and Wei and Zhong (2017). Their results were 46.6 years old and 32–35 years old.
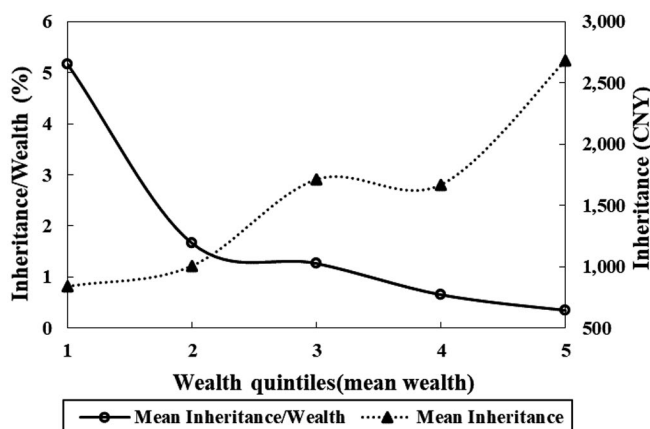
Figure 2. Absolute and Relative Sizes of Inheritance by Wealth Quintiles

all wealth, while the bottom 20 percent had debts accounting for −0.67 percent. When all inheritances were deducted, the distribution of household net worth changed. The primary manifestation of this change was that the wealth owned by the bottom households (Groups 1, 2, and 3) decreased to varying degrees, while the wealth of the top households (Groups 4 and 5) increased to varying degrees. This indicates that after inheritances were deducted from household wealth, the property shares of poor households compared to wealthy households decreased. In other words, the acquisition of inheritance increases the wealth share of poor households in terms of their total wealth. From this perspective, inheritances help to reduce wealth inequality.

The Gini coefficient of the household net worth excluding inheritances was 0.639 (Column 7 of Table 5). After inheritances were included, the Gini coefficient decreased to 0.634. From the perspective of the Gini coefficient, inheritances also help to reduce wealth inequality. The previous descriptive statistical analysis of inheritances showed that although wealthy households obtain greater inheritances than poor households, the proportion of inheritances in terms of household net worth was higher than that of wealthy households. It indicates that a small gift to the poor is more valuable and meaningful than a big gift to the rich.

From the perspective of contributions, the household net worth excluding inheritances provided the vast majority of contributions, accounting for 99.22 percent, while the inheritances had only a small influence on the inequality in household net worth, with a contribution of 0.88 percent. Karagiannaki (2017) analyzed the UK data and found that inheritances contributed about 5.4 percent to wealth inequality (they used the coefficient of variation instead of the Gini coefficient), which is higher than our findings. However, since China's future inheritance scale will increase rapidly as many individuals who accumulated large amounts of wealth enter old age, the contribution of inheritances to household wealth inequality will inevitably increase and approach that in some European countries and the United States.

6.2. *How Can the Equalizing Effect be Explained?*

The inequality decreases in household wealth caused by inheritances can be explained by the fact that the proportion of the value of the inheritance received by poor households in the household net worth was higher than that of wealthy households. Figure 2 shows how the inheritance scale changes with the level of household wealth. First, for the absolute amount of inheritances (right axis), wealthy households inherit larger inheritances. For example, the average value of inheritances received by 20 percent of households with the lowest net wealth is only CNY 840 (approximately USD 140), while the average inheritances received by households with the highest quintile of net wealth is CNY 2,680 (approximately USD 440). There is a positive correlation between the absolute scale of inheritance and household wealth, indicating that inheritances widen the absolute gap in household wealth. Conversely, when looking at the relative importance of inheritances, dividing inheritances by the household net worth, the result is the opposite (left axis). The bottom 20 percent of net wealth households received inheritances accounting for 5.2 percent of their wealth, while the top 20 percent of net wealth households received inheritances accounting for only 0.35 percent of their wealth. The inheritances received by poor households are more important than their wealth, which can explain why inheritances reduce household wealth inequality.

The following mechanisms may explain why poor households can obtain a relatively higher proportion of inheritances. First, it comes from the altruistic motivation of the inheritance donor. Our descriptive analysis found that 81.3 percent of inheritances are from parents; the second most important source is parents-in-law, accounting for 13.0 percent. The sum of these two is more than 94 percent, constituting the vast majority of inheritance sources. Most studies found that there are many altruistic behaviors in the daily interactions between parents and their offspring. Parents obtain utility not only from consumption but also from the increasing welfare of their offspring. For wealth transfer or inheritance gifts, on the one hand, parents transfer different amounts of wealth based on the different endowments and conditions of their offspring. Parents may be more likely to transfer greater wealth to offspring in a poor situation. From this perspective, parents would transfer between generations (including gifts) to equalize or reduce wealth inequality among their offspring. On the other hand, parents also consider the wealth status of their offspring compared to society as a whole. Poor parents may have a high saving rate, even higher than wealthy parents,[6] and transfer those savings to their offspring, thereby more greatly reducing the wealth inequality of their offspring compared to a wealthy household. Comprehensively speaking, if parents uphold altruistic motivations in their inheritance gifts, poor offspring may be more

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[5]In developed countries, the saving rate of the rich is higher than that of the poor, which is supported by most theoretical and empirical studies (Dynan *et al.*, 2004), but this phenomenon has a certain specificity in China. Research showed that in China, the saving rate of the poor was high, which might even be higher than that of the rich. For example, Jin *et al.* (2011) used household survey data to find that the saving rate of the poor in China who pursue higher social status is higher than that of the rich. This is the direct evidence of our opinion. Wei and Zhang (2011) believed that fierce competition in the marriage market caused by the gender imbalance in China was an important reason for the increasing saving rate. The poor would face greater competitions in the marriage market, which might be the indirect evidence proving that the saving rate of the poor was equal to or even higher than that of the rich.

TABLE 6

THE EFFECTS OF ELIMINATING INHERITANCE ON THE SIZE DISTRIBUTION OF WEALTH (INHERITANCE SAVING FUNCTION UNDER FIXED SAVING RATE CONDITIONS)

	The Distribution of Wealth by Quintile (%)					100*Gini	Percentage Reduction in Net Worth (%)
	Bottom	Second	Third	Fourth	Top		
NW	-0.67	4.62	11.08	21.52	63.45	63.44	—
NIW							
$\gamma = 0.25$	-0.70	4.59	11.06	21.53	63.52	63.55	0.21
$\gamma = 0.50$	-0.73	4.57	11.04	21.54	63.58	63.67	0.41
$\gamma = 0.75$	-0.76	4.54	11.03	21.54	63.65	63.80	0.60
$\gamma = 1.00$	-0.79	4.52	11.01	21.55	63.71	63.94	0.78

Notes: (1) NIW = NW- IW, where NW = Net wealth, NIW = Non-inherited wealth, and IW = Inherited wealth. (2) NIW = NW- γ*IW, where γ = dW/dI = change in net worth per CNY of inheritance.

likely to receive a relatively high proportion of inheritance. Many studies found that altruistic motivation is significant in intergenerational transfer behaviors (Attias *et al*., 2005; Cai *et al*., 2006), which provides indirect evidence for this study's mechanism.

Second, if the wealthy class has more offspring, their wealth becomes divided, thereby decreasing the inheritance received by each offspring. This mechanism has been mentioned in many inheritance behavior models (Stiglitz, 1969). However, we used CHARLS data and found no evidence to support this mechanism. We found that wealthy households did not raise more offspring than less wealthy households. Moreover, China's household planning policy is more strictly enforced in wealthy areas and urban areas. Therefore, the theoretical mechanism of inheritances dispersion due to the wealthy class having more offspring is not convincing in China.

Third, during their lifetime, wealthy parents transfer a large amount of wealth to their offspring. The remaining inheritance scale is, therefore, relatively reduced, allowing inheritances to reduce household wealth inequality. Intergenerational wealth transfer generally includes both inheritances and gifts. Intergenerational gifts are widespread in China, such as the wealth transfer of parents to assist their offspring with purchasing houses and the enormous expenditures of wedding supplies and betrothal gifts when the offspring marry. Wealthy parents are more likely to provide their children with larger-scale economic support so that wealthy parents transfer large amounts of wealth to their children during their lifetime, reducing their future inheritance size. This is a plausible explanation mechanism for China, which cannot be empirically analyzed in this study due to data limitations. Future studies should provide empirical evidence for this outcome.

6.3. *Inheritance Saving Function under Fixed Saving Rate Conditions*

In the previous sections, we assume that inheritance successors save all their received inheritances. However, households tend to make adjustments in their saving behaviors when they receive or expect to receive inheritances. Thus, we set parameter γ to indicate households' proportion that convert every CNY of inheritances into savings. In this case, the mathematical expression of household net worth excluding inheritances is:

$$(6) \qquad\qquad NIW = NW - \gamma * IW$$

where the fixed saving rate γ is set to 0.25, 0.50, 0.75, and 1.00 (based on Wolff and Gittleman, 2014). The relevant estimated results are shown in Table 6. When γ increased from 0.25 to 1.00, the Gini coefficient increased from 0.636 to 0.639. These values were all smaller than the Gini coefficient (0.634) of the household net worth including inheritances. It can be seen that after inheritances are removed, the household wealth become more unequal. In other words, inheritances can reduce wealth inequality. The estimated results of the household net worth share of the quinque-group also support this conclusion. With an increase of γ, the wealth of the top households (Groups 4 and 5) increased to varying degrees, but they were all greater than the corresponding share distribution of the household net worth including inheritances. The wealth owned by the bottom households (Groups 1, 2, and 3) decreased to varying degrees, but it was always smaller than

TABLE 7

THE EFFECTS OF ELIMINATING INHERITANCE ON THE SIZE DISTRIBUTION OF WEALTH (INHERITANCE SAVING FUNCTION UNDER VARIABLE SAVING RATE CONDITIONS)

	The Distribution of Wealth by Quintile (%)					100*Gini	Percentage Reduction in Net Worth (%)
	Bottom	Second	Third	Fourth	Top		
NW	−0.67	4.62	11.08	21.52	63.45	63.44	—
NIW: I Linear function[a]							
b = 250,000; c = 0.0000040	−0.68	4.61	11.06	21.50	63.51	63.54	0.76
b = 500,000; c = 0.0000020	−0.68	4.62	11.08	21.53	63.44	63.46	0.53
b = 750,000; c = 0.0000013	−0.68	4.62	11.09	21.54	63.43	63.44	0.42
b = 1,000,000;	−0.68	4.62	11.09	21.54	63.43	63.44	0.35
c = 0.0000010							
II Hyperbolic function[b]							
α = 1.0	−0.68	4.62	11.04	21.51	63.51	63.53	0.61
α = 0.75	−0.68	4.62	11.05	21.51	63.49	63.50	0.56
α = 0.50	−0.68	4.62	11.06	21.52	63.48	63.48	0.46
α = 0.25	−0.67	4.62	11.07	21.52	63.46	63.45	0.29

Notes: (1) $NIW = NW - IW$, where NW = Net wealth, IW = Non-inherited wealth, and IW = Inherited wealth. (2)[a] The results show the distribution of NIW, where $NIW = NW - SAVING*IW$ and $SAVING = c*NW$, $NW <= b$. (3)[b] The results show the distribution of NIW, where $NIW = NW - SAVING*IW$ and $SAVING = 1 - 1/(NW/50000)^{\alpha}$, if $NW > 50000$; $SAVING = 0$ if $NW <= 50000$.

the corresponding share distribution of the household net worth including inheritances. Compared with the Gini coefficient (0.639) of household wealth excluding inheritances under the complete saving conditions (which was greater than the estimated Gini coefficient of household wealth excluding inheritances under all fixed saving rate conditions), it can be determined that when heirs adjust their behaviors and consume or save portions of the inheritances they receive, the role of inheritances in reducing the inequality of household wealth is weakened. From the perspective of contributions, the contribution of inheritances remains small, ranging from 0.21 percent to 0.88 percent.

6.4. *Inheritance Saving Function under Variable Saving Rate Conditions*

Studies on saving behaviors showed that the saving rate was positively correlated with income and wealth (Dynan *et al.*, 2004). Therefore, we assume that wealthy households will use more of their inheritances for savings and study the influence of inheritances on wealth inequality in this case. There are two different hypotheses for setting the savings function. The saving rates under the two hypotheses increase with an increase in household wealth. However, the growth rate under the first hypothesis increases linearly, while the growth rate under the second hypothesis decreases slowly. The mathematical expression of the first hypothesis is as follows:

$$NIW = NW - SAVING * IW$$
$$SAVING = c * NW, \ NW >= 0, NW <= b$$
(7)
$$SAVING = 0, \ NW < 0$$
$$SAVING = 1, \ NW > b.$$

where *SAVING* indicates the variable saving rate of inheritances. The saving rate will increase with an increase in household net worth, but there is an upper bound *b*. When the household wealth exceed the upper bound *b*, the saving rate of inheritances is 1. The saving rate of inheritances is 0 when the household net worth is negative. We selected four different upper wealth bounds *b*: CNY 250,000, CNY 500,000, CNY 750,000, and CNY 1,000,000. The value of slope c is the reciprocal of the corresponding upper bound b, namely, c = 1/b (Wolff and Gittleman, 2014).

The estimated results showed that, for any value of *c*, the Gini function of the household net worth excluding inheritances was greater than the Gini coefficient of the household net worth including inheritances, indicating that inheritances under this hypothetical condition can narrow the wealth gap (Table 7). From the perspective of the household net worth share of the quinque-group, the acquisition of inheritances increased the wealth share of the middle class and reduced the wealth share of the top class.

The mathematical expression of the second hypothesis is as follows:

$$NIW = NW - SAVING * IW$$
(8)
$$SAVING = 1 - 1 / (NW / 50\,000)^\alpha, \ NW > 50\,000$$
$$SAVING = 0, \ NW <= 50\,000.$$

The economic significance of the above saving function *SAVING* is that with an increase in household wealth, the saving rate will gradually increase, while the growth rate will gradually decrease. In other words, the saving function here is concave. Here, parameter α is set to 1.0, 0.75, 0.50, and 0.25. The larger the value of α is, the faster the saving rate increases (Wolff and Gittleman, 2014).

The estimated results showed that for any value of c, the Gini function of the household net worth excluding inheritances was greater than the Gini coefficient of the household net worth including inheritances, indicating that inheritances under this hypothetical condition can reduce wealth inequality (Table 7). In terms of the household net worth share of the quinque-group, the acquisition of inheritances increased the wealth share of the middle class and reduced the upper class's wealth share. This is not entirely equivalent to the changes in wealth distribution under the full savings conditions and the fixed saving rate discussed in previous sections. Compared to the complete saving conditions, inheritances under variable saving rate conditions could also reduce household wealth inequality, but this effect showed a weakening trend. Whether the saving function is linear or nonlinear, the Gini coefficient of household wealth excluding inheritances (Table 7) was less than 0.639 under complete saving conditions (Table 5). This is mainly because relatively poor households may be more likely to consume inheritances directly instead of investing them; therefore, the inheritances received by poor households become relatively further reduced. In addition, from the perspective of contributions, the effect of inheritances on reducing wealth inequality at a variable saving rate remained between 0.29 percent~0.66 percent.

7. Conclusions

This study used the 2013 CHARLS wave 2 and the 2014 CHARLS Life History Survey data to analyze the characteristics of Chinese household inheritances, and the overall impact of inheritances on wealth accumulation and inequality. From our analysis results, the following conclusions were obtained.

First, the proportion of households receiving inheritances in China is slightly lower than that of some European countries and the United States. The inheritance scale, especially the proportion of inheritances in terms of household net worth, is much lower than that of some European countries and the United States. This is not only because the large wealth transfers between generations in China are mostly marriage expenditures and gifts during the parents' lifetimes but are also related to the fact that individuals who accumulated enormous wealth from the market economy reform when they were still alive. However, as these individuals who accumulated large amounts of wealth gradually enter old age, the inheritance scale is likely to expand rapidly. Besides, 80 percent of inheritances come from parents, with real estate being the most common form.

Second, the regression results show that inheritances can significantly promote the accumulation of household wealth. Wealthy households have a higher probability of receiving a larger inheritance. In this way, inheritances can aggravate class stratification and reduce social mobility. This result was proven to be robust through quantile regression.

Third, from the Gini coefficient and wealth share grouping perspective, inheritance reduced relative wealth inequality; but from the perspective of the wealth scale, inheritance widened the absolute wealth gap. The duality of this effect is that although wealthy households will receive inheritances on a larger scale, inheritances are more critical to poor households because the value of the inheritances received by poor households accounts for a higher proportion of the household net worth than that of wealthy households. This is a question of absolute wealth inequality and relative wealth inequality. Kolm (1976a, 1976b) reminds us that different inequality measures would have completely different, or even opposite results. Here is a clear example. However, from the perspective of relative inequality, we should still emphasize that despite its small size, inheritance still had economic significance for the poor households. There are two possible mechanisms behind this phenomenon: (1) the altruistic motivation of the inheritance donor. As the prominent donors of inheritances, parents will balance the wealth differences between their offspring and their social wealth status. (2) The phenomenon where wealthy Chinese parents directly transfer vast amounts of wealth to their offspring during their lifetimes decreases the share of inheritances for their offspring. Also, since the successors have different saving methods for their inheritances, the role of inheritances in reducing wealth inequality is weakened.

It should be noted that household survey data has always had the problem of insufficient representativeness of the wealth distribution's upper tail. Studies have shown that inheritance has a disequalizing effect only for the top 20 percent of the distribution (Blinder, 1973; Davies, 1982). Therefore, it is necessary to discuss further China's top rich people's inheritance and its influence on household wealth distribution. Since the Chinese people's wealth began to accumulate mainly after the reform and opening up in 1978, the parents of rich Chinese people had no chance to leave them with massive inheritances. Therefore, most of the rich offspring are self-made. For example, the "Billionaires Insight 2020" released by United Bank of Switzerland (UBS) and PricewaterhouseCoopers (PwC) showed that 98 percent of China's billionaires were self-made, while self-made billionaires in Europe, the Middle East, and Africa accounted for 60 percent, and self-made billionaires in the United States accounted for 72 percent. The "Very High Net Worth Handbook 2020" published by Wealth-X, a private wealth consulting agency, showed that 85 percent of the very-high-net-worth individuals (VHNW) created wealth through their own efforts, while 96 percent of the Chinese very-high-net-worth individuals (VHNW) were self-made. After analyzing the top 100 richest people on the Hurun China Rich List in 2020, we found that only two of them inherited their family businesses, and that 98 percent of them were self-made.[7] The phenomenon that most Chinese rich people were self-made would reinforce the conclusion of this study that inheritance has not boosted relative wealth inequality in China. We believe that the proportion of China's self-made rich people being much higher than the world average is caused by special historical reasons, which are temporary. Likely, that the share of inheritances in the wealth of the very wealthy will rise in the future as today's ultra-rich begin to die. Therefore,

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[6]The two rich people were Yang Huiyan, ranking 6th, and Yan Hao, ranking 18th. They took over the family business from their fathers Yang Guoqiang and Yan Jiehe, respectively.

we should pay special attention to how China's current rich people will dispose of their vast wealth in the future, which will have an important impact on China's future wealth inequality.

Moreover, the impact of inheritance, (I), on wealth inequality cannot fully explain the influence of inheritances on economic inequality.[8] To assess the latter one may consider the distribution of lifetime income, (L), which is the sum of life-time labor earnings, government transfer payments, and gifts and inheritances. Current net worth, (W), is a small fraction of L for most low-income people, but it is a large fraction of L for many high-income or rich people. Therefore, it is easy for I/W to be larger for low-income people at the same time that I/L is larger for high-income or rich people. We thus need to understand that something that equalizes W may well disequalize L. The research conducted by Davies (1982) showed a similar opinion. Elinder *et al*. (2018) also made useful comments on this issue at the end of their paper.

Fourth, the contribution of inheritances in wealth inequality formation in China is about 1 percent, which is lower than the 5.4 percent value in some European countries, such as the United Kingdom (Karagiannaki, 2017). However, the rapid growth of the inheritance scale in China is expected in the future. The contribution of inheritances to wealth inequality will gradually increase and approach some European countries and the United States. Also, unlike some European countries and the United States, China's one-child policy has effectively reduced the birth rate and yielded a large number of single-child families. Thus, the inheritances that could have been divided equally among siblings or used to compensate the disadvantaged now become the exclusive wealth of only one child, which may concentrate inheritances in the future.[9] At the same time, the slowdown in economic growth in recent years has made it more difficult for ordinary people to accumulate wealth through work, which may further increase the proportion of inheritances in total wealth. The combined effects of these factors are likely to worsen the impact of inheritance on wealth inequality. Therefore, it is essential to consider the distribution and changing trend of inheritances as soon as possible to provide empirical evidence for inheritance taxes, gift taxes, and other related redistribution policies that may be formulated in the future.

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[7]The expansion of this paragraph is entirely derived from the comments of an anonymous Referee. We think this is very constructive, and we are very grateful.
[8]The intergenerational transfer model showed that the number of children was related to the degree of wealth inequality. The fewer the children, the fewer people would share inheritances, which would exacerbate inequality (Stiglitz, 1969; Atkinson and Harrison, 1978). The empirical study of Elinder *et al*. (2018) also discussed similar issues. Therefore, we believe that China's one-child policy has reduced the birth rate and produced a large number of one-child families, which has made parental wealth transfer (including inheritance) more concentrated. This may increase wealth inequality.

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